

# CHAPTER 4

## **SUPPLY AND DEMAND**

*Microeconomics in Context* (Goodwin, et al.), 2<sup>nd</sup> Edition

### **Chapter Overview**

In this chapter, you'll find the basics of supply and demand analysis. As you work through this chapter, you will start learning how to manipulate supply and demand curves as a way to analyze the relationships among prices, volume of production, and other factors. You will learn about the various factors that can shift a supply or demand curve up or down, the concepts of equilibrium and market adjustment, and the signaling and rationing functions of prices.

### **Objectives**

After reading and reviewing this chapter, you should be able to:

1. Understand the uses of empirical, theoretical, and historical analysis.
2. Interpret supply and demand curves.
3. Understand the difference between a change in supply (demand) and a change in the quantity supplied (demanded).
4. List the non-price determinants of supply by businesses and demand by households.
5. Explain how price adjusts due to changes in supply and demand.
6. Understand topics of market analysis including signaling, rationing, scarcity, shortage, and inadequacy.
7. Appreciate the difference between the theory of supply and demand and the real world.
8. Describe the impacts of price floors and ceilings.

### **Key Terms**

empirical investigation  
theories

historical investigation

positive or direct relationship

individual supply

ceteris paribus

nonprice determinants of supply

effective demand

market demand

change in quantity demanded

derived demand

substitute good

surplus

market-clearing equilibrium

time series data

theoretical investigation

supply curve

market supply

change in quantity supplied

change in supply

demand curve

negative or inverse relationship

individual demand

change in demand

nonprice determinants of demand

complementary good

equilibrium

shortage

theory of market adjustment  
static model  
signaling function of markets and prices  
market incentives  
precise  
price floor  
cartel

market disequilibrium  
dynamic model  
rationing  
inadequacy  
accurate  
price ceiling

## Active Review

### *Fill in the Blank*

1. The observation and recording of specific happenings in the world is known as \_\_\_\_\_ investigation.
2. When we observe the changes in an economic variable over time, we are dealing with \_\_\_\_\_ data.
3. A curve indicating the quantities that buyers are willing to purchase at various prices is known as a(n) \_\_\_\_\_ curve.
4. Mark would like to buy a new car for \$20,000. However, he doesn't have any savings and he doesn't qualify for a loan. Thus, his desire for a car does not translate into \_\_\_\_\_ demand.
5. Tabitha needs furniture for her room. She is deciding between a medium-sized couch and a large armchair. Either the couch or the armchair could fulfill her need for sitting space in the room. The couch and the armchair can be referred to as \_\_\_\_\_ goods.
6. When people eat french fries, they like to put ketchup on them. Due to an increase in the price of french fries, total sales of french fries decrease. At the same time, ketchup sales also decrease. This phenomenon can be explained by noting that french fries and ketchup are \_\_\_\_\_ goods.
7. Surplus and shortage are both instances of \_\_\_\_\_.
8. A model that ignores time, implicitly assuming that all adjustments occur instantaneously, is known as a(n) \_\_\_\_\_ model.
9. In general, in a basic model showing supply and demand, if the supply curve shifts to the right, equilibrium price will \_\_\_\_\_ and equilibrium quantity supplied will \_\_\_\_\_.
10. Markets and market prices perform two important functions, signaling and \_\_\_\_\_.

11. Label the following examples as "shortage," "scarcity," or "inadequacy."

a. Scooters cost \$100 each. Ten people are willing to pay \$100 for a scooter, but due to a backup at the factory, only eight scooters are available for sale.  
\_\_\_\_\_

b. Ten people need a place to sleep. Hotel rooms cost \$50 per night. Five people have \$50 each, so they get rooms. The other five don't have \$50, so they spend the night on park benches. \_\_\_\_\_

c. Young-Ah would like to buy a movie ticket and a concert ticket, but only has enough money to buy one of them.

*True or False*

12. Supply curves are always generated empirically.

13. The price of limes could be a nonprice determinant of the supply of lemons.

14. The demand curve for a good shows the same information as the demand schedule.

15. Tastes and preferences act as nonprice determinants of demand.

16. In general, an increase in demand tends to increase equilibrium price and decrease equilibrium quantity.

*Short Answer*

17. There are ten restaurants in your town. On a given night, each restaurant has the ability to produce up to twenty full course dinners at a price of \$20 each. What is the total market supply of full course dinners tonight, at a price of \$20?

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18. Name five major nonprice determinants of supply, for a producing business.

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19. Why do demand curves generally slope downward?

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20. Suggest a possible exception to the "law of demand," in which people buy less of a good as its price increases.

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21. Explain the difference between a *change in quantity demanded* and a *change in demand*.

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22. State the difference between a static and dynamic model.

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23. Describe a possible case in which adjustment to equilibrium may take many years, or not happen at all.

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24. Describe the signaling and rationing functions of market prices.

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25. A new movie is released after having been heavily promoted to teenagers. On the first night, the tickets sell out and there are still teenagers waiting outside theaters, desperate to see the movie and unable to get a ticket. Is this market in equilibrium? Explain.

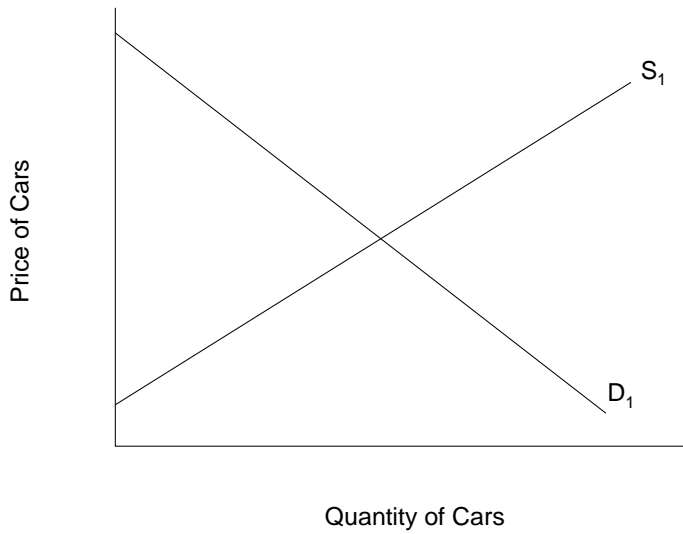
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**Problems**



1. For the following questions, refer to the graph shown above.

- a. Label the equilibrium point as  $E_1$ , the equilibrium quantity as  $Q_1$ , and the equilibrium price as  $P_1$ .
- b. Show how the supply curve will change if car manufacturers achieve a technological breakthrough that allows them to produce cars more cheaply.
- c. If the price stayed at  $P_1$ , would a surplus or a shortage result from the technological breakthrough described in part (b)? Answer in words, and show on the graph.

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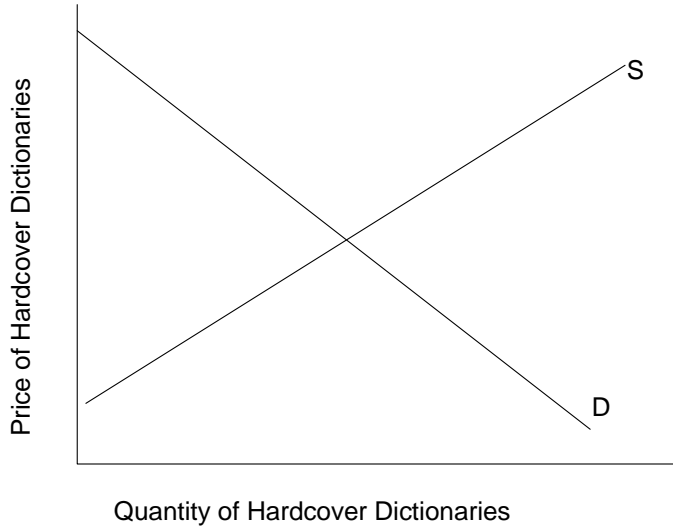
- d. Assuming market forces work quickly, show the new equilibrium price to which the market will adjust. Label this point as  $E_2$ . Label the new equilibrium quantity as  $Q_2$ , and the new equilibrium price as  $P_2$ .
- e. In words, summarize the information that you have shown in your adjustments to the graph in parts (a) through (d).

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2. The graph above shows supply and demand for hardcover unabridged English dictionaries. Suppose that a new dictionary resource is created on the Internet, decreasing people's interest in buying large dictionaries in book form. For the questions below, state the answer in words and, where relevant, diagram your answer.

- a. What happens to the demand curve for hardcover dictionaries, as a result of this Internet innovation? (Answer in words and diagram.)

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- b. What happens to the supply curve as a result of the Internet innovation? (Answer in words and diagram.)

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- c. What happens to the price of hardcover dictionaries as a result of the innovation? Show the new price level on the graph you drew for part (b).

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- d. Suggest one or more factors that could prevent this market from adjusting to equilibrium.

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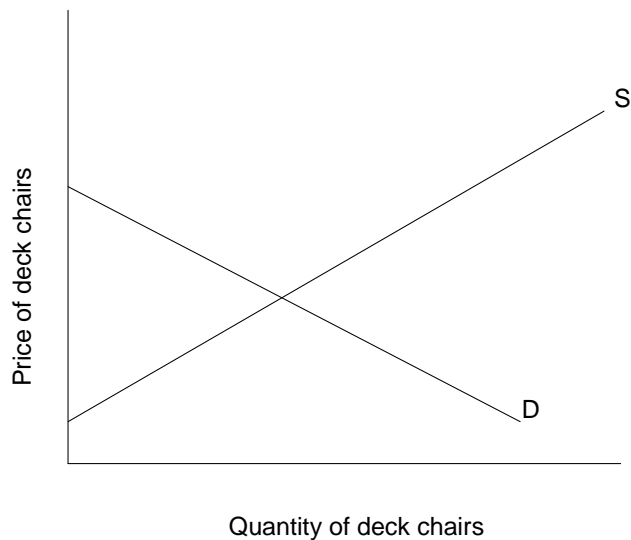
3. Refer again to the graph above, showing the market for hardcover dictionaries. What are the two types of change in this market that would lead the equilibrium price to *rise*?

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4. In a popular new movie, a central character spends much of his time sitting on a white deck chair. Suddenly, white deck chairs come into fashion and everybody wants one. The graph below shows the market for deck chairs *before* the movie came out.



- On the diagram above, show what happens to the market for deck chairs as a result of the movie.
- Show the size of the shortage that exists in the short term, before the market adjusts to equilibrium.
- Label the new equilibrium point as  $E_2$ .

5. Using the same example of the market in white deck chairs, describe and, on separate graphs, show the changes in equilibrium price and quantity that would occur in response to the following events.

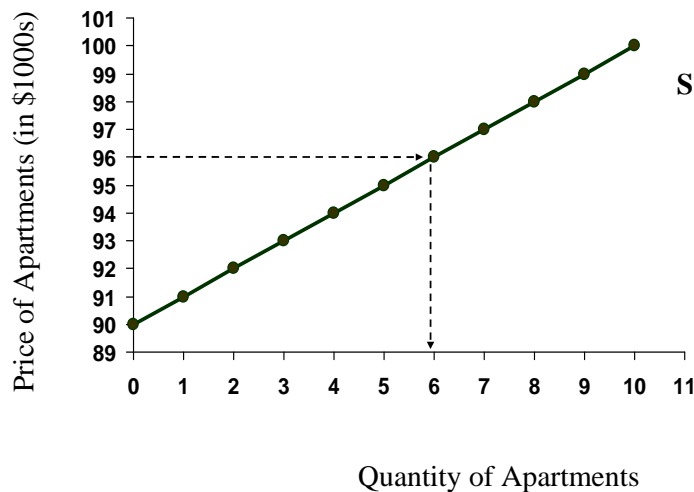
- A key input for making deck chairs becomes more expensive (*ceteris paribus*).
- In a highly publicized event, someone falls off a poorly constructed deck chair and sustains a serious head injury (*ceteris paribus*).

## Self Test

1. Which of the following is an example of *empirical* work?
  - a. Susanna develops a simple model to represent the life cycle of a certain species of grasshopper.
  - b. Juliana collects data on frog populations in a local pond.
  - c. Marshal experiments with a supply and demand model, shifting the supply curve to the left and right.
  - d. Anaya predicts likely changes in the housing market, using a housing model.
  - e. Jorge builds a model city using a sophisticated computer program.
2. The three main modes of investigation for understanding variations in price and quantities are:
  - a. Time series, theoretical, and empirical
  - b. Time series, empirical, and supply curve analysis
  - c. Empirical, theoretical, and historical
  - d. Empirical, theoretical, and thought experiments
  - e. Time series, thought experiments, and supply curve analysis

Questions 3 to 5 refer to the following graph:

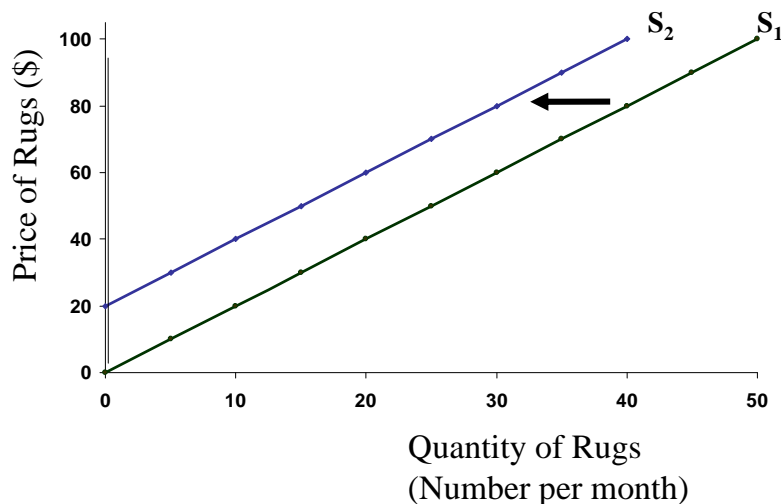
The Supply Curve for Apartments



3. Based on Figure 4.1, how many apartment owners would be willing to sell their apartments for \$91,000?
  - a. None
  - b. One
  - c. Two
  - d. Six
  - e. All ten apartment owners

4. In the scenario depicted in Figure 4.1, up to ten apartments may be available for sale. Suppose that ten more apartment owners enter the market, for a total of twenty available apartments. These new entrants into the market would be willing to sell their apartments for any price above \$90,000. Which of the following statements accurately describes the resulting change in the supply curve?
- The supply curve shifts upward.
  - The supply curve shifts to the right.
  - The supply curve shifts to the left.
  - The supply curve becomes longer.
  - The supply curve can no longer be represented by a straight line.
5. In the situation described in question #4, how many apartment owners would be willing to sell their apartments for \$91,000?
- None
  - One
  - Two
  - Ten
  - Eleven
6. Which of the following statements is true, regarding the supply of a particular good, and that good's own price?
- A price increase shifts the supply curve to the right.
  - A price decrease shifts the supply curve to the right.
  - A price increase shifts the supply curve downward.
  - A price changes alone does not shift the supply curve.
  - A price change is the only way to shift the supply curve.

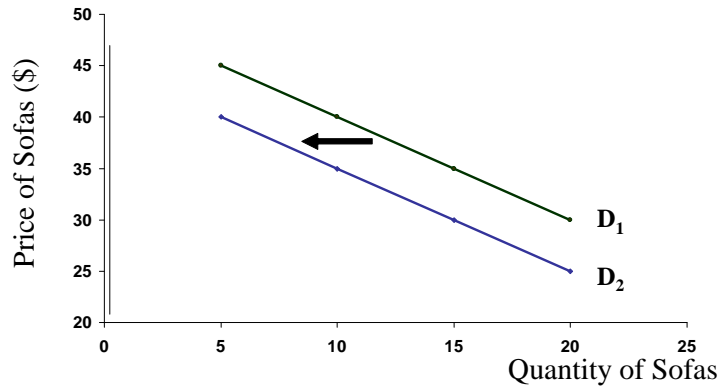
Question #7 refers to the following graph.



7. The graph shown above depicts two possible supply curves for production of handmade rugs.  $S_1$  is the initial supply curve, and  $S_2$  is the new supply curve after a change has occurred in the market. Which of the following events could have caused this shift?
- Several rug makers have left the market, making handmade rugs more scarce.
  - Several new rug makers have entered the market, making handmade rugs more plentiful.
  - The price of thread used in rugs has dropped, making it cheaper to produce rugs.
  - Rugs have come into fashion, so buyers want more of them.
  - Rugs have gone out of fashion, so buyers want fewer of them.
8. Which of the following is *not* an example of a “nonprice determinant of supply” of handmade rugs?
- Available technology for making rugs.
  - The price of looms for weaving rugs.
  - Number of rug producers.
  - Price of related goods and services.
  - Price of handmade rugs.
9. Which of the following is an example of movement *along* a supply curve?
- The quantity of apples offered for sale increases as the price of apples rises.
  - An apple orchard burns down in an accidental fire, decreasing the number of suppliers on the market.
  - Thanks to good weather conditions, apple growers enjoy a bumper crop this year.
  - The price of pears doubles, increasing demand for apples.
  - The price of fertilizer increases, making it more expensive to produce apples.
10. Which of the following statements is true?
- Markets respond to both effective and latent demand.
  - Markets respond to demand, even if that demand is not backed up by cash.
  - Markets respond only to wants or needs that are backed up by the ability to pay.
  - Demand curves represent "effective demand" only.
  - Both c and d are true.
11. Samantha runs a small business selling birthday cakes. She gets an order for 10 cakes due next week. She decides to hire an assistant to help her bake the 10 cakes. Samantha's need for an assistant is an example of
- derived supply
  - derived demand
  - the law of demand
  - a nonprice determinant of demand

- e. a nonprice determinant of supply

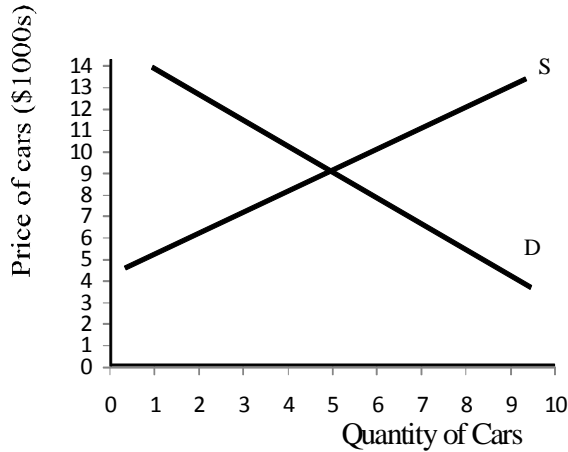
Question #12 refers to the following graph:



12. Assume that sofas and arm chairs are substitute goods. The graph shown above illustrates the demand curve for sofas. Which of the following events could have triggered the shift in demand from  $D_1$  to  $D_2$ , as shown above?

- The price of sofas increased.
  - The price of armchairs increased.
  - The price of labor for making sofas increased.
  - The price of sofas decreased.
  - The price of armchairs decreased.
13. A bike shop in a small town has received a shipment of 10 new bicycles. The shop offers the bikes for sale at a price of \$300 each. At this price, however, there are only two people in town who are willing to buy a bicycle. This situation can be described as
- disequilibrium
  - shortage
  - surplus
  - equilibrium
  - both a and c are correct

Questions 14 to 16 refer to the following graph.



14. When the price of cars is \$5000, which of the following terms is *not* an accurate description of the situation?
- Quantity demanded exceeds quantity supplied.
  - A shortage exists.
  - The market is in disequilibrium.
  - Fewer than five cars are available for sale.
  - The market is in equilibrium.
15. Beginning from the price of \$5000, which of the following events would be predicted by the theory of market adjustment?
- Some buyers who are willing to pay more will bid the price of cars up.
  - The market will remain in disequilibrium.
  - Prices will fall.
  - All buyers will remain in the market.
  - The supply and demand curves will shift to achieve equilibrium.
16. Now suppose that the local government invests in a new, very efficient fleet of buses. Now, it is easy and affordable to get from one place to another without having your own car. What change in the graph shown above is most likely to result from the new bus service?
- The supply curve shifts to the right.
  - The supply curve shifts to the left.
  - The demand curve shifts to the right.
  - The demand curve shifts to the left.
  - None of the above.
17. At the end of a hot day, ten people want to buy a glass of lemonade. However, the local lemonade stand only has five glasses of lemonade left. The lemonade stand operator sells the remaining five glasses to the five people who are willing and able to pay the most. This is an example of

- a. surplus
- b. rationing by price
- c. the signaling function of markets
- d. a shift in the demand curve
- e. a lottery

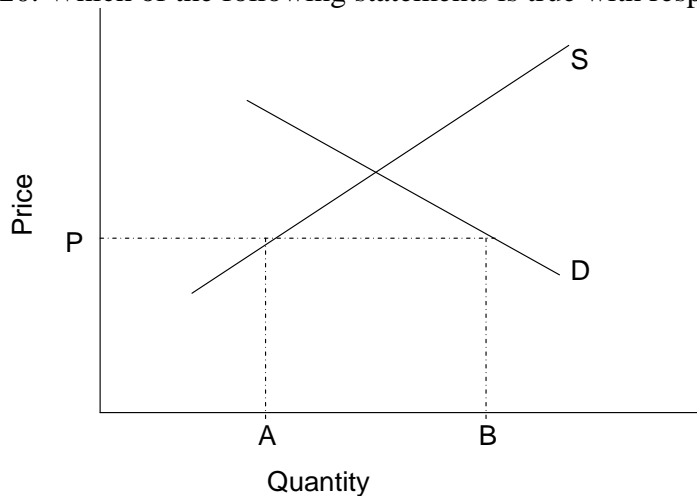
18. Which of the following is an example of a price ceiling?

- a. A group of producers form a cartel.
- b. A young woman realizes she cannot get a promotion at her job unless she gets another degree.
- c. A group of sellers agree among themselves that they will not sell their product below a certain price.
- d. Nobody is allowed to charge more than \$5 per bag of corn.
- e. None of the above.

19. A cartel is

- a. An organization that sells oil.
- b. A consortium of consumers.
- c. An institution that creates price ceilings.
- d. A group of producers who mutually agree to limit their production, in order to sustain a price floor.
- e. A group of producers who mutually agree to trade with one another.

20. Which of the following statements is true with respect to the graph shown below?



- a. Price P is a price floor that affects the quantity traded on the market.
- b. At price P, quantity demanded exceeds quantity supplied.
- c. At price P, quantity A is demanded.
- d. At price P, this market is in equilibrium.

e. Both a and b are true.

### Answers to Active Review Questions

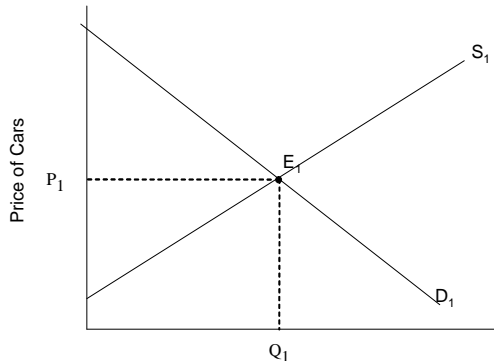
1. empirical
2. time series
3. demand
4. effective
5. substitute
6. complementary
7. disequilibrium
8. static
9. decrease, increase
10. rationing
11. a. shortage b. inadequacy c. scarcity
12. False. To derive a supply curve empirically we would have to hold everything else in the market constant while varying just the price, and measure the quantity of the good in question supplied at each price. Approximations of this exercise have been done, but in general, a supply curve represents a thought experiment rather than a depiction of empirical data.
13. True. For example, if limes command a high price, lemon producers might switch to lime production, thus decreasing the total supply of lemons available.
14. True.
15. True.
16. False. In general, an increase in demand tends to increase both equilibrium price and equilibrium quantity.
17. Market supply: 200.
18. Available technology of production; resource prices; number of producers; producer expectations about future prices and technology; prices of related goods and services.
19. The demand curve slopes downward because in general, the higher the price of the good, the fewer people will want to buy it.
20. Occasionally, people will want more of a good if it is sold as a "prestige" good at a high price. This phenomenon might sometimes be observed with specialty foods, clothes, or cars.
21. "Change in quantity demanded" refers to movement *along* the demand curve. For example, if the price of apples rises, all other things being equal, people will buy fewer apples; thus, the quantity demanded will decrease. A "change in demand" refers to a situation in which the entire demand curve shifts. For example, if a large number of new people move into your neighborhood, there will be a larger pool of people interested in buying apples at the local grocery store.
22. A static model assumes that all adjustments occur instantaneously. A dynamic model explicitly takes the passage of time into account.
23. The textbook describes the example of the shortage of nursing staff in health care settings, a shortage that has existed for decades. You may come up with other real-life or hypothetical examples. For example, adjustment to equilibrium might take a long time in a housing market; sellers might keep prices high for a period of time,

hoping to find takers, even though few people are willing to purchase homes at those prices.

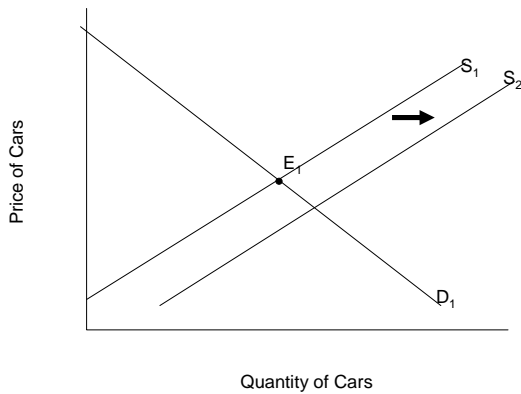
- 24. The signaling function of the market refers to the market's ability to carry information throughout the economy, for example about what goods people want and how readily those goods can be produced. The rationing function of the market refers to its function in determining who gets what quantity of any given resource.
- 25. No, this market is not in equilibrium; there is a shortage of movie tickets.

**Answers to Problems**

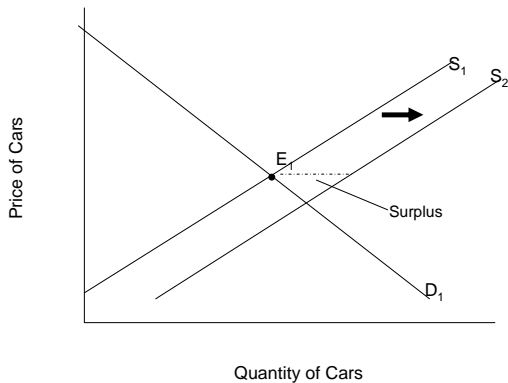
1. a.



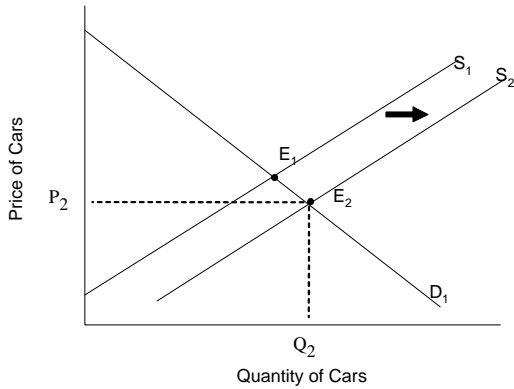
1. b.



1. c. The shift in the supply curve creates a temporary surplus.

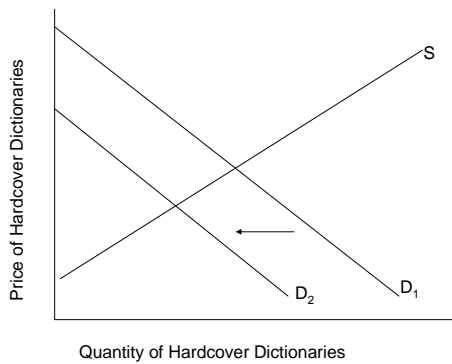


1. d.



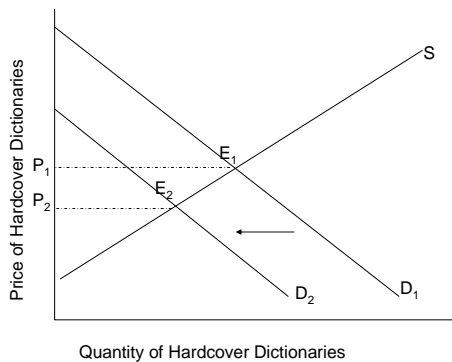
1. e. The supply curve has shifted to the right. The equilibrium price has fallen, and equilibrium quantity has risen.

2. a. The demand curve shifts to the left.



2. b. The supply curve does not shift.

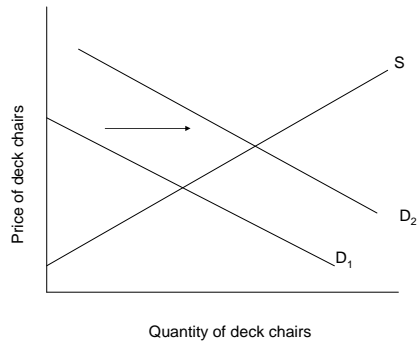
2. c. The price of hardcover dictionaries at the new equilibrium,  $E_2$ , is lower.



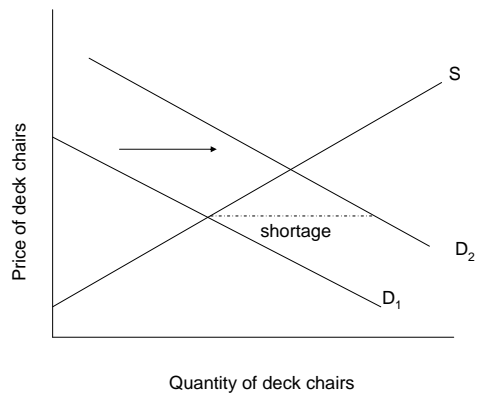
d. Many answers are possible here. For example, dictionary producers might continue charging high prices out of habit, failing to recognize – or not wanting to admit -- that demand has changed significantly.

3. The equilibrium price could rise as a result of the supply curve shifting to the left (i.e. a decrease in supply), or as a result of the demand curve shifting to the right (i.e. an increase in demand).

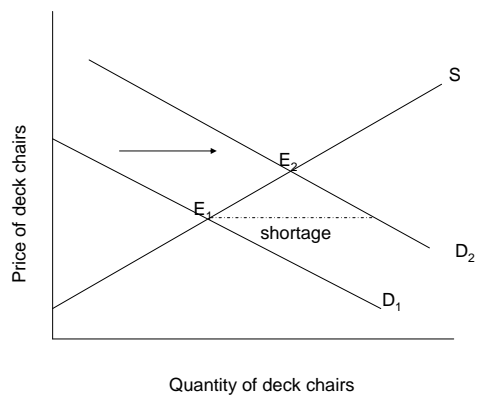
4. a.. The demand curve shifts to the right, as shown below.



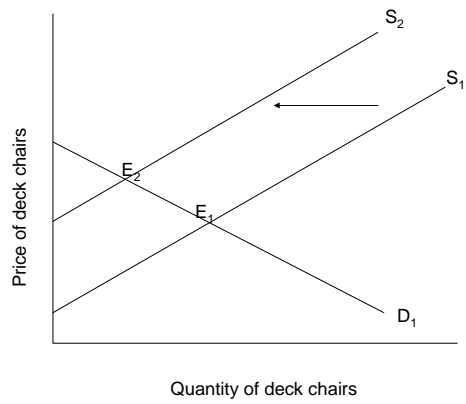
4. b.



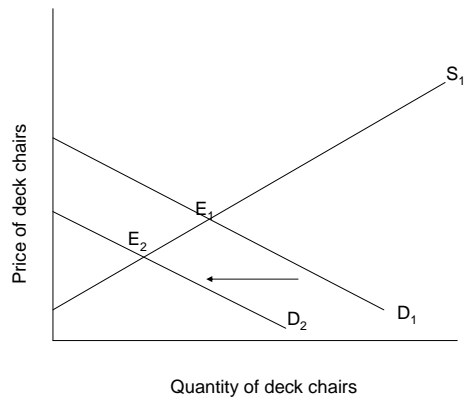
4. c.



5. a. The supply curve shifts to the left, leading to a higher equilibrium price and lower equilibrium quantity.



5. b. The demand curve shifts to the left, leading to a lower equilibrium price and lower equilibrium quantity.



### Answers to Self Test Questions

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|-------|-------|
| 1. b  | 11. b |
| 2. c  | 12. e |
| 3. b  | 13. e |
| 4. b  | 14. e |
| 5. e  | 15. a |
| 6. d  | 16. d |
| 7. a  | 17. b |
| 8. e  | 18. d |
| 9. a  | 19. d |
| 10. e | 20. b |