

7. The demand and supply schedules for gum are in the table.

Price (cents per pack)	Quantity demanded (millions of packs a week)	Quantity supplied
20	180	60
40	140	100
60	100	140
80	60	180

- a. Suppose that the price of gum is 70¢ a pack. Describe the situation in the gum market and explain how the price adjusts.

At 70 cents a pack, there is a surplus of gum and the price falls. At 70 cents a pack, the quantity demanded is 80 million packs a week and the quantity supplied is 160 million packs a week. There is a surplus of 80 million packs a week. The price falls until market equilibrium is restored at a price of 50 cents a pack.

- b. Suppose that the price of gum is 30¢ a pack. Describe the situation in the gum market and explain how the price adjusts.

At 30 cents a pack, there is a shortage of gum and the price rises. At 30 cents a pack, the quantity demanded is 160 million packs a week and the quantity supplied is 80 million packs a week. There is a shortage of 80 million packs a week. The price rises until market equilibrium is restored at a price of 50 cents a pack.

8. The following events occur one at a time:

- (i) The price of crude oil rises.
- (ii) The price of a car rises.
- (iii) All speed limits on highways are abolished.
- (iv) Robots cut car production costs.

Explain the effect of each of these events on the market for gasoline.

(ii) and (iii) and (iv) change the demand for gasoline. The demand for gasoline will change if the price of a car rises, all speed limits on highways are abolished, or robot production cuts the cost of producing a car. If the price of a car rises, the quantity of cars bought decrease and the demand for gasoline decreases. If all speed limits on highways are abolished, people will drive faster and use more gasoline. The demand for gasoline increases. If robot production plants lower the cost of producing a car, the supply of cars will increase. With no change in the demand for cars, the price of a car will fall and more cars will be bought. The demand for gasoline increases.

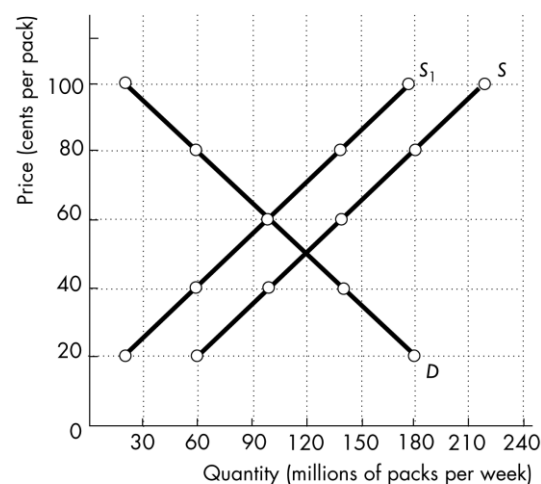
(i) changes the supply of gasoline. The supply of gasoline will change if the price of crude oil (a factor of production used in the production of gasoline) changes. If the price of crude oil rises, the cost of producing gasoline rises and the supply of gasoline decreases.

9. In Problem 7, a fire destroys some factories that produce gum and the quantity of gum supplied decreases by 40 million packs a week at each price.

- a. Explain what happens in the market for gum and draw a graph to illustrate the changes.

As the number of gum-producing factories decreases, the supply of gum decreases. There is a new supply schedule and, in Figure 3.1, the supply curve shifts leftward by 40 million packs at each price to the new supply curve S_1 . After the fire, the quantity supplied at 50 cents is now

FIGURE 3.1
Problem 9

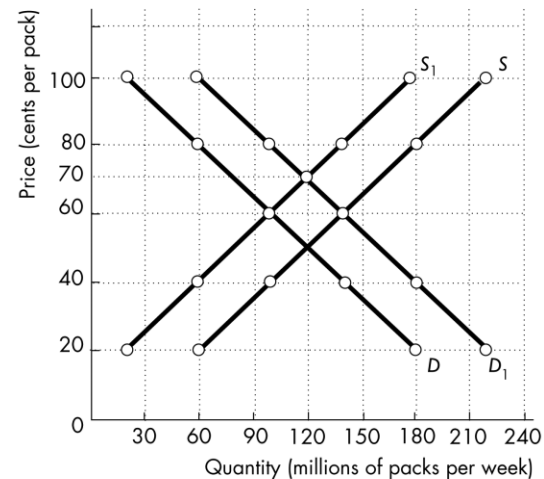


only 80 million packs, and there is a shortage of gum. The price rises to 60 cents a pack, at which the new quantity supplied equals the quantity demanded. The new equilibrium price is 60 cents and the new equilibrium quantity is 100 million packs a week.

- b. If, at the time as the fire the teenage population increases and the quantity of gum demanded increases 40 million packs a week at each price. What is the new market equilibrium? Show the changes on your graph.

The new price is 70 cents a pack, and the quantity is 120 million packs a week. The demand for gum increases and the demand curve shifts rightward by 40 million packs at each price. Supply decreases by 40 millions packs a week and the supply curve shifts leftward by 40 million packs at each price. These changes are shown in Figure 3.2 by the shift of the demand curve from D to D_1 and the shift of the supply curve from S to S_1 . At any price below 70 cents a pack there is a shortage of gum. The price of gum rises until the shortage is eliminated.

FIGURE 3.2
Problem 9b



14. Think about the demand for the three game consoles: Xbox One, PlayStation 4, and Wii U. Explain the effect of the following events on the demand for Xbox One games and the quantity of Xbox One games demanded, other things remaining the same. The events are:
- The price of an Xbox One falls.
An Xbox One and an Xbox One game are complements. When the price of an Xbox One falls, consumers respond by increasing the quantity of Xbox Ones demanded so the equilibrium quantity of Xbox Ones increases. Consumers increase their demand for Xbox one games because an Xbox One console is useless without Xbox One games.
 - The prices of a PlayStation 4 and a Wii U fall.
A PlayStation 4 and a Wii U are substitutes for an Xbox One. When these game consoles fall in price, the demand for Xbox One consoles decreases and so the equilibrium quantity of Xbox Ones decreases. Consumers decrease their demand for Xbox One games because an Xbox One game is useless without an Xbox One console.
 - The number of people writing and producing Xbox One games increases.
The increase in the number of people writing Xbox One games increases the supply of Xbox One games. The demand for Xbox One games does not change but the increase in the supply lowers the price of an Xbox One game. The fall in the price of Xbox One games increases the quantity of Xbox Ones demanded.
 - Consumers' incomes increase.
Xbox One games are surely a normal good. So an increase in consumers' incomes increases the demand for Xbox One games.
 - Programmers who write code for Xbox One games become more costly to hire.
The increase in the cost of programmers decreases the supply of Xbox One games. When the supply of a good or service decreases, the price of that good or service rises. Xbox One games are not an exception, so the price of an Xbox One game rises. The rise in the price of an Xbox One game decreases the quantity of Xbox One games demanded.

- f. The expected future price of an Xbox One game falls.
When the price of an Xbox One game is expected to fall, the (current) demand for Xbox One games decreases.
- g. A new game console that is a close substitute for Xbox One comes onto the market.
The new game console decreases the demand for Xbox One consoles. As a result, the equilibrium quantity of Xbox One consoles decreases. Consumers decrease their demand for Xbox One games because an Xbox One game is useless without an Xbox One console.

20. The demand and supply schedules for potato chips are in the table.

Price (cents per bag)	Quantity demanded (millions of bags a week)	Quantity supplied (millions of bags a week)
50	160	130
60	150	140
70	140	150
80	130	160
90	120	170
100	110	180

- a. Draw a graph of the potato chip market and mark in the equilibrium price and quantity.

Figure 3.5 draws the supply and demand curves for this market. The equilibrium price is 65¢ a bag, and the equilibrium quantity is 145 million bags a week.

- b. If the price is 60¢ a bag, is there a shortage or a surplus, and how does the price adjust?

At 60¢ a bag, there is a shortage of potato chips and the price rises. At 60¢ a bag, the quantity demanded is 150 million bags a week and the quantity supplied is 140 million bags a week. The difference is a shortage of 10 million bags a week. The price rises until market equilibrium is restored—65¢ a bag and 145 million bags a week.

21. In Problem 20, a new dip increases the quantity of potato chips that people want to buy by 30 million bags per week at each price.

- a. Does the demand for chips change? Does the supply of chips change? Describe the change.

As the new dip comes onto the market, the demand for potato chips increases. Supply does not change. The demand curve shifts rightward.

- b. How do the equilibrium price and equilibrium quantity of chips change?

Demand increases by 30 million bags a week. The demand curve shifts rightward as shown in Figure 3.6 by the shift from D to D_1 . The quantity demanded at each price increases by 30 million bags. The quantity demanded at 65¢ is now 175 million bags a week of potato chips. The price rises to 80¢ a bag, at which the quantity supplied equals the quantity demanded (160 million bags a week). The new equilibrium price is 80¢ per bag and the new equilibrium quantity is 160 million bags.

FIGURE 3.5
Problem 20a

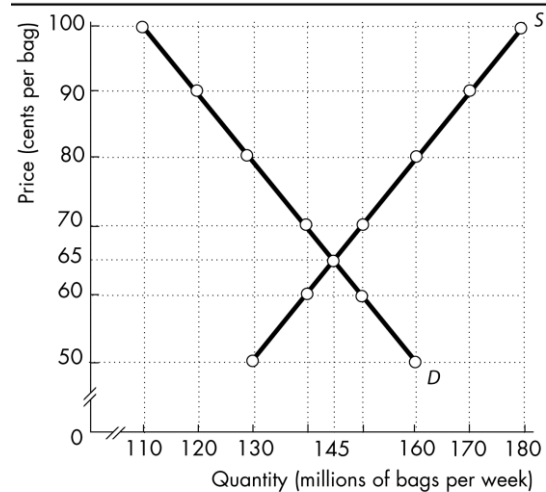
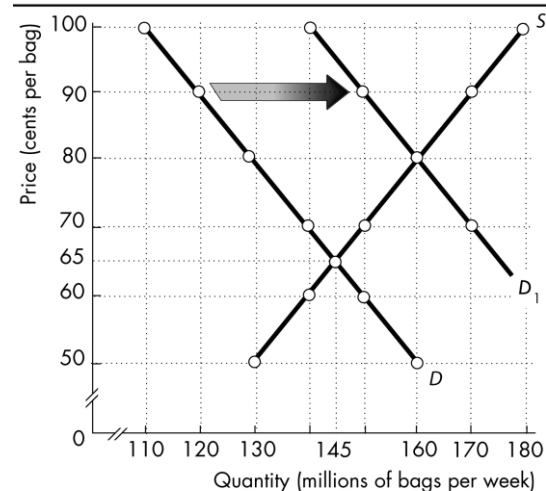


FIGURE 3.6
Problem 21b



22. In Problem 20, if a virus destroys potato crops and the quantity of potato chips produced decreases by 40 million bags a week at each price, how does the supply of chips change?
The supply of potato chips decreases, and the supply curve shifts leftward by 40 million bags. The price rises to 85¢ a bag and the quantity decreases to 125 million bags a week.
23. If the virus in Problem 22 hits just as the new dip in Problem 21 comes onto the market, how do the equilibrium price and equilibrium quantity of chips change?
The result by itself of the new dip entering the market is a price of 80¢ a bag and a quantity of 160 million bags. But now with the virus affecting the market, at this price there is a shortage of potato chips. The price of potato chips rises until the shortage is eliminated. The new equilibrium price is 100¢ a bag, and the new equilibrium quantity is 140 million bags a week.
26. **Watch Out for Rising Dry-Cleaning Bills**
In the past year, the price of dry-cleaning solvent doubled. More than 4,000 dry cleaners across the United States disappeared as budget-conscious consumers cut back. This year the price of hangers used by dry cleaners is expected to double.
- Source: CNN Money, June 4, 2012
- Explain the effect of rising solvent prices on the market for dry cleaning.
Solvents are used to produce dry cleaning, so a rise in the price of solvents increases the cost of dry cleaning. The increase in the cost of dry cleaning decreases the supply of dry cleaning and the supply curve of dry cleaning shifts leftward. The demand for dry cleaning does not change. By itself, the decrease in the supply raises the equilibrium price of dry cleaning and decreases the equilibrium quantity of dry cleaning.
 - Explain the effect of consumers becoming more budget conscious along with the rising price of solvent on the price of dry cleaning.
Consumers becoming more budget conscious means that the demand for dry cleaning decreases and the demand curve for dry cleaning shifts leftward. Combined with the decrease in supply from rising solvent prices, the equilibrium quantity of dry cleaning decreases. The effect on the equilibrium price of dry cleaning, however, is ambiguous. If the decrease in supply exceeds the decrease in demand, the price rises; if the decrease in supply is less than the decrease in demand, the price falls; and, if the decrease in supply equals the decrease in demand, the price does not change.
 - If the price of hangers does rise this year, do you expect additional dry cleaners to disappear? Explain why or why not.
The increase in the price of hangers raises the costs of dry cleaners but the cost increase is much smaller than the cost increase that resulted from the doubling of the price of dry-cleaning solvent. Therefore the decrease in supply is smaller, which means that the decrease in the equilibrium quantity of dry cleaning also is smaller. If the small decrease in the equilibrium quantity leads some additional dry cleaners to close, the number will be small.

Economics in the News

27. After you have studied *Economics in the news* on pp. 112–113, answer the following questions:
- What would happen to the price of bananas if TR4 spread to Central America?
The price of bananas would rise.
 - What are some of the substitutes for bananas and what would happen to demand, supply, price, and quantity in the markets for these items if TR4 were to come to America?
Banana consumers could substitute other fruits, such as apples, peaches, or apricots. These changes would not change the supply of these products. The demand for these products, however, would increase, thereby raising their price and quantity.

- c. What are some of the complements of bananas and what would happen to demand, supply, price, and quantity in the markets for these items if TR4 were to come to America?

The classic complement for bananas is cereal. A rise in the price of bananas decreases the demand for cereal, so the demand curve for cereal shifts leftward. The supply of cereal is unaffected. The decrease in the demand for cereal lowers the equilibrium price of cereal and decreases the equilibrium quantity of cereal.

- d. When the price of bananas increased in 2008, did it rise by as much as the rise in the price of oil? Why or why not?

In 2008 the price of oil rose by about 70 percent, so the 20 percent price hike in the price of bananas was much less than the rise in price of oil. The price of oil is a cost of producing bananas. When the price of oil rose, the cost of producing bananas rose, so that the supply of bananas decreased. In response, the price of bananas rose. But there are other costs of producing bananas. The other costs did not rise by as much as the price of oil, so the decrease in the supply of bananas was smaller and, accordingly, the rise in the price of bananas was less than of oil.

- e. Why would the expectation of the future arrival of TR4 in the Americas have little or no effect on today's price of bananas?

If TR4 arrives in the Americas, the supply of bananas will decrease, thereby raising the price. The rise in the future expected for some goods can decrease the current supply and increase the current demand. But these changes assume that the good is storable. For example, the current supply decreases when the expected future price rises because producers store the product to sell in the future when its price is expected to be higher. Bananas, however, are not storable. Therefore producers (and demanders) do not respond to the higher expected future price.