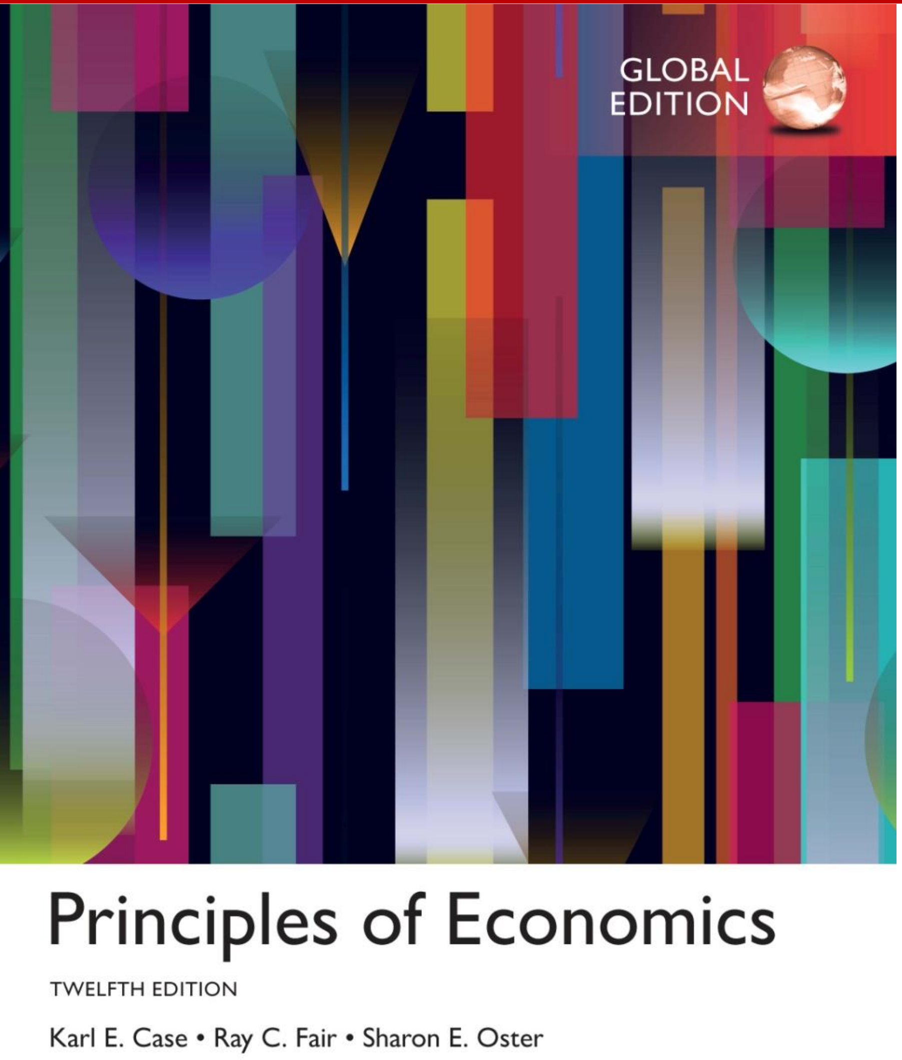
Principles of Economics
Twelfth Edition



Chapter 3
Demand, Supply, and Market Equilibrium

Chapter 3 Demand, Supply, and Market Equilibrium

- Chapter 2 discusses how individuals solve economic problems directly.
- This chapter explains the basic forces at work in market systems.
- This chapter explains how individual decisions answer the three basic economic questions.

Firms and Households: The Basic Decision-Making Units

- **firm** An organization that transforms resources (inputs) into products (outputs). Firms are the primary producing units in a market economy.
- **entrepreneur** A person who organizes, manages, and assumes the risks of a firm, taking a new idea or a new product and turning it into a successful business.
- **households** The consuming units in an economy.

Input Markets and Output Markets: The Circular Flow *(1 of 4)*

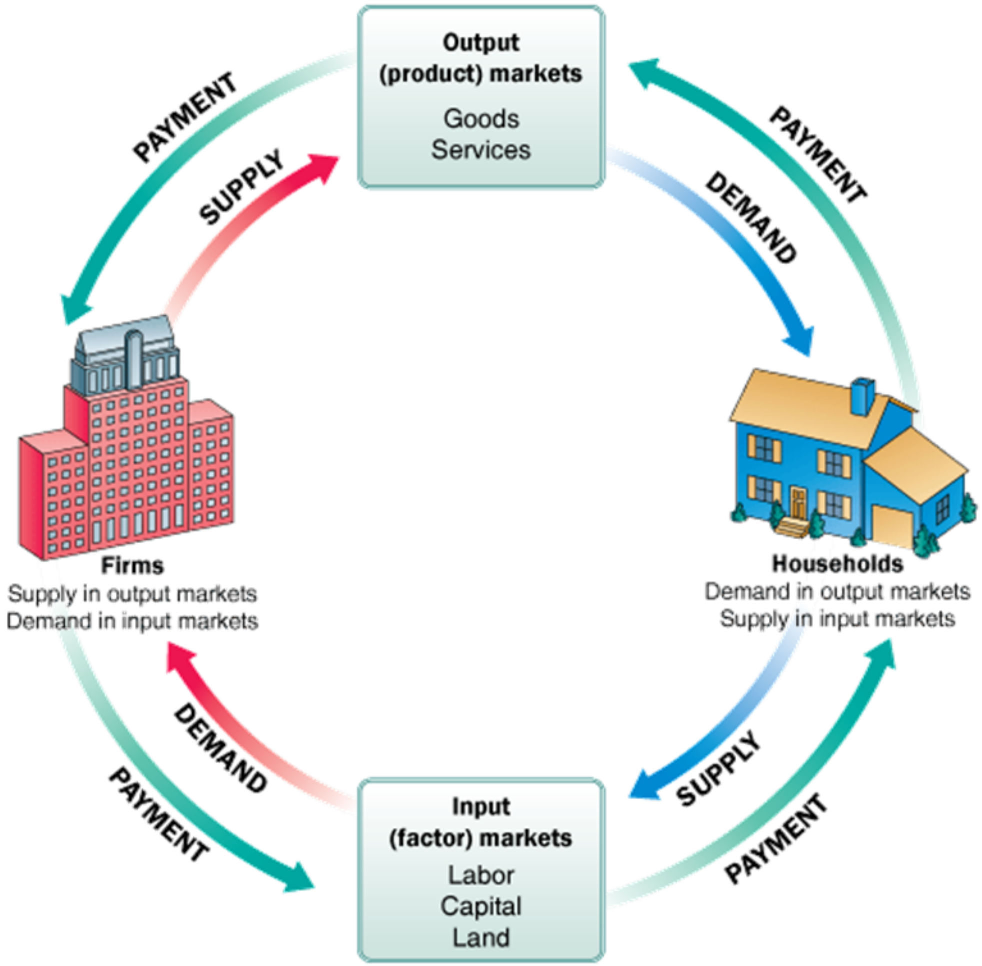
- **product** or **output markets** The markets in which goods and services are exchanged.
- **input** or **factor markets** The markets in which the resources used to produce goods and services are exchanged.

FIGURE 3.1 The Circular Flow of Economic Activity

Diagrams like this one show the circular flow of economic activity, hence the name *circular flow diagram*. Here goods and services flow clockwise: Labor services supplied by households flow to firms, and goods and services produced by firms flow to households.

Payment (usually money) flows in the opposite (counterclockwise) direction: Payment for goods and services flows from households to firms, and payment for labor services flows from firms to households.

Note: Color Guide—In this figure households are depicted in *blue*, and firms are depicted in *red*. From now on, all diagrams relating to the behavior of households will be blue or shades of blue, and all diagrams relating to the behavior of firms will be red or shades of red. The green color indicates a monetary flow.



Input Markets and Output Markets: The Circular Flow *(2 of 4)*

- **labor market** The input/factor market in which households supply work for wages to firms that demand labor.
- **capital market** The input/factor market in which households supply their savings, for interest or for claims to future profits, to firms that demand funds to buy capital goods.

Input Markets and Output Markets: The Circular Flow *(3 of 4)*

- **land market** The input/factor market in which households supply land or other real property in exchange for rent.
- **factors of production** The inputs into the production process. Land, labor, and capital are the three key factors of production.

Input Markets and Output Markets: The Circular Flow *(4 of 4)*

- Input and output markets are connected through the behavior of both firms and households.
- Firms determine the quantities and character of outputs produced and the types and quantities of inputs demanded.
- Households determine the types and quantities of products demanded and the quantities and types of inputs supplied.

Demand in Product/Output Markets *(1 of 2)*

- A household's decision about what quantity of a particular output, or product, to demand depends on a number of factors, including:
  - The *price of the product* in question
  - The *income available* to the household
  - The household's *amount of accumulated wealth*
  - The prices of *other products* available to the household
  - The household's *tastes and preferences*
  - The household's *expectations* about future income, wealth, and prices

Demand in Product/Output Markets *(2 of 2)*

- **quantity demanded** The amount (number of units) of a product that a household would buy in a given period if it could buy all it wanted at the current market price.
- It is important to focus on the price change alone with the *ceteris paribus*, or “all else equal,” assumption.

Changes in Quantity Demanded versus Changes in Demand

- Changes in the price of a product affect the *quantity demanded* per period.
- Changes in any other factor, such as income or preferences, affect *demand*.
- Thus, we say that an increase in the price of Coca-Cola is likely to cause a decrease in the *quantity of Coca-Cola demanded*. However, we say that an increase in income is likely to cause an increase in the *demand* for most goods.

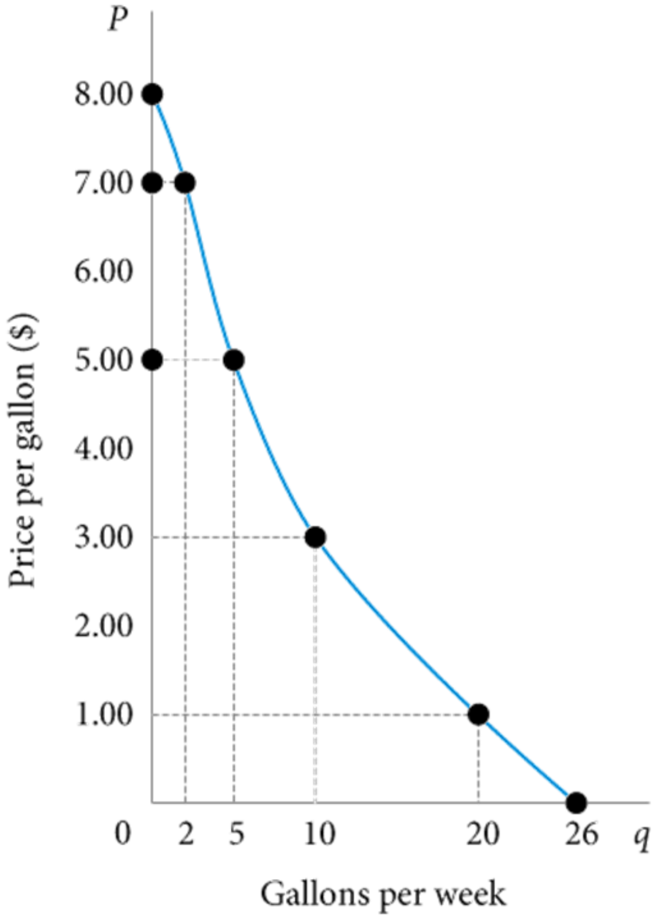
Price and Quantity Demanded: The Law of Demand *(1 of 3)*

- **demand schedule** Shows how much of a given product a household would be willing to buy at different prices for a given time period.
- **demand curve** A graph illustrating how much of a given product a household would be willing to buy at different prices.

TABLE 3.1 Alex's Demand Schedule for Gasoline

Price (per gallon)	Quantity Demanded (gallons per week)
$8.00	0
7.00	2
6.00	3
5.00	5
4.00	7
3.00	10
2.00	14
1.00	20
0.00	26

FIGURE 3.2 Alex's Demand Curve



The relationship between price (P) and quantity demanded (q) presented graphically is called a demand curve.
Demand curves have a negative slope, indicating that lower prices cause quantity demanded to increase.
Note that Alex's demand curve is blue; demand in product markets is determined by household choice.

Price and Quantity Demanded: The Law of Demand *(2 of 3)*

Demand Curves Slope Downward

- **law of demand** The negative relationship between price and quantity demanded: *Ceteris paribus*, as price rises, quantity demanded decreases; as price falls, quantity demanded increases during a given period of time, all other things remaining constant.
- It is reasonable to expect quantity demanded to fall when price rises, *ceteris paribus*, and to expect quantity demanded to rise when price falls, *ceteris paribus*.
- A demand curve has a negative slope.

Price and Quantity Demanded: The Law of Demand *(3 of 3)*

Other Properties of Demand Curves

- To summarize what we know about the shape of demand curves:
  1. They have a negative slope.
  2. They intersect the quantity (*X*) axis, a result of time limitations and diminishing marginal utility.
  3. They intersect the price (*Y*) axis, a result of limited income and wealth.
- The actual shape of an individual household demand curve depends on the unique tastes and preferences of the household and other factors.

Other Determinants of Household Demand *(1 of 3)*

Income and Wealth

- **income** The sum of all a household's wages, salaries, profits, interest payments, rents, and other forms of earnings in a given period of time. It is a flow measure.
- **wealth** or **net worth** The total value of what a household owns minus what it owes. It is a stock measure.

Other Determinants of Household Demand *(2 of 3)*

Income and Wealth

- **normal goods** Goods for which demand goes up when income is higher and for which demand goes down when income is lower.
- **inferior goods** Goods for which demand tends to fall when income rises.

Other Determinants of Household Demand *(3 of 3)*

Prices of Other Goods and Services

- **substitutes** Goods that can serve as replacements for one another; when the price of one increases, demand for the other increases.
- **perfect substitutes** Identical products.
- **complements, complementary goods** Goods that “go together”; a decrease in the price of one results in an increase in demand for the other and vice versa.

Other Determinants of Household Demand *(1 of 2)*

Tastes and Preferences

- Changes in preferences can and do manifest themselves in market behavior.
- Within the constraints of prices and incomes, preference shapes the demand curve, but it is difficult to generalize about tastes and preferences.

Other Determinants of Household Demand *(2 of 2)*

Expectations

- What you decide to buy today certainly depends on today's prices and your current income and wealth.
- Increasingly, economic theory has come to recognize the importance of expectations.
- It is important to understand that demand depends on more than just current incomes, prices, and tastes.

Shifts of Demand versus Movement along a Demand Curve *(1 of 2)*

- **shift of a demand curve** The change that takes place in a demand curve corresponding to a new relationship between quantity demanded of a good and price of that good. The shift is brought about by a change in the original conditions.
- **movement along a demand curve** The change in quantity demanded brought about by a change in price.

TABLE 3.2 Shift of Alex's Demand Schedule Resulting from an Increase in Income

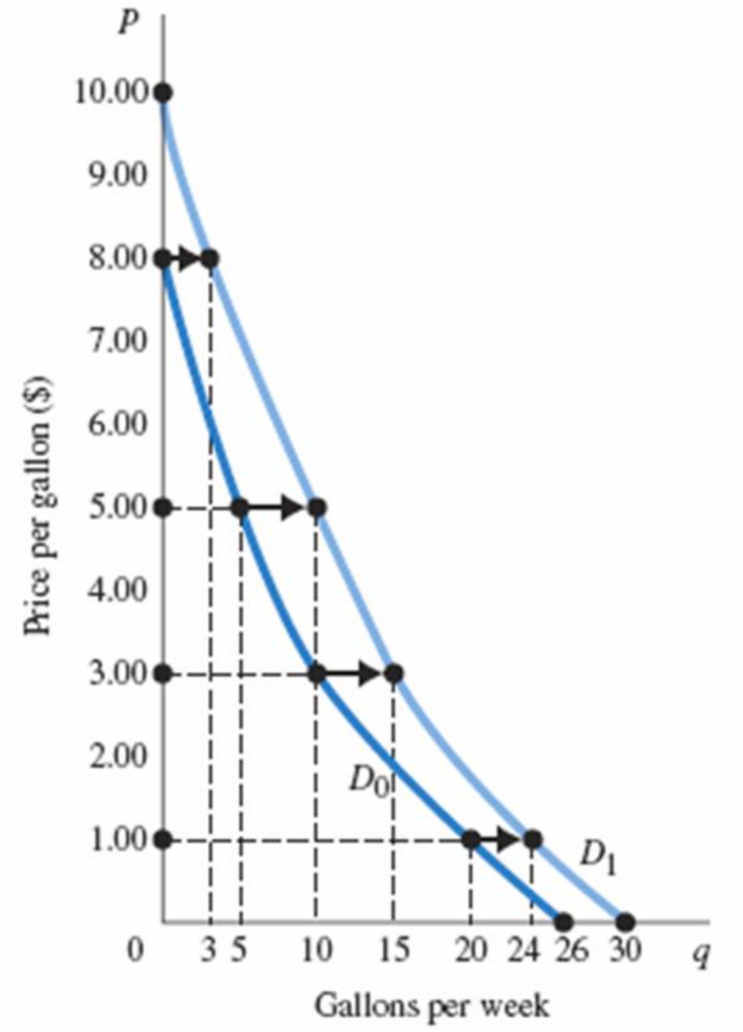
Price (per Gallon)	Schedule D_0 Quantity Demanded (Gallons per Week at an Income of $500 per Week)	Schedule D_1 Quantity Demanded (Gallons per Week at an Income of $700 per Week)
$8.00	0	3
7.00	2	5
6.00	3	7
5.00	5	10
4.00	7	12
3.00	10	15
2.00	14	19
1.00	20	24
0.00	26	30

FIGURE 3.3 Shift of a Demand Curve Following a Rise in Income

When the price of a good changes, we move *along* the demand curve for that good.

When any other factor that influences demand changes (income, tastes, and so on), the demand curve shifts, in this case from D_0 to D_1.

Gasoline is a normal good, so an income increase shifts the curve to the right.



Shifts of Demand versus Movement along a Demand Curve *(2 of 2)*

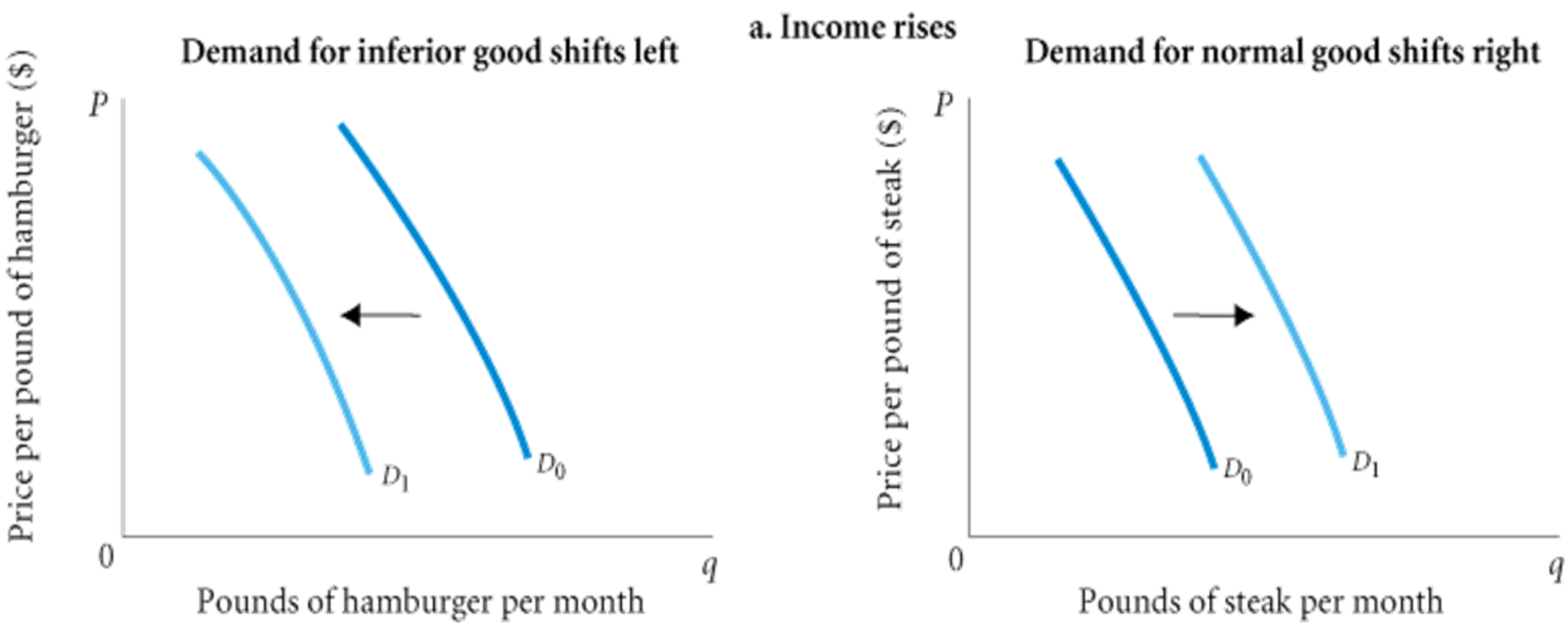
- Change in price of a good or service leads to

  → change in *quantity demanded* (**movement along a demand curve**).

- Change in income, preferences, or prices of other goods or services leads to

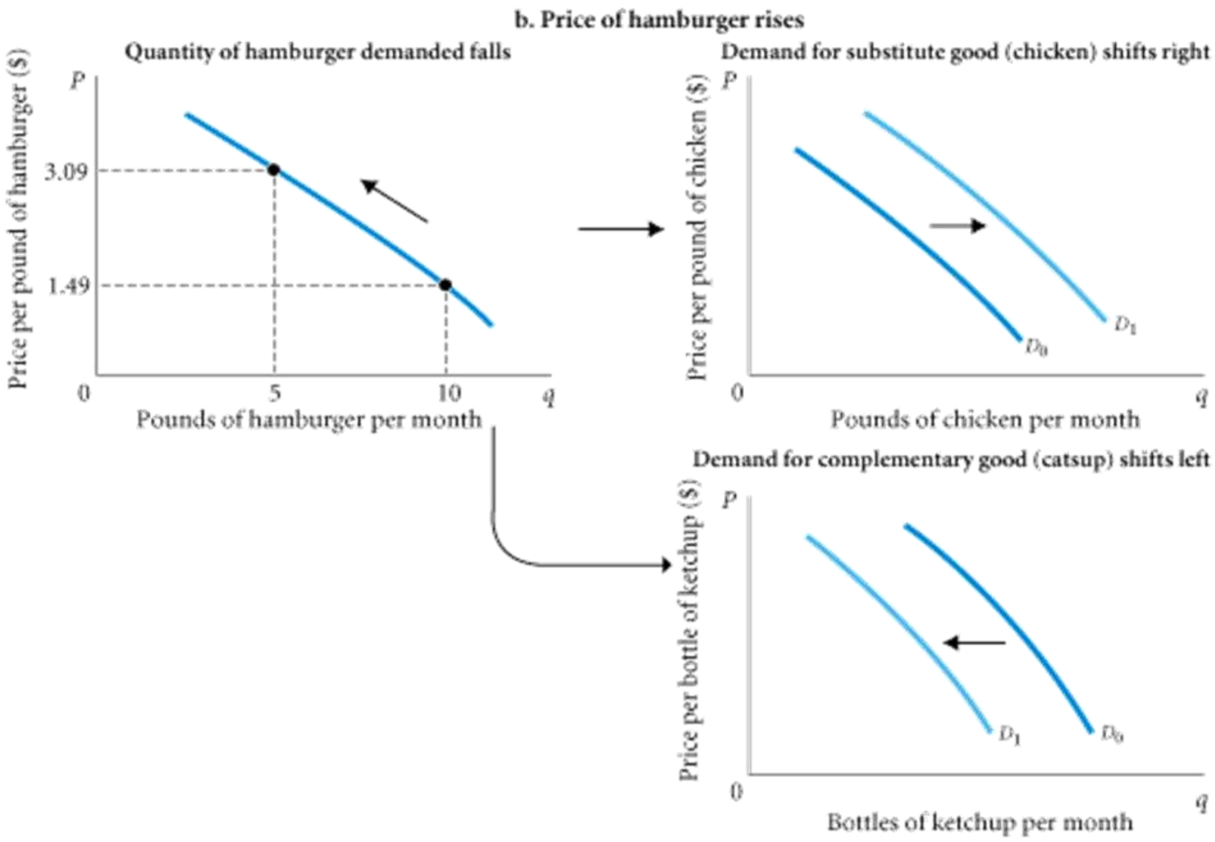
  → change in *demand* (**shift of a demand curve**).

FIGURE 3.4 Shifts versus Movement along a Demand Curve *(1 of 2)*



a. When income increases, the demand for inferior goods *shifts to the left*, and the demand for normal goods *shifts to the right*.

FIGURE 3.4 Shifts versus Movement along a Demand Curve (*cont’d 2 of 2*)

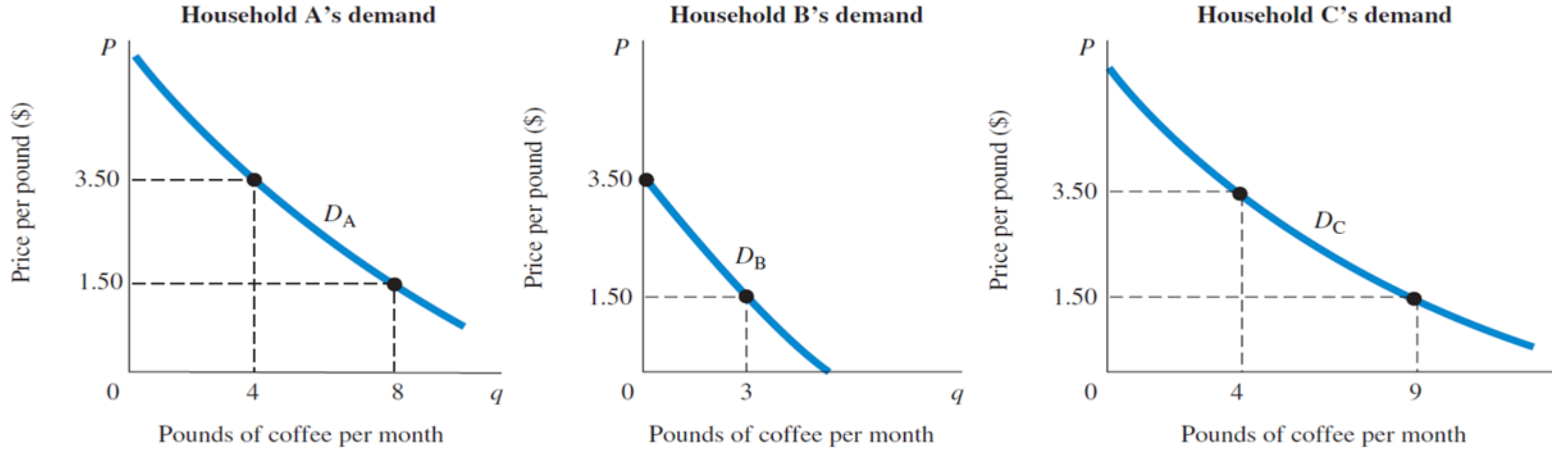


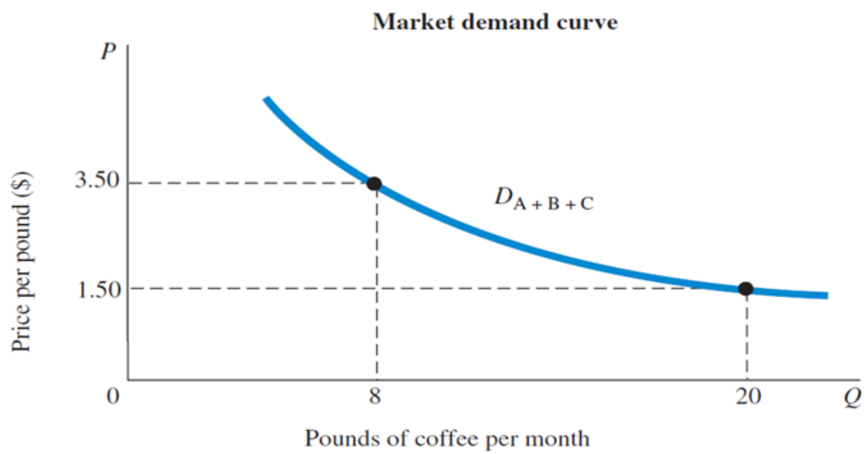
b. If the price of hamburger rises, the quantity of hamburger demanded declines; this is a movement along the demand curve.
The same price rise for hamburger would shift the demand for chicken (a substitute for hamburger) to the right and the demand for ketchup (a complement to hamburger) to the left.

From Household Demand to Market Demand

- **market demand** The sum of all the quantities of a good or service demanded per period by all the households buying in the market for that good or service.

FIGURE 3.5 Deriving Market Demand from Individual Demand Curves





Price	Quantity (*q*) Demanded by A		B		C	Total Quantity Demanded in the Market (*Q*)
$3.50	4	+	0	+	4	= 8
1.50	8	+	3	+	9	= 20

Total demand in the marketplace is simply the sum of the demands of all the households shopping in a particular market. It is the sum of all the individual demand curves—that is, the sum of all the individual quantities demanded at each price.

Supply in Product/Output Markets

- Firms build factories, hire workers, and buy raw materials because they believe they can sell the products they make for more than it costs to produce them.
- **profit** The difference between revenues and costs.

Price and Quantity Supplied: The Law of Supply *(1 of 2)*

- **quantity supplied** The amount of a particular product that a firm would be willing and able to offer for sale at a particular price during a given time period.
- **supply schedule** Shows how much of a product firms will sell at alternative prices.

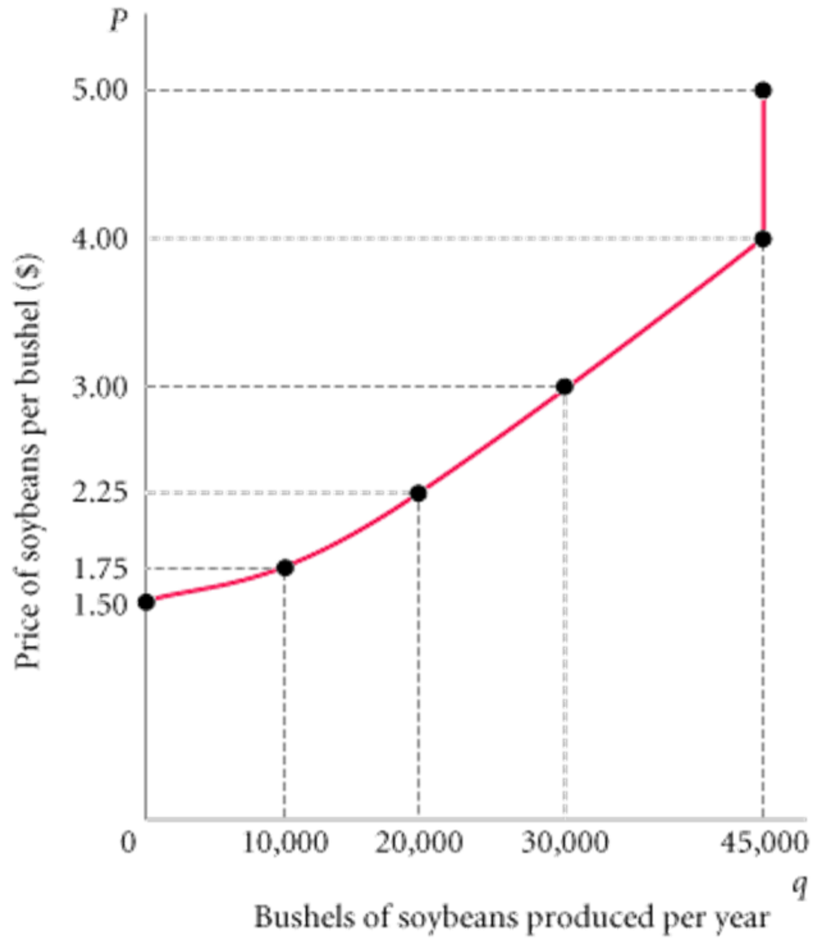
Price and Quantity Supplied: The Law of Supply *(2 of 2)*

- **law of supply** The positive relationship between price and quantity of a good supplied: An increase in market price, *ceteris paribus*, will lead to an increase in quantity supplied, and a decrease in market price will lead to a decrease in quantity supplied.
- **supply curve** A graph illustrating how much of a product a firm will sell at different prices.

TABLE 3.3 Clarence Brown's Supply Schedule for Soybeans

Price (per Bushel)	Quantity Supplied (Bushels per Year)
$1.50	0
1.75	10,000
2.25	20,000
3.00	30,000
4.00	45,000
5.00	45,000

FIGURE 3.6 Clarence Brown's Individual Supply Curve



A producer will supply more when the price of output is higher. The slope of a supply curve is positive.

Note that the supply curve is red: Supply is determined by choices made by firms.

Other Determinants of Supply *(1 of 2)*

The Cost of Production

- For a firm to make a profit, its revenue must exceed its costs.
- Cost of production depends on a number of factors, including the available technologies and the prices and quantities of the inputs needed by the firm (labor, land, capital, energy, and so on).

Other Determinants of Supply *(2 of 2)*

The Prices of Related Products

- Assuming that its objective is to maximize profits, a firm's decision to supply depends on:
  1. The price of the good or service
  2. The cost of producing the product, which in turn depends on:
     - The price of required inputs (labor, capital, and land)
     - The technologies that can be used to produce the product
  3. The prices of related products

Shift of Supply versus Movement along a Supply Curve *(1 of 2)*

- **movement along a supply curve** The change in quantity supplied brought about by a change in price.
- **shift of a supply curve** The change that takes place in a supply curve corresponding to a new relationship between quantity supplied of a good and the price of that good. The shift is brought about by a change in the original conditions.

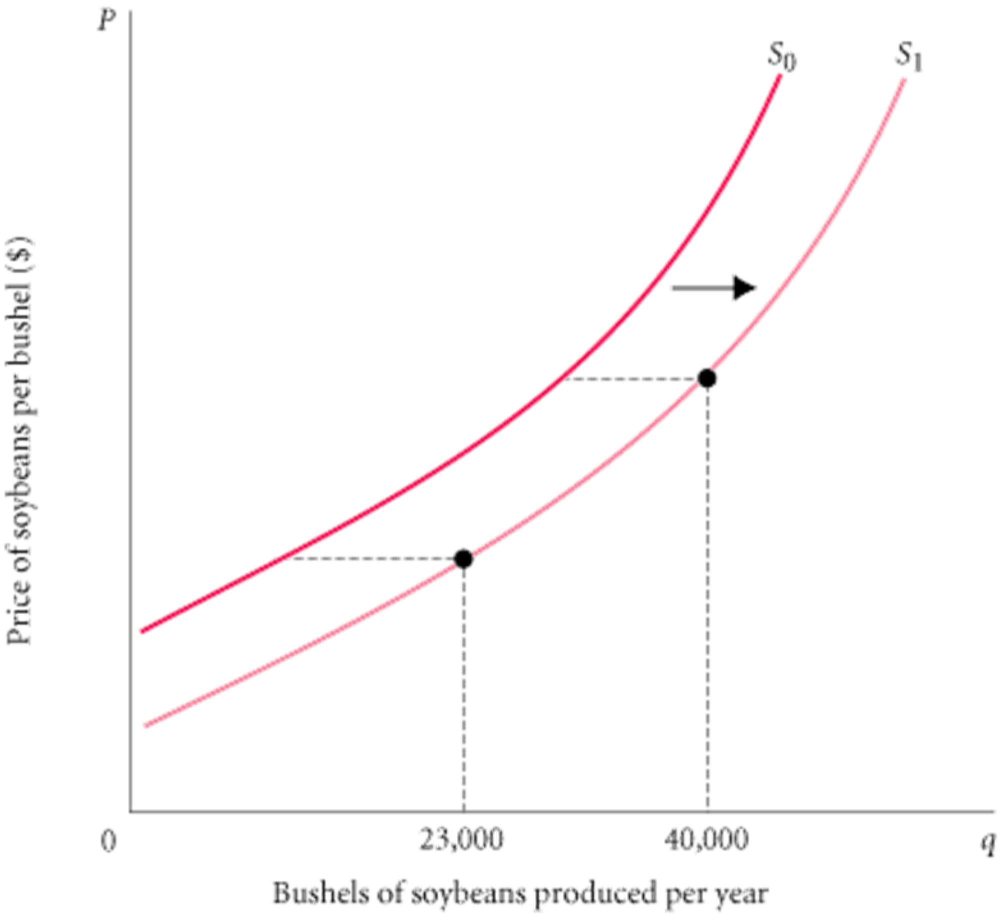
TABLE 3.4 **Shift of Supply Schedule for Soybeans following Development of a New Disease-Resistant Seed Strain**

Price (per Bushel)	Schedule S_0 Quantity Supplied (Bushels per Year Using Old Seed)	Schedule S_1 Quantity Supplied (Bushels per Year Using New Seed)
$1.50	0	5,000
1.75	10,000	23,000
2.25	20,000	33,000
3.00	30,000	40,000
4.00	45,000	54,000
5.00	45,000	54,000

FIGURE 3.7 Shift of the Supply Curve for Soybeans Following Development of a New Seed Strain

When the price of a product changes, we move *along* the supply curve for that product; the quantity supplied rises or falls.

When any other factor affecting supply changes, the supply curve *shifts*.



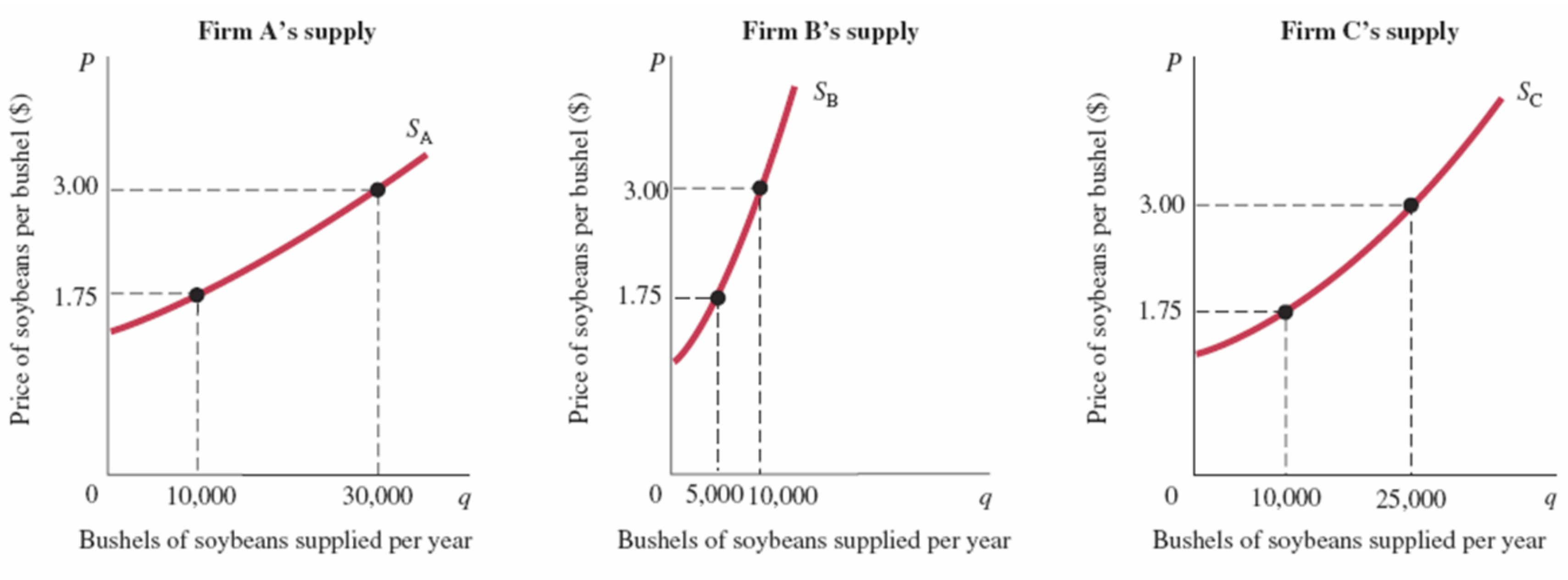
Shift of Supply versus Movement along a Supply Curve *(2 of 2)*

- It is very important to distinguish between movements along supply curves (changes in quantity supplied) and shifts in supply curves (changes in supply):
- Change in price of a good or service leads to
  → change in *quantity supplied* (**movement along a supply curve**).
- Change in costs, input prices, technology, or prices of related goods and services leads to
  → change in *supply* (**shift of a supply curve**).

From Individual Supply to Market Supply

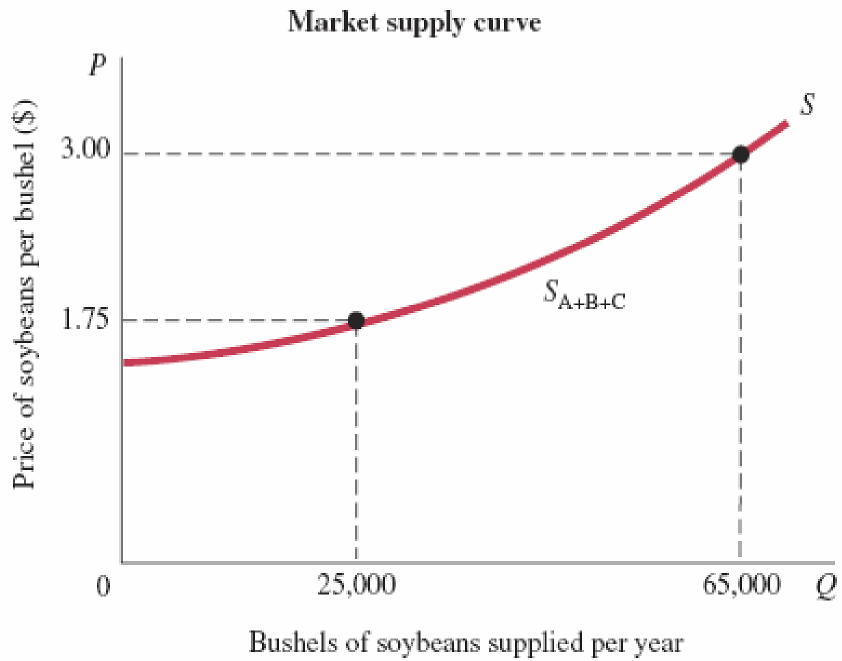
- **market supply** The sum of all that is supplied each period by all producers of a single product.

FIGURE 3.8 Deriving Market Supply from Individual Firm Supply Curves



Total supply in the marketplace is the sum of all the amounts supplied by all the firms selling in the market. It is the sum of all the individual quantities supplied at each price.

FIGURE 3.8 Deriving Market Supply from Individual Firm Supply Curves (cont'd)



Price	Quantity (q) Supplied by A		B		C		Total Quantity Supplied in the Market (Q)
$3.00	30,000	+	10,000	+	25,000	=	65,000
1.75	10,000	+	5,000	+	10,000	=	25,000

Total supply in the marketplace is the sum of all the amounts supplied by all the firms selling in the market. It is the sum of all the individual quantities supplied at each price.

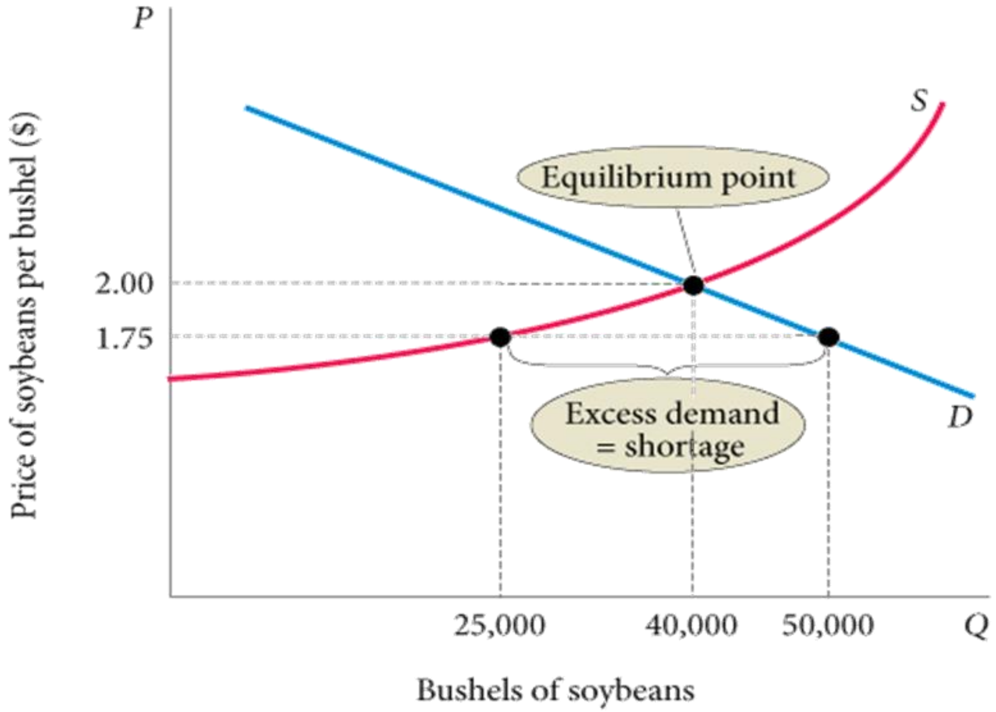
Market Equilibrium

- **equilibrium** The condition that exists when quantity supplied and quantity demanded are equal. At equilibrium, there is no tendency for price to change.

Excess Demand

- **excess demand or shortage** The condition that exists when quantity demanded exceeds quantity supplied at the current price.

FIGURE 3.9 Excess Demand, or Shortage



At a price of $1.75 per bushel, quantity demanded exceeds quantity supplied.

When *excess demand* exists, there is a tendency for price to rise.

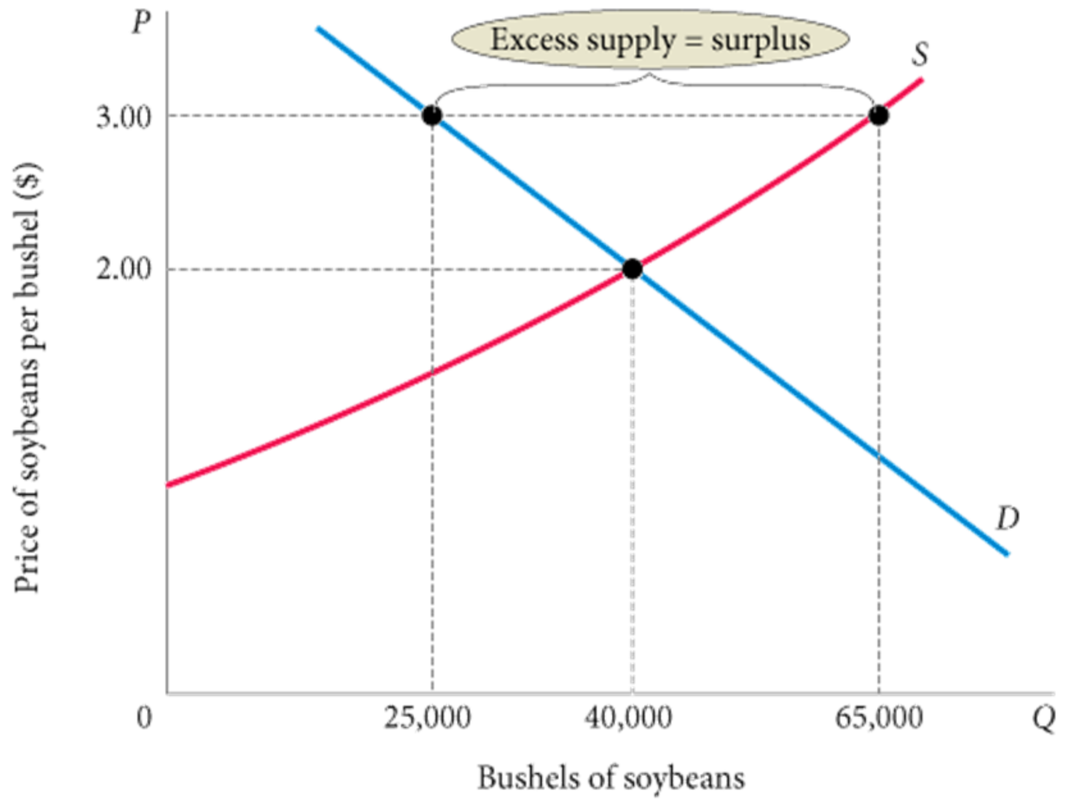
When quantity demanded equals quantity supplied, excess demand is eliminated and the market is in equilibrium.

Here the equilibrium price is $2.00, and the equilibrium quantity is 40,000 bushels.
Here the equilibrium price is $2.00, and the equilibrium quantity is 40,000 bushels.

Excess Supply

- **excess supply** or **surplus** The condition that exists when quantity supplied exceeds quantity demanded at the current price.
- When quantity supplied exceeds quantity demanded at the current price, the price tends to fall.
- When price falls, quantity supplied is likely to decrease, and quantity demanded is likely to increase until an equilibrium price is reached where quantity supplied and quantity demanded are equal.

FIGURE 3.10 Excess Supply, or Surplus



At a price of $3.00, quantity supplied exceeds quantity demanded by 40,000 bushels. This excess supply will cause the price to fall.

Changes in Equilibrium

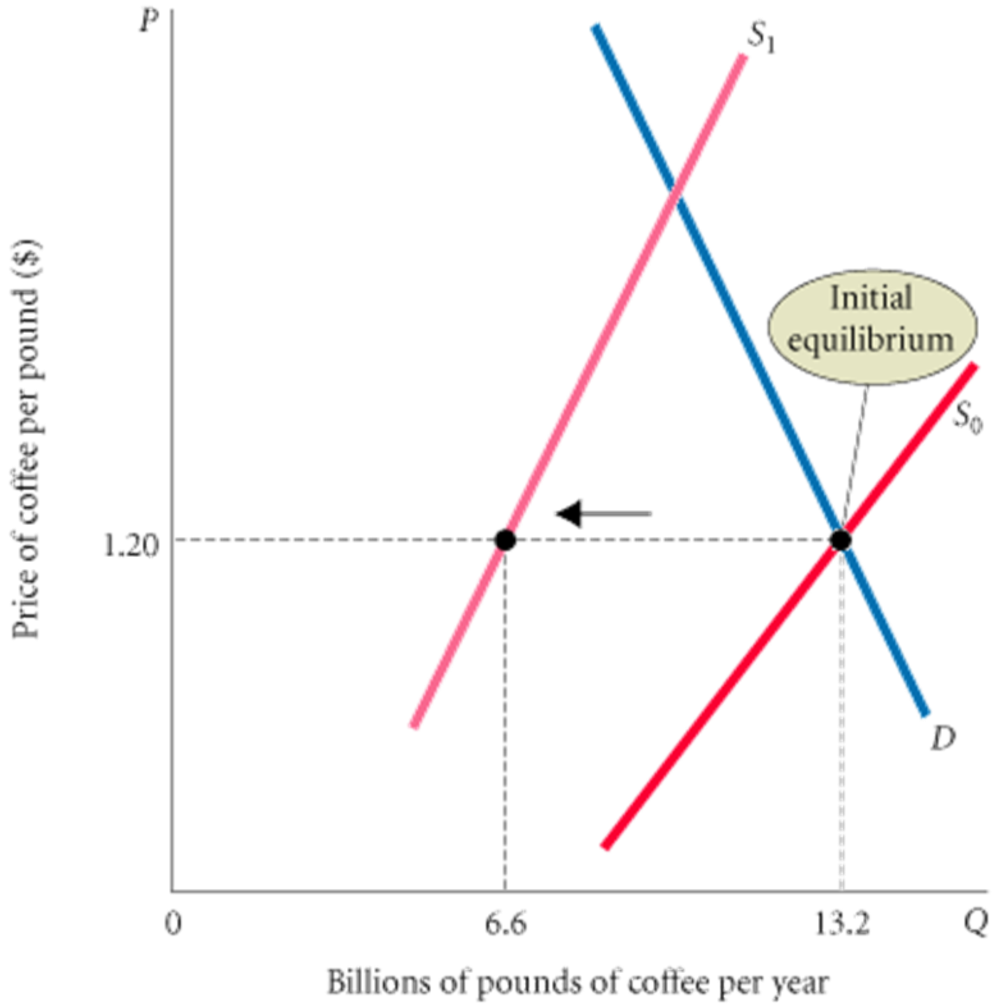
- When supply and demand curves shift, the equilibrium price and quantity change.

FIGURE 3.11 The Coffee Market: A Shift of Supply and Subsequent Price Adjustment

Before the freeze, the coffee market was in equilibrium at a price of $1.20 per pound.

At that price, quantity demanded equaled quantity supplied.

The freeze shifted the supply curve to the left (from S_0 to S_1), increasing the equilibrium price to $2.40.



ECONOMICS IN PRACTICE
Quinoa

Quinoa, a high-protein grain, was once eaten mostly by people in Peru and Bolivia.

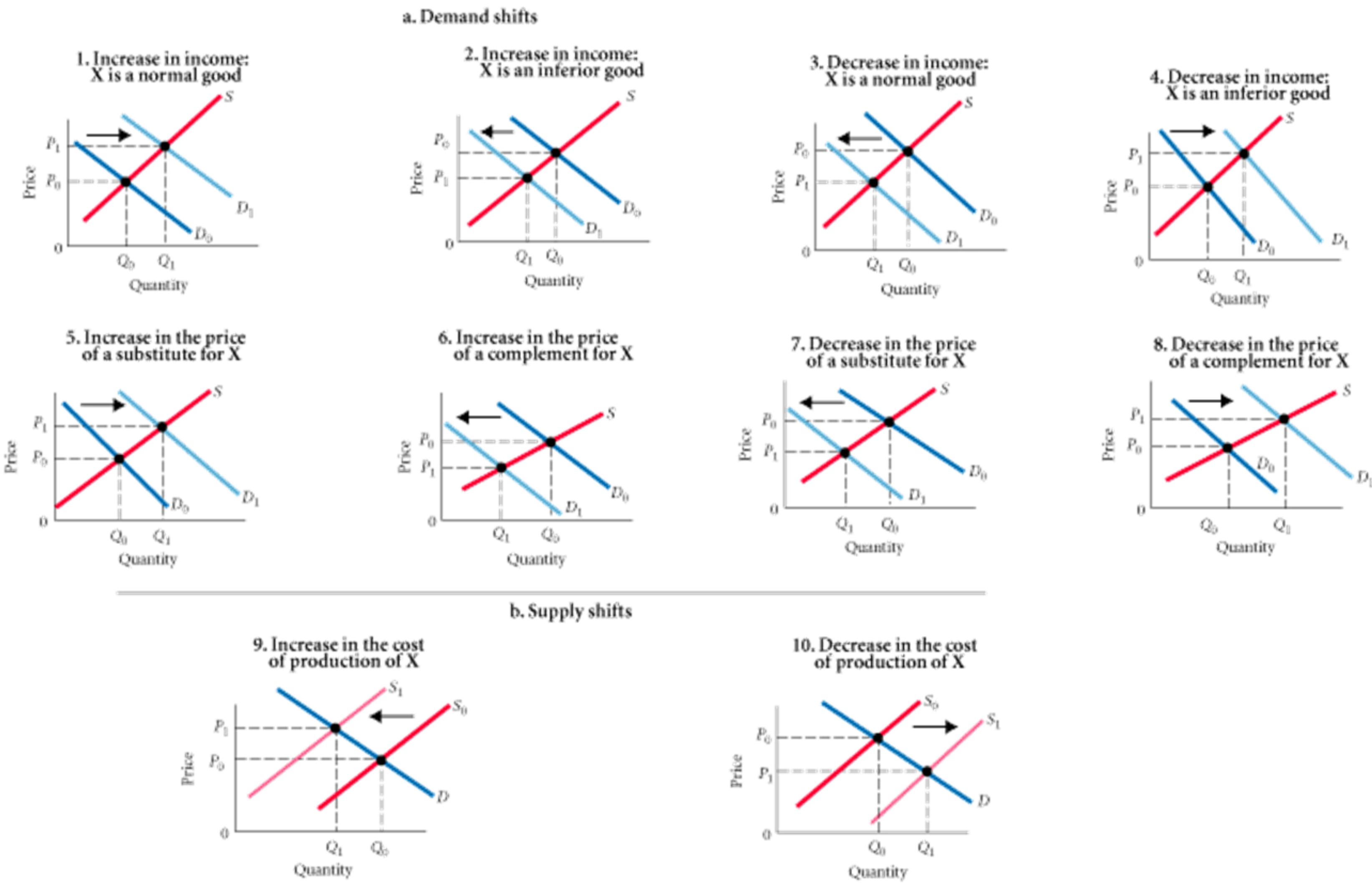
Growth in vegetarianism shifted the demand curve for quinoa to the right, resulting in higher prices.

Despite new farmer entry in response to higher quinoa prices, the particular nature of the production process limited the amount of the shift.

THINKING PRACTICALLY

1. Use a graph to show the movement in prices and quantities described in the quinoa market.

FIGURE 3.12 Examples of Supply and Demand Shifts for Product *X*



Demand and Supply in Product Markets: A Review *(1 of 2)*

- Important points to remember about the mechanics of supply and demand in product markets:

  1. A demand curve shows how much of a product a household would buy if it could buy all it wanted at the given price. A supply curve shows how much of a product a firm would supply if it could sell all it wanted at the given price.

  2. Quantity demanded and quantity supplied are always per time period—that is, per day, per month, or per year.

  3. The demand for a good is determined by price, household income and wealth, prices of other goods and services, tastes and preferences, and expectations.

Demand and Supply in Product Markets: A Review *(2 of 2)*

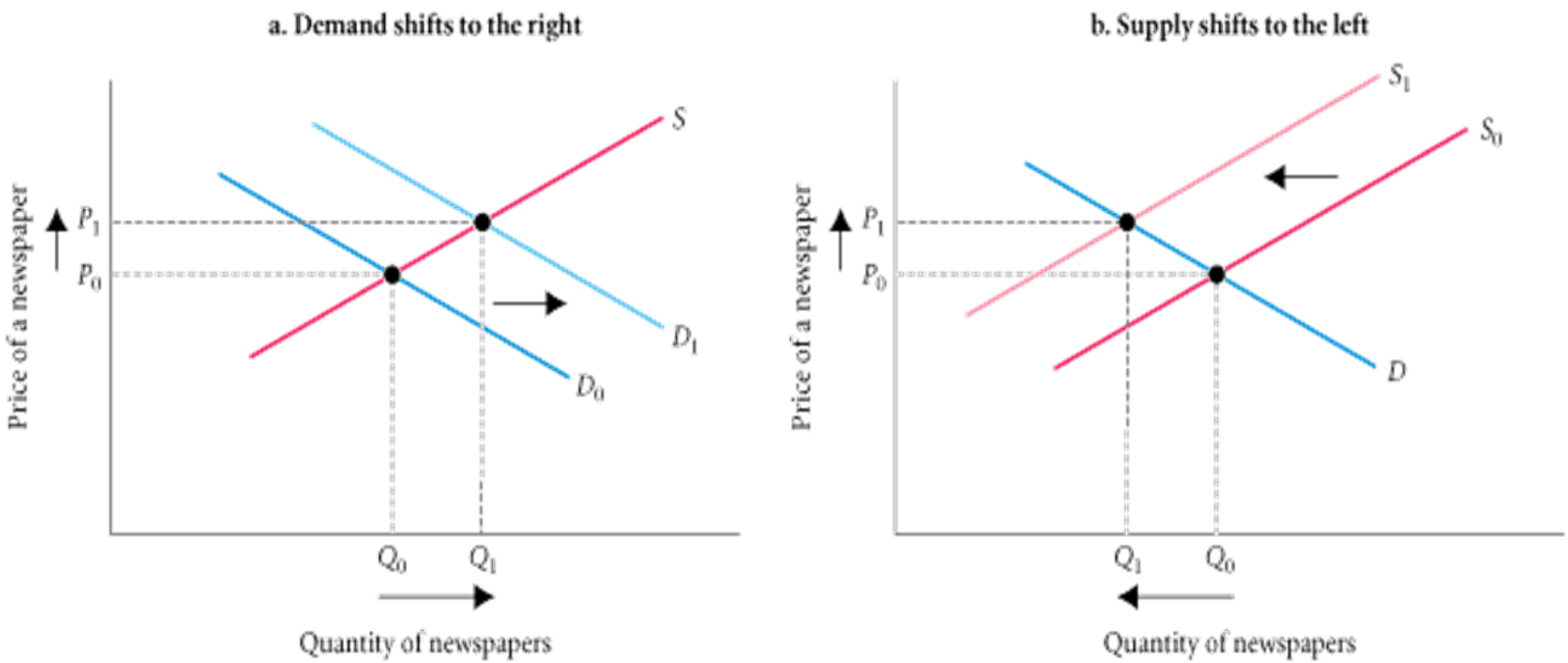
4. The supply of a good is determined by price, costs of production, and prices of related products. Costs of production are determined by available technologies of production and input prices.

5. Be careful to distinguish between movements along supply and demand curves and shifts of these curves. When the price of a good changes, the quantity of that good demanded or supplied changes—that is, a movement occurs along the curve. When any other factor changes, the curve shifts, or changes position.

6. Market equilibrium exists only when quantity supplied equals quantity demanded at the current price.

ECONOMICS IN PRACTICE

Why Do the Prices of Newspapers Rise?



In 2006, the average price for a daily edition of a Baltimore newspaper was \$0.50. In 2007, the average price had risen to \$0.75. Different analysts have different explanations for the higher equilibrium price.

Looking Ahead: Markets and the Allocation of Resources

- You can see how markets answer the basic economic questions of what is produced, how it is produced, and who gets what is produced:
  - Demand curves reflect what people are willing and able to pay for products; they are influenced by incomes, wealth, preferences, prices of other goods, and expectations.
  - Firms in business to make a profit have a good reason to choose the best available technology—lower costs mean higher profits.
  - When a good is in short supply, price rises. As it does, only those who are willing and able to continue buying do so.

REVIEW TERMS AND CONCEPTS *(1 of 2)*

- capital market
- complements, complementary goods
- demand curve
- demand schedule
- entrepreneur
- equilibrium
- excess demand, or shortage
- excess supply, or surplus
- factors of production
- firm
- households
- income
- inferior goods
- input or factor markets
- labor market
- land market
- law of demand
- law of supply

REVIEW TERMS AND CONCEPTS *(2 of 2)*

- market demand
- market supply
- movement along a demand curve
- movement along a supply curve
- normal goods
- perfect substitutes
- product or output markets
- Profit
- quantity demanded
- quantity supplied
- shift of a demand curve
- shift of a supply curve
- substitutes
- supply curve
- supply schedule
- wealth, or net worth