PRINCIPLES OF

MICROECONOMICS

ELEVENTH EDITION

CASE · FAIR · OSTER

PEARSON

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Demand, Supply, and Market Equilibrium

3

CHAPTER OUTLINE

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

product *or* output markets The markets in which goods and services are exchanged.

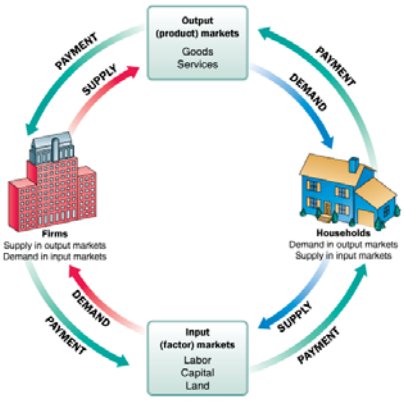
input *or* factor markets The markets in which the resources used to produce goods and services are exchanged.

▶ **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 Figure 3.1 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.



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.

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 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.

Which of the following is supplied by households in *factor markets*?

a. Labor.
b. Savings.
c. Land.
d. All of the above.
e. None of the above.

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Demand in Product/Output Markets

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.

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.

Changes in Quantity Demanded versus Changes in Demand

The most important relationship in individual markets is that between market price and quantity demanded.

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.

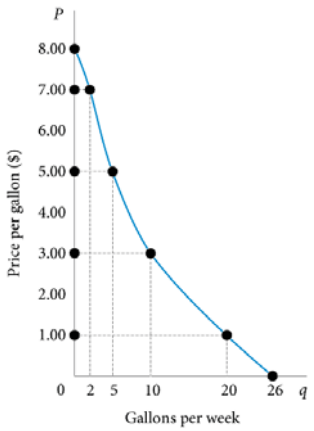
Price and Quantity Demanded: The Law of Demand

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.

Demand Curves Slope Downward

law of demand The negative relationship between price and quantity demanded: As price rises, quantity demanded decreases; as price falls, quantity demanded increases.

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*. Demand curves have a negative slope.

Fill in the blanks. It is reasonable to expect that quantity demanded will _____ when price rises, *ceteris paribus*, and that demand curves have a _____ slope.

a. rise; positive
b. rise; negative
c. fall; positive
d. fall; negative

Fill in the blanks. It is reasonable to expect that quantity demanded will _____ when price rises, *ceteris paribus*, and that demand curves have a _____ slope.

a. rise; positive
b. rise; negative
c. fall; positive
d. fall; negative

Other Properties of Demand Curves

1. They have a negative slope.
2. They intersect the quantity (*X*) axisa 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—whether it is steep or flat, whether it is bowed in or bowed out—depends on the unique tastes and preferences of the household and other factors.

That demand curves intersect both the price and the quantity axes is a matter of common sense. Which of the following explains that they intersect the price axis?

a. Time limitations and diminishing marginal utility.
b. Limited incomes and wealth.
c. The law of demand.
d. All of the above.

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Other Determinants of Household Demand

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.

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.

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.

ECONOMICS IN PRACTICE

Have You Bought This Textbook?

Recent work by Judy Chevalier and Austan Goolsbee1 discovered, even when instructors require particular texts, when prices are high students have found substitutes. Even in the textbook market student demand does slope down!

One might think that the total number of textbooks, used plus new, should match the class enrollment. After all, the text is required! In fact, what they found was the higher the textbook price, the more text sales fell below class enrollments.

THINKING PRACTICALLY

1. If you were to construct a demand curve for a required text in a course, where would that demand curve intersect the horizontal axis?
2. And this much harder question: In the year before a new edition of a text is published, many college bookstores will not buy the older edition. Given this *fact*, what do you think happens to the gap between enrollments and new plus used book sales in the year before a new edition of a text is expected?

Tastes and Preferences

Income, wealth, and prices of goods available are the three factors that determine the combinations of goods and services that a household is *able* to buy.

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. First, they are volatile. Second, tastes are idiosyncratic.

Expectations

What you decide to buy today certainly depends on today's prices and your current income and wealth.

There are many examples of the ways expectations affect demand.

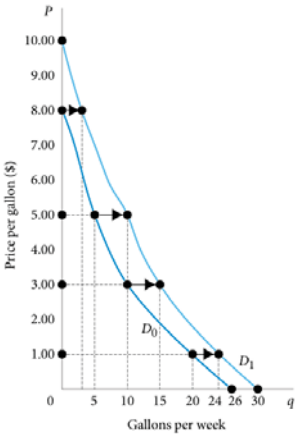
Increasingly, economic theory has come to recognize the importance of expectations.

It is important to understand that demand depends on more than just *current* incomes, prices, and tastes.

Shift of Demand versus Movement Along a Demand Curve

TABLE 3.2 Shift of Alex's Demand Schedule Due to Increase in Income

	Schedule D_0	Schedule D_1
Price (per Gallon)	Quantity Demanded (Gallons per Week at an Income of $500 per Week)	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 relationship between price and quantity is different; there is a *shift* of the demand curve, in this case from D_0 to D_1. Gasoline is a normal good.

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.

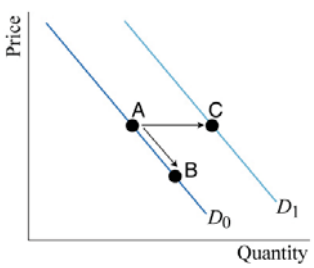
movement along a demand curve The change in quantity demanded brought about by a change in price.

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**).

Refer to the figure below. Which move illustrates the impact of a decrease in market price on market demand, all else the same?

a. The move from A to B.
b. The move from A to C.
c. Both moves show the same result on demand.
d. None of the above.



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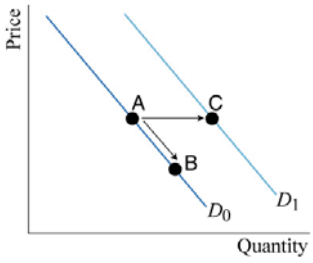
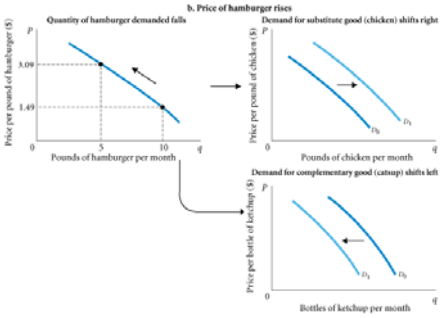


▲ **FIGURE 3.4 Shifts versus Movement Along a Demand Curve**

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 (continued)**

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.

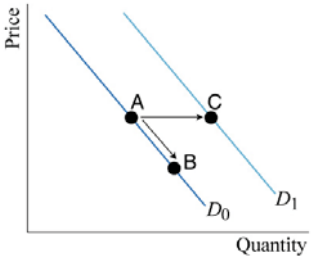
Refer to the figure below. Assume that TVs and VCRs are two complements and that the diagram below represents the demand for VCRs. Which move would best describe the impact of a decrease in the price of TVs on this diagram?

a. The move from A to B.

b. The move from A to C.

c. Both a and b above.

d. None of the above.



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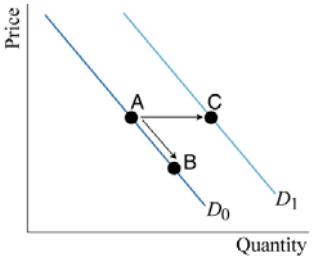
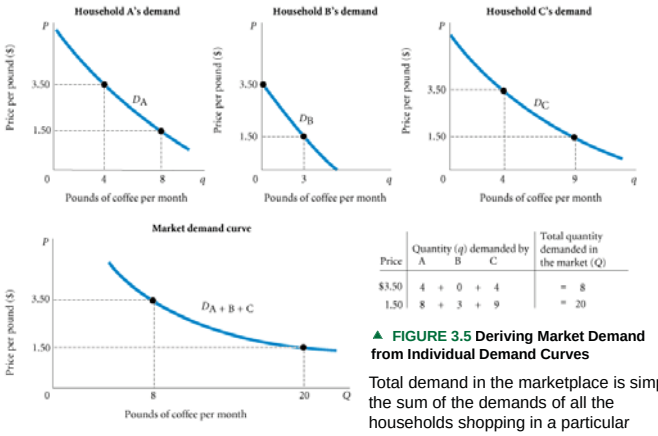
a. The move from A to B.

b. The move from A to C.

c. Both a and b above.

d. None of the above.





▲ **FIGURE 3.5 Deriving Market Demand from Individual Demand Curves**

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

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.

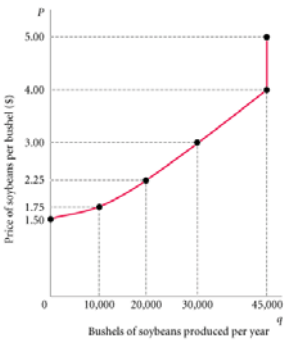
supply schedule A table showing how much of a product firms will sell at alternative prices.

law of supply The positive relationship between price and quantity of a good supplied: An increase in market price 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

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).

The Prices of Related Products

Assuming that its objective is to maximize profits, a firm's decision about what quantity of output, or product, 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.

The decision of a profit-maximizing firm about what quantity of output to supply depends on:

a. The price of the good or service.
b. The cost of producing the product.
c. The technologies that can be used to produce the product.
d. All of the above.

The decision of a profit-maximizing firm about what quantity of output to supply depends on:

a. The price of the good or service.
b. The cost of producing the product.
c. The technologies that can be used to produce the product.
d. All of the above.

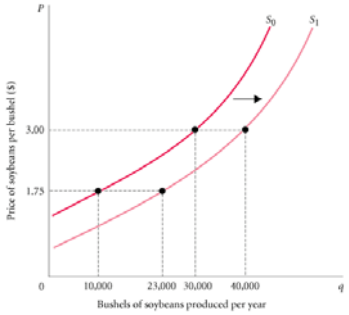
Shift of Supply versus Movement Along a Supply Curve

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

	Schedule S_0	Schedule S_1
Price (per Bushel)	Quantity Supplied (Bushels per Year Using Old Seed)	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*.

As with demand, 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**).

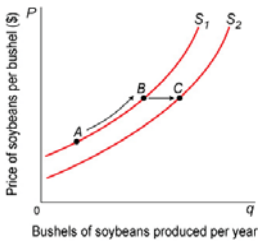
Change in costs, input prices, technology, or prices of related goods and services leads to
└→Change in *supply* (**shift of a supply curve**).

From Individual Supply to Market Supply

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

Refer to the figure below. Which of the following moves best describes what happens when a change in the price of soybeans affects market supply?

a. A move from A to B.
b. A move from A to C.
c. Either move from A to B or A to C.
d. A move from B to C.



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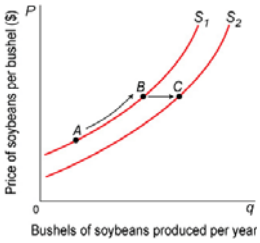
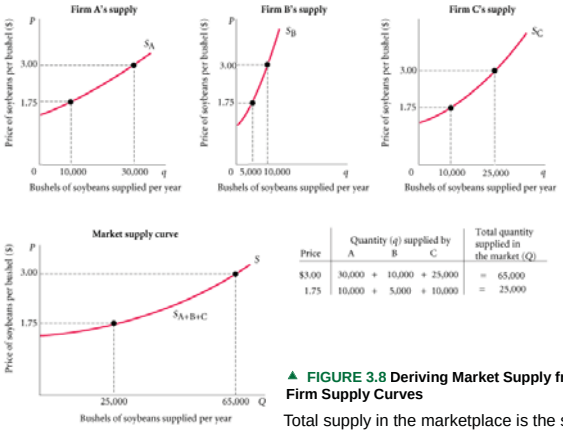




▲ **FIGURE 3.8 Deriving Market Supply from Individual Firm Supply Curves**

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.

Market Equilibrium

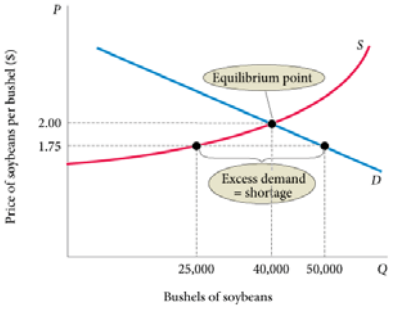
equilibrium The condition that exists when quantity supplied and quantity demanded are equal. At equilibrium, there is no tendency for price to change.

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.

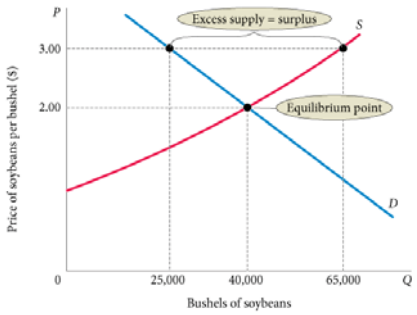


When quantity demanded exceeds quantity supplied, price tends to rise. When the price in a market rises, quantity demanded falls and quantity supplied rises until an equilibrium is reached at which quantity demanded and quantity supplied are equal.

Excess Supply

excess supply *or* surplus The condition that exists when quantity supplied exceeds quantity demanded at the current price.

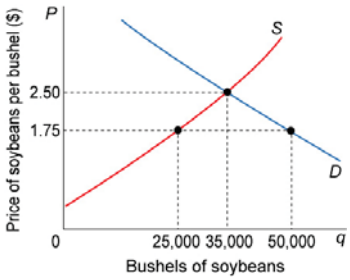
▶ **FIGURE 3.10 Excess Supply, or Surplus**
At a price of $3.00, quantity supplied exceeds quantity demanded by 20,000 bushels.
This excess supply will cause the price to fall.



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.

Refer to the figure below. When market price is $1.75, which of the following is correct?

a. There is excess supply.
b. There is a surplus.
c. Quantity demanded is greater than quantity supplied.
d. All of the above.



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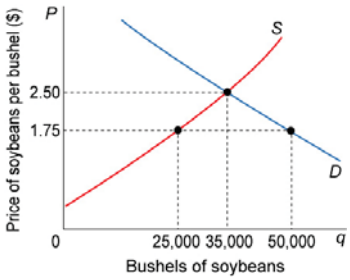
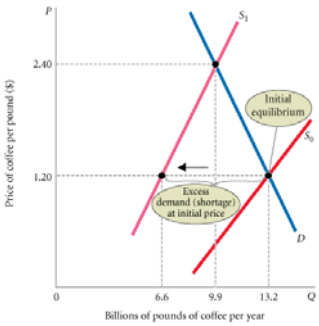
d. All of the above.



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

Coffee or Tea?

China is rapidly changing, and tea-drinking habits are no exception. Chinese consumers have discovered coffee!

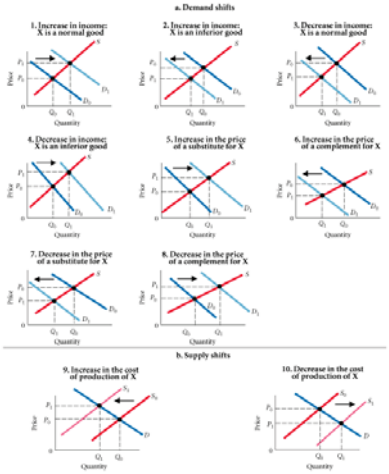
Some observers suggest that the fast pace of current day China is more compatible with coffee drinking than tea. Perhaps coffee drinking is a complement to economic growth?

With new and large populations now interested in coffee, the world demand for coffee shifts rightward. This is good news for coffee growers. As you already know from this chapter, however, how good that news really is from the point of view of coffee prices depends on the supply side as well!

THINKING PRACTICALLY

1. Show in a graph the effect that the growth in China's interest in coffee will likely have on coffee prices? What features of supply determine how big the price increase will be?

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



Which of the following situations leads to a lower equilibrium price?

a. An increase in demand, without a change in supply.
b. A decrease in supply accompanied by an increase in demand.
c. A decrease in supply, without a change in demand.
d. A decrease in demand accompanied by an increase in supply.
e. An increase in demand accompanied by an increase in supply.

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c. A decrease in supply, without a change in demand.
d. A decrease in demand accompanied by an increase in supply.
e. An increase in demand accompanied by an increase in supply.

Demand and Supply in Product Markets: A Review

Here are some important points to remember about the mechanics of supply and demand in product markets:

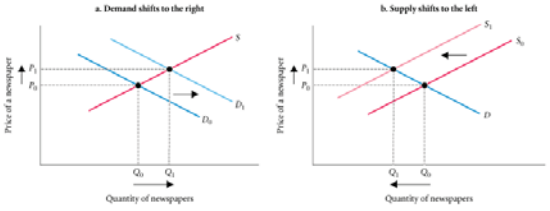
1. A demand curve shows how much of a product a household would buy if it could buy all it wanted at the given price. A supply curve shows how much of a product a firm would supply if it could sell all it wanted at the given price.
2. Quantity demanded and quantity supplied are always per time period—that 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.

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.



Looking Ahead: Markets and the Allocation of Resources

You can already begin to 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; demand curves 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, those who are willing and able to continue buying do so; others stop buying.

REVIEW TERMS AND CONCEPTS

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
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