Chapter 17

The Economics of Information

Chapter Summary

You learned in Chapters 11 through 15 how firms determine the prices of the goods and services they sell in different types of markets. Some firms face special challenges when they set their prices due to a lack of information. Insurance companies, for example, have difficulty in pricing insurance policies because of **asymmetric information**, which happens when one party to a transaction has less information than the other party. Asymmetric information is present in the market for used cars because if someone is selling you a used car, that person has more information about the car than do you. Asymmetric information leads to **adverse selection**, which occurs when one party to a transaction takes advantage of knowing more than the other party. The insurance industry is also subject to **moral hazard**, which is the tendency of people to change their actions because they have insurance. For example, if you have insurance for your laptop or iPod, you may reduce your care of those objects. Insurance companies use deductibles and co-payments to reduce moral hazard.

Adverse selection and moral hazard also affect firms and investors in financial markets. When a firm has sold stocks and bonds, it may spend the funds in ways not in the owners' best interests. Moral hazard can also be present in labor markets. Once hired, workers may shirk their obligations and not work hard. Firms deal with this form of moral hazard by closely monitoring workers and making their jobs seem more valuable than other jobs.

Information problems can occur in auctions. In some auctions, neither the bidder nor the seller has complete information about what is being auctioned. One possible outcome of auctions, the **winner's curse**, occurs when the winning bidder overestimates the value of the item and ends up worse off than the losers.

Learning Objectives

When you finish this chapter, you should be able to:

1. **Define asymmetric information and distinguish between adverse selection and moral hazard**. Asymmetric information occurs when one party to an economic transaction has less information than the other party. Adverse selection refers to a situation in which one party to a transaction takes advantage of having more information than the other party. Moral hazard occurs when people change their actions as a result of having insurance.

2. **Apply the concepts of adverse selection and moral hazard to financial markets**. Asymmetric information exists in financial markets because firms know more about their financial situation than potential buyers of the firms' stocks and bonds. Moral hazard exists in financial markets because firms may use funds raised through the sale of stocks and bonds to reduce profits. The larger the firm and the more carefully analysts follow the firm's activities, the less likely moral hazard will be a problem.

3. **Apply the concepts of adverse selection and moral hazard to labor markets.** Workers have more information about their work ethic than their employers. After workers are hired they may shirk their obligations and not work hard.

4. **Explain the winner's curse and why it occurs.** The winner's curse refers to the tendency in certain auctions for winning bidders to overstate the value of the good they bid on. In competitive bidding, winning bidders are those that are most optimistic about the value of the item on which they bid. The average bid is often closer to the actual value of the item.

Chapter Review

Chapter Opener: Why Does State Farm Charge Young Men So Much More Than Young Women for Auto Insurance? (pages 574-575)

State Farm Insurance charges different prices for automobile insurance based on a driver's gender, age, and other factors. State Farm and other insurance companies attempt to match the prices they charge with the costs they are likely to incur on each policy. Many insurance companies use sophisticated computer models to predict the chance that a driver will have an accident. As a result, in recent years there has been an increase in the variety of prices insurance companies charge drivers.

Helpful Study Hint

An ***Inside Look*** explains how insurance companies use the credit reports of their customers as one factor in determining premiums, a procedure that has been criticized by some consumer groups. Complete related end-of-chapter problem 1.13 to test your understanding of the chapter opener.

Economics in YOUR Life! asks you to assume you are in the market for a used car and can choose between buying from a local dealer or an individual seller. Would you be willing to pay the same price for an apparently identical car from either seller? Think about your answer before you read what the textbook authors suggest you might do at the end of this chapter.

17.1 LEARNING OBJECTIVE

17.1 Asymmetric Information (pages 576-580)

Learning Objective 1 Define asymmetric information and distinguish between adverse selection and moral hazard.

The difficulty in correctly pricing insurance policies arises from asymmetric information. **Asymmetric information** is a situation in which one party to an economic transaction has less information than the other party. For example, if someone drinks, smokes, doesn't sleep well, and has heart disease in his or her family, a health insurance company does not necessarily have that information when pricing a policy. Guarding against the effects of asymmetric information is a major objective of sellers in the insurance market and of buyers in financial markets.

The study of asymmetric information began with the study of used car markets or the market for "lemons." Sellers of used cars have more information about the cars they sell than do buyers. Most used cars offered for sale will be lemons. This is due to adverse selection. **Adverse selection** is a situation in which one party to a transaction (for example, a used car dealer) takes advantage of knowing more than the other party to the transaction (for example, the car buyer). Used car dealers can take steps to assure buyers they are not selling lemons by offering warranties that guarantee repair or replacement over a certain time period. Sellers can also build a reputation for selling reliable cars.

Buyers of insurance will always know more than insurance companies about the likelihood of the event being insured against happening. For example, people with bad health habits and histories of health problems will have a better idea of the probability that they will suffer a heart attack or other health problem than will insurance companies. Insurance companies cover their costs only if they set the prices (premiums) of their policies at levels that represent how many payment claims the people they have insured are likely to submit. The adverse selection problem can be reduced if people are automatically covered by insurance. For example, state governments require drivers to have automobile insurance. Adverse selection problems can also be reduced by offering group coverage to large companies and other organizations.

The insurance market is also subject to moral hazard. **Moral hazard** is the tendency of people who have insurance to change their actions because of the insurance or, more broadly, actions taken by one party to a transaction that are different from what the other party expected at the time of the transaction. An example of moral hazard is a firm that has taken out fire insurance may be less careful about avoiding fire hazards. Insurance companies use deductibles and co-payments to reduce moral hazard.

Helpful Study Hint

Making the Connection on pages 578-580 explains why some people do not have health insurance:

1. Some healthy young adults between the ages of 18 and 24 don't expect to need medical care and so do not want to pay the monthly premiums to buy insurance they don't expect to need. Because of adverse selection, some insurance companies charge higher prices to young, healthy people than they are willing to pay.
2. Many low-income people qualify for government health insurance through the Medicaid program. But some of these do not take advantage of the program or are not eligible.

Don't Let This Happen to YOU! on page 580 explains how you can understand the difference between adverse selection and moral hazard:

- Adverse selection happens at the time you enter into the transaction. Example: You sell your roommate a computer that crashes on you every three or four weeks.
- Moral hazard refers to what happens after you enter into the transaction. Example: You get insurance for your apartment and are less careful about locking the door when you leave in the morning.

Work through related end-of-chapter problems 1.11, 1.12, and 1.14 to understand the concepts referred to in these features.

Extra Solved Problem **17-1**

Chapter 17 includes two Solved Problems. Here is an extra Solved Problem to help you build your skills solving economic problems.

Supports Learning Objective 1: Define asymmetric information and distinguish between moral hazard and adverse selection.

The Nub of the Matter (Warning - Content may be unsuitable for sensitive readers!)

Although most people with health and life insurance are honest, insurance companies are always subject to the problem of adverse selection. Some people change their behavior as a result of having insurance. Among the most conspicuous examples of behavioral change are those involving people who lie about their circumstances or take deliberate actions that endanger their health. There are reported cases of self-mutilation in order to collect on disability insurance. Perhaps the most bizarre story concerns a town in Florida that acquired the macabre nickname of "Nub City" in the 1970s.

> Over 50 people in the town have suffered "accidents" involving the loss of various organs and appendages, and claims of up to $300,000 have been paid out by insurers. Their investigators are positive the maimings are self-inflicted; many witnesses to the "accidents" are prior claimants or relatives of the victims, and one investigator notes that "somehow they always shoot off parts they seem to need least."

Another type of moral hazard involves staging automobile accidents. The following is a brief description of how this is done.

> *How do I get started?* For a "paper accident" try inflicting "controlled damage" on a couple of cars with a sledgehammer in a dark parking lot. Insert passengers. Summon a witness. Gather broken glass in bags for re-use.
>
> *That was easy, what next?* "Staged" accidents: Buy rustbuckets, insure one and run it into another one full of recruited claimants-to-be ("cows"). If you're nice, give them pillows...
>
> *How do I keep from getting caught?* Vary your fact patterns. Don't stamp a doctor's name on medical reports months after he's died. Don't lose your ledger – needed to keep hundreds of accidents straight – or your scripts and tip sheets.

Sources: "Moral Hazard and Adverse Selection." *http://ingrimayne.saintjoe.edu/econ/RiskExclusion/Risk.html*
Walter Olsen, "New Trends in Highway Robbery," *Wall Street Journal*, December 20, 1996.

a. Use the two passages above to describe asymmetric information.

b. Use the two passages to distinguish adverse selection and moral hazard.

SOLVING THE PROBLEM

Step 1: Review the chapter material.
This problem is about asymmetric information, so you may want to review the section "Asymmetric Information," which begins on page 576 of the textbook.

Step 2: Answer question (a) by defining asymmetric information.
Asymmetric information is a situation in which one party to an economic transaction has less information than the other party. Those who are insured obviously have more knowledge of their circumstances than the companies that insure them.

Step 3: Answer question (b) by explaining the difference between adverse selection and moral hazard.
Adverse selection occurs when people take advantage of knowing more about their circumstances than the insurance companies do. This is the case with those who are alleged to commit insurance fraud. The guilty parties demonstrate moral hazard, which is the tendency for insurance to alter behavior. The possibility of collecting on an insurance policy is the motivation for self-mutilation and staging phony automobile accidents.

17.2 LEARNING OBJECTIVE

17.2 Adverse Selection and Moral Hazard in Financial Markets (pages 581-583)

Learning Objective 2 Apply the concepts of adverse selection and moral hazard to financial markets.

Adverse selection and moral hazard pose problems for the managers of firms and for their owners. Because firms know more about their financial situations than stockholders, the firm can use the funds in ways that reduce profits. For example, a firm that has no debt on its balance sheet may suddenly issue a large quantity of bonds. This increases the risk to current owners of their stock.

Congress created the Securities and Exchange Commission (SEC) in 1934 to regulate the stock and bond markets. The SEC requires firms to register stocks and bonds they wish to sell, increasing the amount of information available to investors.

Helpful Study Hint

This section's ***Making the Connection*** on page 582 uses moral hazard to explain the accounting scandals of 2002. These scandals led to Congress and the President passing the Sarbanes-Oxley Act, which aimed at making future scandals less likely and restoring investor confidence in financial markets. Two key parts of this Act are that

1. A government board now oversees the auditing of financial statements and has authority to take legal action against auditors who fail to ensure the accuracy of corporate financial statements.
2. Chief executive officers are responsible for certifying financial statements and are subject to prison sentences for violating the Sarbanes-Oxley Act.

Work through related end-of-chapter problem 2.7 to check your understanding of moral hazard in financial markets.

Extra Solved Problem 17-2

Chapter 17 includes two Solved Problems. Here is an extra Solved Problem to help you build your skills solving economic problems.

Supports Learning Objective 2: Apply the concepts of adverse selection and moral hazard to financial markets.

The Fall of the House of Rigas

In early 2002, a large firm unveiled plans for a new corporate headquarters in downtown Buffalo, New York. The $125 million project would house 1,000 workers and serve as a catalyst for other development efforts in the city's Inner Harbor area. James Allen, executive director of the Amherst and Erie County Industrial Development Agencies commented, "We need a signature project on the waterfront and this gives us that project." Unfortunately, the building project was proposed by Adelphia Communications. On June 24th of that same year Adelphia filed for bankruptcy. On June 20, 2005, a court sentenced John Rigas, Adelphia's founder and longtime CEO, to 15 years in jail for looting the company's finances and concealing over $2 billion in debt from investors. Rigas' son Timothy received a 20-year sentence after being convicted on the same charges as his father: conspiracy, bank fraud and securities fraud. During the Rigas trial, U.S. attorneys accused the Rigases of using Adelphia as a "private piggy bank" to pay for such personal expenses as millions of dollars in cash advances, $13 million to build a golf course, and even 100 pairs of bedroom slippers. The elder Rigas had even used a company jet to send a Christmas tree to his daughter in New York City. When he found out the tree was the wrong size, he had another tree sent – at company expense.

Despite being a publicly held firm, Adelphia was run like a family business. John Rigas and three of his sons and one son-in-law held five of the nine seats on the company's board of directors. The family's mismanagement was hidden from investors through fraudulent financial statements. After the collapse of Internet stock prices following a rapid climb in the 1990s and the slowdown of the overall U.S. economy in 2001, investors began looking more closely at questionable managerial and accounting practices that made debt-ridden firms such as Adelphia and Enron appear in better financial condition than they actually were.

Sources: James Fink, "Adelphia Picks HOK for Downtown Office Design," *Buffalo Business First*, January 16, 2002. James Fink, "John Rigas Sentenced to 15 Years in Prison," *Buffalo Business First*, June 21, 2005.
"Rigases Looted Adelphia, Jurors Told" http://www.smh.com.au/articles/2004/03/02/1078191325849.html

a. What characteristic of Adelphia Communications' management structure demonstrates adverse selection?

b. Use the actions of the Rigas family to illustrate the consequences of moral hazard in financial markets.

SOLVING THE PROBLEM

Step 1: Review the chapter material.
This problem is about adverse selection and moral hazard, so you may want to review the section "Adverse Selection and Moral Hazard in Financial Markets," which begins on page 581 of the textbook.

Step 2: Answer question (a) by discussing Adelphia Communications' management structure.
The strong overall performance of the U.S. economy and U.S. financial markets masked the fraudulent behavior of the Rigases during the 1990s. Perhaps the most important characteristic of the company's management structure was that Rigas family members held a majority of the seats on Adelphia's board of directors. This meant that the family had effective control over the company and could prevent other board members from overruling questionable practices.

Step 3: Answer question (b) by discussing the consequences of moral hazard in financial markets.
It is critically important for investors and analysts to have access to timely and accurate information regarding a publicly-owned company. Had the true financial condition of the company been known earlier, the financial markets would have penalized Adelphia with lower stock prices. The company could have been forced to change the composition of the board of directors or to be sold to another company.

17.3 LEARNING OBJECTIVE

17.3 Adverse Selection and Moral Hazard in Labor Markets (pages 583-584)

Learning Objective 3 Apply the concepts of adverse selection and moral hazard to labor markets.

Economists refer to the conflict between the interests of shareholders and the interests of top management as a principal-agent problem. The **principal-agent problem** is caused by an agent pursuing his own interests rather than the interests of the principal who hired him. In labor markets, this problem arises because workers may shirk their obligations and not work hard.

Firms may reduce shirking through close monitoring of workers or by making a worker's job seem more valuable. Firms may pay efficiency wages, which are higher-than-equilibrium wages used to give workers an incentive to work harder.

A seniority system that rewards workers who have been with the firm longer with higher pay and other benefits may also reduce shirking. Profit sharing provides workers with a share of the firm's profits; the harder the employee works, the more profit the firm earns and the higher the employee's income. But this may not work well in large firms where there is only a slight connection between an individual worker's effort and the firm's profitability.

Helpful Study Hint

Read ***Solved Problem 17-3*** to understand how changes in a firm's compensation system can reduce moral hazard. Working through end-of-chapter problem 3.4 will further increase your understanding of this topic.

17.4 LEARNING OBJECTIVE

17.4 The Winner's Curse: When Is It Bad to Win an Auction? (pages 585-589)

Learning Objective 4 Explain the winner's curse and why it occurs.

In some auctions, neither the bidder nor the seller has complete information about what is being auctioned. The **winner's curse** is the idea that the winner in certain auctions may overestimate the value of the good, thus ending up worse off than the losers. When there is uncertainty regarding the value of the item auctioned, the average competitive bid is likely to be close to the true value. The winning bid in an auction will be one that is most optimistic and, therefore, greater than the true value. The winner's curse applies to auctions of common-value assets that would be given the same value by bidders if they had perfect information. The winner's curse does not apply to auctions of private-value assets when the value to each bidder depends on the bidder's own preferences.

Helpful Study Hint

You've probably heard statistics that about 40 percent of marriages end in divorce. The ***Making the Connection*** on page 586 of the textbook suggests that the winner's curse can explain why marriages often end in divorce: Some people overestimate another person's value as a spouse. The ***Making the Connection*** on page 588 describes another example of the winner's curse through a classroom experiment. ***Solved Problem 17-4*** further explores the winner's curse using an auction of Alaskan oil fields. Working through end-of-chapter problems 4.5, 4.7 and 4.10 will increase your understanding of this material.

Key Terms

Adverse selection. The situation in which one party to a transaction takes advantage of knowing more than the other party to the transaction.

Asymmetric information. A situation in which one party to an economic transaction has less information than the other party.

Moral hazard. The actions people take after they have entered a transaction that make the other party to transaction worse off.

Principal-agent problem. A problem caused by agents pursuing their own interests rather than the interests of the principal who hired them.

Winner's curse. The idea that the winner in certain auctions may have overestimated the value of the good, thus ending up worse off than the losers.

Self-Test

(Answers are provided at the end of the Self-Test.)

Multiple-Choice Questions

1. What is the reason for the existence of *asymmetric information*?
   a. Asymmetric information exists when people who have insurance change their actions because of the insurance.
   b. Asymmetric information exists when one party to an economic transaction has less information than the other party.
   c. Asymmetric information exists when parties to an economic transaction must pay different prices to obtain the same information.
   d. Asymmetric information exists when adverse selection leads to moral hazard.

2. Fill in the blanks: Guarding against the effects of asymmetric information is a major objective of __________ in the insurance market and __________ in financial markets.
   a. buyers; sellers
   b. sellers; buyers
   c. buyers; buyers
   d. sellers; sellers

3. If potential buyers have difficulty separating lemons from good used cars, what will they do?
   a. They will take this into account in the prices they are willing to pay.
   b. They will not take this into account in the prices they are willing to pay.
   c. They will be absolutely indifferent between cars, and will pay the same price for either type of car.
   d. They will pay a price for a car that is always too high.

4. When adverse selection exists in the used car market, which of the following will prevail?
   a. Buyers will generally offer a very high price, closer to the price of a good car.
   b. Buyers will generally offer a very low price, closer to the price of a lemon.
   c. Buyers will generally offer a price somewhere between the price they would be willing to pay for a good car and the price they would be willing to pay for a lemon.
   d. All buyers will end up buying a car.

5. Suppose that half of used cars offered for sale are reliable and half are unreliable. If potential buyers are willing to pay $5,000 for a reliable car, but only $2,500 for an unreliable one, how much will buyers offer for a car?
   a. $2,500
   b. $3,750
   c. $5,000
   d. $4,999

6. When uninformed buyers are willing to pay a price for used cars that is the average of the value of a lemon and the value of a good used car, which of the following will occur?
   a. Most used cars offered for sale will be lemons.
   b. Most used cars offered for sale will not be lemons.
   c. The quantity supplied of lemons will be identical to the quantity supplied of good used cars.
   d. Only good used cars will be offered for sale.

7. What is the impact of *adverse selection* on economic efficiency in a market?
   a. Adverse selection will increase economic efficiency.
   b. Adverse selection will reduce economic efficiency.
   c. Adverse selection does not have any impact on economic efficiency in a market.
   d. Consumer wants will shift toward the goods left in the market.

8. Which of the following is a way of reducing adverse selection in the car market?
   a. Providing manufacturer warranties
   b. Providing dealer warranties
   c. Building a good reputation
   d. All of the above

9. Which of the following is true about *lemon laws*?
   a. Lemon laws require a full refund if a new car needs several major repairs within the first two years.
   b. Car manufacturers have actually supported lemon laws.
   c. Most states today have enacted lemon laws and strictly enforce them.
   d. All of the above

10. Asymmetric information problems are particularly severe in the market for insurance. This is true because
    a. insurance companies will always know more about the likelihood of an event happening than will buyers of insurance.
    b. buyers of insurance will always know more about the likelihood of an event happening than will insurance companies.
    c. insurance companies and buyers of insurance cannot distinguish between good and bad information.
    d. insurance companies are non-depository financial institutions.

11. Which of the following groups tends to worsen the problem of adverse selection?
    a. Good drivers
    b. Sick people
    c. People living in houses made entirely of rock
    d. All of the above

12. Which of the following makes the adverse selection problem in the health insurance market worse?
    a. Charging high premiums for insurance coverage
    b. Refusing to offer insurance policies to certain people
    c. Requesting a medical examination for new applicants
    d. All of the above

13. How can insurance companies reduce adverse selection?
    a. By offering policies mostly to individuals rather than groups of people
    b. By offering group coverage rather than individual coverage
    c. By *not* requiring that every patient buy health insurance
    d. By increasing the price of participation in the health insurance program

14. When is it easier for insurance companies to estimate the average number of claims likely to be filed?
    a. When they offer policies to individuals, not groups
    b. When they offer group coverage rather than individual coverage
    c. When they insure small groups rather than large groups
    d. When they reduce the number of participants so as to deal with a small rather than large number of customers

15. Insurance companies can reduce the problems that arise from adverse selection by offering group coverage to large firms. Group coverage is an example of
    a. risk abatement.
    b. risk aversion.
    c. risk pooling.
    d. hazard reduction.

16. Which of the following is a consequence of the adverse selection problems insurance companies face?
    a. Insurance companies charge young women higher prices for automobile insurance than they charge young men.
    b. Insurance companies sometimes refuse to offer health insurance to people with chronic illnesses.
    c. Insurance companies sometimes refuse to offer group insurance to large companies because there are too many insured people to accurately price this insurance.
    d. The equilibrium quantity of health insurance is greater that it would be in the absence of adverse selection.

17. Which of the following is true about adverse selection and moral hazard?
    a. Adverse selection is a consequence of asymmetric information; asymmetric information is a consequence of moral hazard.
    b. Insurance companies can eliminate adverse selection by charging deductibles and co-insurance, but charging deductibles and co-insurance increases the risk of moral hazard.
    c. Adverse selection only affects the market for automobile insurance; moral hazard only affects the markets for health and life insurance.
    d. Adverse selection refers to what happens at the time of entering into a transaction; moral hazard refers to what happens after entering into a transaction.

18. Match one of the terms below to the following definition: Actions taken by one party to a transaction that are different from what the other party expected at the time of the transaction.
    a. Adverse selection
    b. Moral hazard
    c. The Coase Theorem
    d. Winner’s curse

19. Which of the following actions is an attempt by a fire insurance company to reduce *moral hazard*?
    a. Requiring a warehouse to install a sprinkler system
    b. Reserving the right to inspect the warehouse for fire hazards
    c. Establish a system of deductibles and co-payments
    d. All of the above

20. Which of the following refers to a system in which the insurance company pays only a percentage of any claim, not a certain dollar amount?
    a. A deductible
    b. A co-payment
    c. Both deductibles and co-payments
    d. Neither deductibles nor co-payments

21. Fill in the blanks: There are two consequences of asymmetric information. _________________ refers to what happens *at the time* of entering a transaction, while _________________ refers to what happens *after* entering into the transaction.
    a. Adverse selection; moral hazard
    b. Moral hazard; adverse selection
    c. Imperfect information; economic inefficiency
    d. Voluntary exchange; involuntary participation

22. If your medical insurance policy has a $100 deductible and a 10 percent co-payment, how much will you pay on a medical bill of $1,000?
    a. $100
    b. $900
    c. $110
    d. $190

23. What is the effect of adopting deductibles and co-payments for all holders of insurance policies?
    a. Holders will have an incentive to file more claims.
    b. Holders will have an incentive to avoid filing claims.
    c. The moral hazard problem in the insurance market will be greater.
    d. The adverse selection problem in the insurance market will be greater.

24. When will potential investors be reluctant to buy the stocks and bonds of particular companies?
    a. When the firm knows more about its financial situation than does the potential investor
    b. When a great deal of public information is available about the firm
    c. When asymmetric information is absent
    d. All of the above

25. Which firms have an easier time selling stocks and bonds to potential investors?
    a. Firms that are studied closely by investment analysts
    b. Small corporations rather than large corporations
    c. Firms for which little public information is made available
    d. All of the above

26. If the managers of a corporation use funds in ways that actually reduce profits, which of the following problems is present?
    a. Diminishing returns to labor
    b. Moral hazard
    c. Adverse selection
    d. The winner's curse

27. Fill in the blanks: The _________ the firm is and the more carefully investment analysts follow its activities, the _________ likely moral hazard is to be a problem.
    a. larger; more
    b. smaller; less
    c. larger; less
    d. smaller; more

28. Which agency was established by Congress in 1934 to regulate the stock and bond markets?
    a. The Federal Reserve System
    b. The Federal Trade Commission
    c. The Commerce Department
    d. The Securities and Exchange Commission

29. What did the creation of the Securities and Exchange Commission do for financial markets?
    a. It made the problems of adverse selection and moral hazard worse, and reduced the number of firms that could raise funds by selling stocks and bonds.
    b. It helped reduce adverse selection and moral hazard and increased the number of firms that could raise funds by selling stocks and bonds.
    c. It helped reduce adverse selection and moral hazard, but decreased the number of firms that could raise funds by selling stocks and bonds.
    d. It increased adverse selection and moral hazard but also increased the number of firms that could raise funds by selling stocks and bonds.

30. Which of the following financial statements reports the profits of a firm over a period of time?
    a. The balance sheet
    b. The income statement
    c. The prospectus
    d. The audit

31. The news that Enron and other firms had "cooked the books" is an example of which of the following?
    a. Adverse selection
    b. Moral hazard
    c. The winner's curse
    d. Profit sharing

32. What was the objective of the Sarbanes-Oxley Act of 2002?
    a. To reduce the number of factors that can affect a firm's profits
    b. To eliminate the auditing of corporations by independent accounting firms
    c. To prevent chief executive officers from serving prison terms for financial crimes
    d. To restore confidence in the financial system and strengthen the country's security laws

33. Which of the following are provisions of the Sarbanes-Oxley Act of 2002?
    a. To establish a government board to oversee the auditing of financial statements
    b. To increase prison terms for violating securities laws
    c. To require chief executives and chief financial officers to personally certify the accuracy of financial statements
    d. All of the above

34. What is the term given to the problem caused by an agent pursuing his own interests rather than the interests of the principal who hired him?
    a. The principal-agent problem
    b. Adverse selection
    c. The capture theory of regulation
    d. Organizational misbehavior

35. Which of the following is most closely associated with the term "shirking"?
    a. Making an effort to report accurate information on financial statements.
    b. The possibility that a worker may be hired at a wage that is higher than the equilibrium wage in a given labor market.
    c. The possibility that workers, once hired, may not work as hard as anticipated.
    d. Actions by managers and workers designed to reduce the risk of being fired.

36. What is an *efficiency wage*?
    a. A wage designed to give workers an incentive to work harder
    b. Any minimum wage is an efficiency wage
    c. A wage usually below the equilibrium wage
    d. All of the above

37. Which of the following compensation schemes would reduce moral hazard among salespeople?
    a. Compensation based on a straight salary without commission
    b. Compensation that depends on how much workers sell, such as straight commission
    c. Compensation based on a set fee for services rendered rather than an hourly salary or commission
    d. None of the above

38. What is the idea behind the *winner's curse*?
    a. The act of winning a good in a certain auction may cause the bidder to build too much confidence and end up overbidding in subsequent auctions.
    b. In certain auctions, the winner may have overestimated the value of the good, and so ended up worse off than the losers.
    c. In certain auctions, the winner may have underestimated the value of the good, and so ended up far better off than the losers.
    d. Bad luck usually strikes those who win an auction.

39. In an auction for a common-value asset, if there are seven bids (in millions) of \$32, \$18, \$11, \$8, \$6, \$4, and \$3, respectively, what is the most likely value of the asset?
    a. Close to \$32
    b. Close to \$3
    c. Close to \$12
    d. None of the above; there is insufficient information to answer the question.

40. In which of the following auctions is the *winner's curse* most applicable?
    a. In auctions of private-value assets
    b. In auctions where the value to each bidder depends on the bidder's own preferences
    c. In auctions of common-value assets, such as oil fields
    d. In auctions where bidders place different bids even when they have perfect information

Short Answer Questions

1. Most colleges and universities have a tenure system for their faculty. After faculty members have been granted tenure, they receive a degree of employment security rare among other professions. One reason for the tenure system is that it promotes academic freedom. With tenure, a faculty member need not worry about being dismissed for stating controversial beliefs in his or her classroom. Does the tenure system also result in moral hazard? Explain your answer.

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2. The ***Making the Connection*** on page 586 of the textbook noted that over 40 percent of marriages in the United States end in divorce. The high rate of divorce may be evidence of a winner's curse in the so-called *marriage market*. If divorce were banned in the United States, would this result in a lower percentage of people who are dissatisfied with their marriages?

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3. In 2007, the baseball Barry Bonds hit for his record-breaking 756th home run was auctioned. The winning bid was over $750,000. Does the "winner's curse" explain why the auction resulted in such a high winning bid for this baseball?

4. Many fast-food restaurants pay their workers no more than the national minimum wage ($5.85 in 2007, with increases scheduled for 2008 and 2009), but some pay *more* than the minimum wage. Are these above-minimum wages also efficiency wages? Explain your answer.

5. Each academic term, a large number of students decide to take principles of economics courses. Most universities offer several sections of these courses. Explain how asymmetric information influences a student's decision about which principles of economics section to enroll in.

True/False Questions

T F 1. Adverse selection causes many used cars offered for sale to be "lemons" and reduces the total quantity of used cars sold.
T F 2. The "lemon laws" passed by most states include a provision that car manufacturers must indicate whether a used car they offer for sale was repurchased from the original owner as a lemon.
T F 3. Michael Spence began the study of asymmetric information with an analysis of the market for used cars.
T F 4. The Securities and Exchange Commission requires firms to take actions that reduce the problems associated with adverse selection and moral hazard in financial markets.
T F 5. Equilibrium wages paid to workers that reflect their marginal revenue products are called efficiency wages.
T F 6. The accounting scandals of 2002, involving Enron, WorldCom, and Adelphia Communications, are examples of moral hazard.
T F 7. Insurance companies can reduce problems caused by adverse selection by offering group coverage to large firms.
T F 8. A warehouse owner who purchases a fire insurance policy may become less careful about reducing potential fire hazards in his warehouse. This is an example of adverse selection.
T F 9. Pacific Telesis used economic reasoning and a knowledge of the winner's curse to successfully bid on licenses that allowed it to operate a wireless communication network.
T F 10. A firm can use a seniority system for its workers to reduce the incidence of moral hazard.
T F 11. A *co-payment* requires the holder of an insurance policy to pay a certain dollar amount of a claim.
T F 12. One reason for the Enron and WorldCom accounting scandals of 2002 was that their financial statements were audited by accountants employed by these firms.
T F 13. Profit-sharing typically does not overcome the risk of moral hazard on the part of employees because profits are affected by many factors that are unrelated to how hard a particular employee works.
T F 14. The winner's curse applies only to auctions of private-value assets.
T F 15. Lemon laws apply to both new and used car markets.

Answers to the Self-Test

Multiple-Choice Questions

Question	Response	Explanation
1	b	Asymmetric information is a situation where one party to an economic transaction has less information than the other party.
2	b	Guarding against the effects of asymmetric information is a major objective of sellers in the insurance market, and of buyers in financial markets. But it was in the market for used automobiles that economists first began to carefully study the problem of asymmetric information.
3	a	If potential buyers of used cars know that they will have difficulty separating the good used cars from the bad used cars, or "lemons," they will take this into account in the prices they are willing to pay.
4	c	When adverse selection in the used car market exists, buyers will generally offer a price somewhere between the price they would be willing to pay for a good car and the price they would be willing to pay for a lemon.

5	b	This price is halfway between the price they would pay if they knew for certain the car was a good one and the price they would pay if they knew it was a lemon.
6	a	To sellers of lemons, an offer of the average price is above the true value of the car and they will be quite happy to sell. As sellers of lemons take advantage of knowing more about the cars they are selling than buyers do, the used car market will fall victim to adverse selection: most used cars offered for sale will be lemons.
7	b	Adverse selection reduces the total quantity of used cars bought and sold in the market because few good cars are offered for sale. As a result, we can conclude that information problems reduce economic efficiency in a market.
8	d	All of the above are suggested ways of reducing adverse selection in the car market.
9	a	Most lemon laws have two main provisions. One is that new cars that need several major repairs during the first year or two after the date of original purchase may be returned to the manufacturer for a full refund. The other is that car manufacturers must indicate whether a used car they are offering for sale was repurchased from the original owner as a lemon. Although popular with consumers, opposition from manufacturers has resulted in lemon laws being enacted in fewer than 20 states. Enforcement has also been spotty.
10	b	Asymmetric information problems are particularly severe in the market for insurance. Buyers of insurance policies will always know more about the likelihood of the event being insured against happening than will insurance companies.
11	b	The adverse selection problem arises because sick people are more likely to want medical insurance than healthy people, reckless drivers are more likely to want automobile insurance than careful drivers, and people living in homes that are fire hazards are more likely to want fire insurance than people living in safe homes.
12	a	Insurance companies are reluctant to charge higher premiums because it increases the likelihood that only people who are almost certain to make a claim will purchase a policy.
13	b	Insurance companies can reduce adverse selection problems by offering group coverage. Everyone employed by a firm with group coverage is insured. If the group is large enough, coverage is likely to represent the proportions of healthy and unhealthy people in the general population.
14	b	As long as the group is large enough, it is likely to represent the proportions of healthy and unhealthy people found in the general population. That makes it easier for insurance companies to estimate the average number of claims likely to be filed under a group medical insurance or life insurance policy, than it would be to predict the number of claims likely to be filed under an individual policy.
15	c	See the section "Reducing Adverse Selection in the Insurance Market" beginning on page 577.
16	b	See the ***Making the Connection*** on pages 578-580.
17	d	See the ***Don't Let This Happen to YOU!*** on page 580.
18	b	Moral hazard is the tendency of people who have insurance to change their actions because of the insurance, or, more broadly, actions people take after they have entered into a transaction that make the other party to the transaction worse off.
19	d	Insurance companies can take steps to reduce moral hazard problems. For example, a fire insurance company may insist that a firm install a sprinkler system in a warehouse in order to offset any increased carelessness once the policy is in place. Or it may reserve the right to inspect the warehouse periodically to check for fire hazards. Insurance companies also use deductibles and co-payments to reduce moral hazard.

20	b	A deductible requires the holder of the insurance policy to pay a certain dollar amount of a claim. With a co-payment, the insurance company pays only a percentage of any claim.
21	a	Adverse selection refers to what happens at the time the transaction is entered into. Moral hazard refers to what happens after the transaction has been entered into.
22	d	If you have a medical insurance policy with a $100 deductible and a 10 percent co-payment and you have a medical bill of $1,000. You must pay the first $100 of the bill and 10 percent of the other $900, or $100 + $90 = $190.00.
23	b	Deductibles and co-payments give the holders of the insurance policy an incentive to avoid filing claims.
24	a	Asymmetric information is a key reason why only large corporations are able to raise funds by selling stocks and bonds. Every firm knows more about its financial situation than does any potential investor. Because investors have trouble distinguishing between well-run firms and poorly-run firms, they are reluctant to buy the stocks and bonds of companies unless there is a great deal of public information available about these companies.
25	a	Because investors have trouble distinguishing between well-run firms and poorly-run firms, they are reluctant to buy the stocks and bonds of companies unless there is a great deal of public information available about these companies. In practice, this means that unless firms are studied closely by investment analysts working for brokerage firms and investment companies, firms will have difficulty selling stocks and bonds to investors.
26	b	Investors are worried about moral hazard. Once a firm has sold stocks and bonds, the possibility exists that the company will use the funds in ways that reduce profits.
27	c	The larger the firm is and the more carefully investment analysts follow its activities, the less likely moral hazard is to be a problem. This is a reason why investors will be willing to buy the stocks and bonds of large firms, but not of small firms.
28	d	When firms failed to provide investors with clear information about their true financial positions, Congress responded by establishing the Securities and Exchange Commission (SEC) in 1934 to regulate the stock and bond markets.
29	b	The SEC succeeded in increasing the amount of information available to potential investors. This helped reduce the adverse selection and moral hazard problems in financial markets and increased the number of firms that have been able to raise funds by selling stocks and bonds.
30	b	The basic information on the financial condition of a company is contained in its financial statements, particularly its income statement and balance sheet. A firm's income statement reports its profits over a period of time, and its balance sheet shows the net value of the firm, based on the value of everything it owns minus the value of everything it owes.
31	b	The news that Enron and other firms had "cooked the books" illustrates the difficulty that moral hazard poses for investors. The management of a firm knows far more about the firm's finances than any outside investor can.
32	d	To help restore confidence in financial statements, Congress passed and President George W. Bush signed into law the Sarbanes-Oxley Act to strengthen the country's securities laws. The bill authorized the SEC to set up a government board to oversee the auditing of financial statements.

33	d	The bill authorized the SEC to set up a government board to oversee the auditing of financial statements. The bill also requires chief executive officers and chief financial officers to personally certify the accuracy of financial statements. The maximum prison term for violating the securities laws was raised to 25 years.
34	a	The principal-agent problem is caused by an agent pursuing his own interests rather than the interests of the principal who hired him.
35	c	The moral hazard behind the principal-agent problem between the managers of a firm and its workers is that once hired, workers may shirk their obligations and not work hard.
36	a	An efficiency wage is a higher than equilibrium wage used by firms to give workers an incentive to work harder.
37	b	Compensation that depends on how much workers sell reduces the risk associated with moral hazard since workers will not get paid for shirking.
38	b	In an auction for a common-value asset, the winning bidder may overestimate the value of the good, and so end up worse off than the losing bidders.
39	c	Mistakes of sometimes being too high would tend to offset the mistakes of sometimes being too low, so the average estimate would be close to the asset's value. In this case, it is likely that the true value of the asset in the auction is about $11.7 million, or the average of the seven bids.
40	c	The winner's curse applies only to auctions of *common-value assets* – such as oil fields – that would be given the same value by all bidders if they had perfect information. The winner's curse does not apply to auctions of *private-value assets* where the value to each bidder depends on the bidder's own preferences.

Short Answer Responses

1. Some critics of the tenure system argue that moral hazard may be a by-product of granting tenure to members of a college's faculty. Prior to receiving tenure, faculty have strong incentives to demonstrate excellence in teaching and research, two criteria used to evaluate faculty performance. After tenure is granted, some faculty will not work as hard on their teaching and research unless they have other incentives to do so. (Most universities have an additional promotion step to full professor that gives tenured associate professors some additional incentive to demonstrate continued excellence in teaching and research.)

2. It is possible that some people would take longer to select a marriage partner – and may choose not to marry at all – if divorce were made illegal in the United States. But keep in mind that people often make mistakes when they make decisions (recall from Chapter 9 that one common mistake is that consumers are overly optimistic about their future behavior) so it is highly unlikely that banning divorce would lead to a large increase in the number of successful marriages. The law would make it more likely that people would remain in unhappy marriages (not necessarily a better outcome) and would certainly lead some people to seek divorces in other countries where the practice was legal. Such a law might also encourage extra-legal solutions to the problem of unhappy marriages.

3. Many people believe that paying such a high price for a baseball must leave the buyer worse off, but the winner's curse applies only to common-value assets that would be given the same value by all bidders if they had perfect information. This is not the case with the Barry Bonds baseball, assuming that the winning bid reflected the buyer's true preferences. The buyer had full and complete information about the product being sold. The exchange was voluntary. Therefore, no "winner's curse" resulted from this auction.

4. It is possible that an above-minimum wage is an equilibrium wage. An equilibrium wage is one that equates the quantity demanded with the quantity supplied in a given market. Some fast-food restaurants pay wages that exceed the minimum wage because they face competition from other employers who also pay more than the minimum wage. Other firms pay more than the minimum wage because local economic conditions make it impossible to hire enough workers for the minimum wage. This does not mean that some fast-food restaurants do not pay efficiency wages. The motive for doing so is not only to provide an incentive for workers to work harder and not shirk (as the textbook explains), but to reduce worker turnover. Many service firms have difficulty retaining workers. Retaining experienced workers reduces training costs and may result in better customer service.

5. Most colleges and universities offer a number of sections of principles of microeconomics and macroeconomics each academic term. Freshmen and transfer students as well as non-majors often have little information about the teaching styles and course requirements of the course instructors. Students who have taken other courses from these instructors and the instructors themselves provide some of this information through conversation, course syllabi and (increasingly) through web sites that summarize course content and students' opinions of the instructors whose courses they have taken.

True/False Answers

1. T See the section "Asymmetric Information" beginning on page 576 of the textbook.
2. F Another provision included in the laws is that new cars that need several major repairs during the first year or two after the original purchase date may be returned for a full refund.
3. F George Akerlof was the author of the study of asymmetric information in the market for used cars.
4. T See the section "Adverse Selection and Moral Hazard in Financial Markets" on pages 581-582. By requiring firms to register the stocks and bonds they wish to sell with the SEC and requiring each firm to provide potential investors with a prospectus, the problems associated with adverse selection and moral hazard are reduced.
5. F An efficiency wage is a greater-than-equilibrium wage paid to encourage workers to work harder.
6. T See the *Making the Connection* beginning on page 582.
7. T See the section "Asymmetric Information" beginning on page 576.
8. F This is an example of moral hazard, since the warehouse owner changed his actions as a result of obtaining fire insurance.
9. T Pacific Telesis paid less for licenses in Los Angeles than other companies paid for licenses in other cities. See the section "The Winner's Curse: When Is It Bad to Win an Auction?" beginning on page 585.
10. T A seniority system grants higher pay and other benefits to workers who have served with a firm for a long time.
11. F A *deductible* requires the holder of an insurance policy to pay a certain dollar amount of a claim.
12. F All firms that issue stock to the public have their statements audited by employees of accounting firms, not the firms whose statements they audit.
13. T See the section "Adverse Selection and Moral Hazard in Labor Markets" beginning on page 583.
14. F The winner's curse applies only to auctions of common value assets, not private-value assets.
15. T See the section "Asymmetric Information" beginning on page 576.