

## Demand, Supply, and Market Equilibrium

### (CFO, Chapter 3)

Outline of today's course:

1. Basic Decision Making Units
2. Input and Output Markets: The Circular Flow
3. Demand in Output Markets
4. Supply in Output Markets
5. Market Equilibrium

### 1. Decision Making Units

There are **two basic decision making units** in a market system:

- **Firms** (*primary producing units in an economy*)
- **Households** (*primary consuming units in an economy*)

**A firm** An organization that transforms resources (inputs) into products (outputs). Firms are the primary producing units in a market economy.

**An entrepreneur** is one *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.*

**Household** is all of the people *who live under one roof and who make joint financial decisions.* The consuming units in an economy are households

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## 2. Circular Flow

*Households and firms interact in*

- **Output (or product) markets:** markets in which goods and services are exchanged.
  - *In output markets, firms supply and households demand*
- **Input (or factor) markets:** markets in which the resources used to produce products are exchanged..
  - *In input markets, households supply and firms demand*

### **Input (Factor) Markets:**

1. *Labor Market:* Input market in which the *households supply work for wages to firms that demand labor.*
2. *Capital Market:* Input market in which households **supply their savings**, for interest or for claims to future profits, to firms that demand funds to buy capital goods.
3. *Land Market:* Input market in which households **supply land or other real property** to firms in exchange for rent.

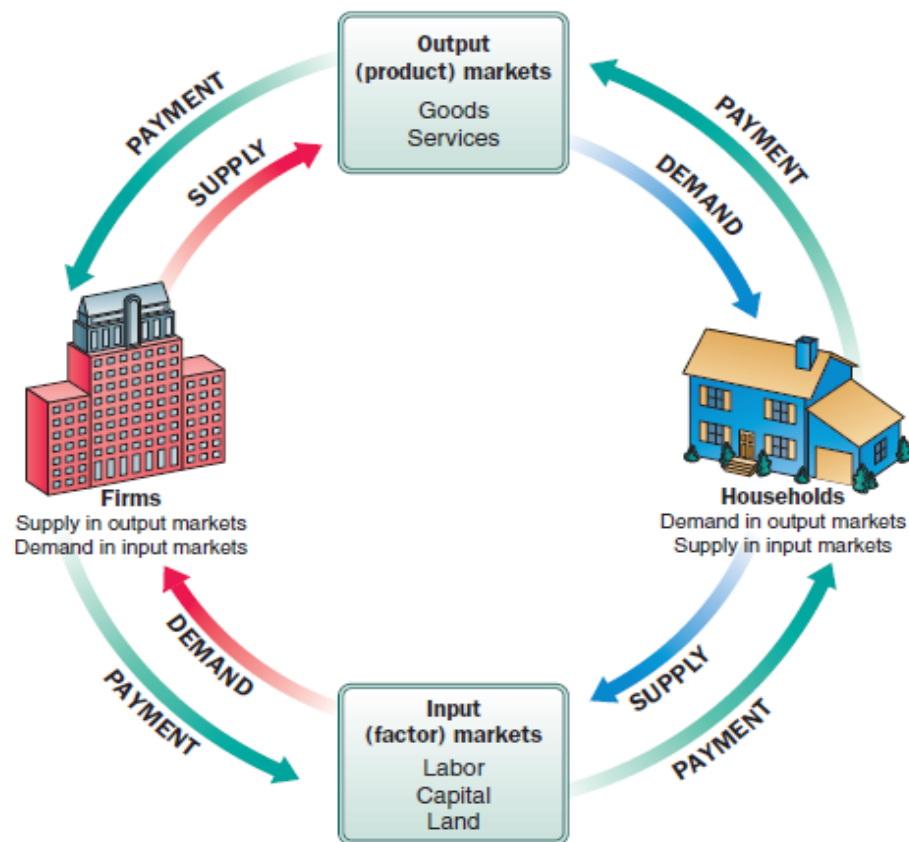
### **Factors of Production:**

- a. Land,
- b. Labor, and
- c. Capital

are the *three key* factors of production.

Now let us draw the *Circular Flow diagram* of an economy:

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▲ FIGURE 3.1 The Circular Flow of Economic Activity

In the circular flow diagram:

- Goods and services flow clockwise:
  - Labor services supplied by HH flows to firms.
  - Goods and services produced by Firms flow to HH.
- Payment (usually money) flows *counterclockwise*:
  - Payment for goods and services flows from HH to Firms.
  - Payment for labor services flows from Firms to HH.

Hence, we see that:

- Input and Output Markets *are connected* through the *behaviour* of both *Firms and Households*.

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### 3. Demand in Output Markets

A household's decision about what quantity of a particular output to demand depends on

1. *Price of the product in question* ( $P_X$ )
2. *Prices of other related*
  - a. *substitutes products*– ( $P_s$ )
  - b. *complements products* – ( $P_c$ )
3. *Income available to the household* –( $Y$ )
4. Household's amount of *accumulated wealth* –( $W$ )
5. Household's *tastes and preferences* –( $T$ )
6. Household's *expectations about future income, wealth & prices*-( $E$ )

Or mathematically, quantity demanded ( $Q_d$ ) is as follows;

$Q_d = f(P_X, P_s, P_c, Y, W, T, E)$ <p style="text-align: center;">(-) (+) (-) (+) (+) (+/-) (+/-)</p>
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**Quantity demanded:** Amount of a product that a household is *willing and able to buy* at a given price (in a given period of time).

**Demand:** Relationship between quantity demanded and price.

#### **Changes in *Quantity Demanded* vs *Changes in Demand***

- *Changes in own price* affect *the quantity demanded* per period.
- *Changes in income, wealth, other prices, tastes, or expectations* affect *demand*.

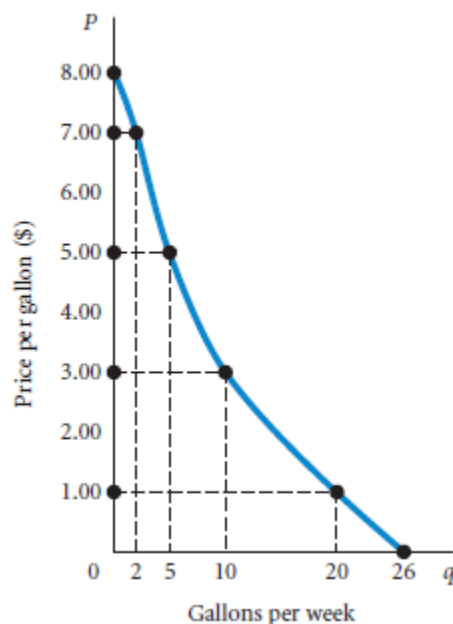
**Demand schedule:** A table showing how much of a given product a household would be willing to buy at different prices.

**Demand curve:** A graph illustrating how much of a given product a household would be willing to buy at different prices.

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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



*Demand Curves Slope Downward:*

- They have a negative slope. An increase in price is likely to lead to a decrease in quantity demanded, and a decrease in price is likely to lead to an increase in quantity demanded. In other words, there is a negative relationship between price and quantity demanded:

- As price rises, quantity demanded decreases.
- As price falls, quantity demanded increases.

- This is called the “**Law of Demand**” in Economics

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Two additional things are notable

- Demand curves intersect the price (Y) axis, a result of limited incomes and wealth.
- Demand curves intersect the quantity (X) axis, a result of time limitations and *diminishing marginal utility*.
  - *diminishing marginal utility*: Each successive unit of a good worth less to me.
  - Utility I get from the second ice cream is likely to be less than the utility I get from the first one.

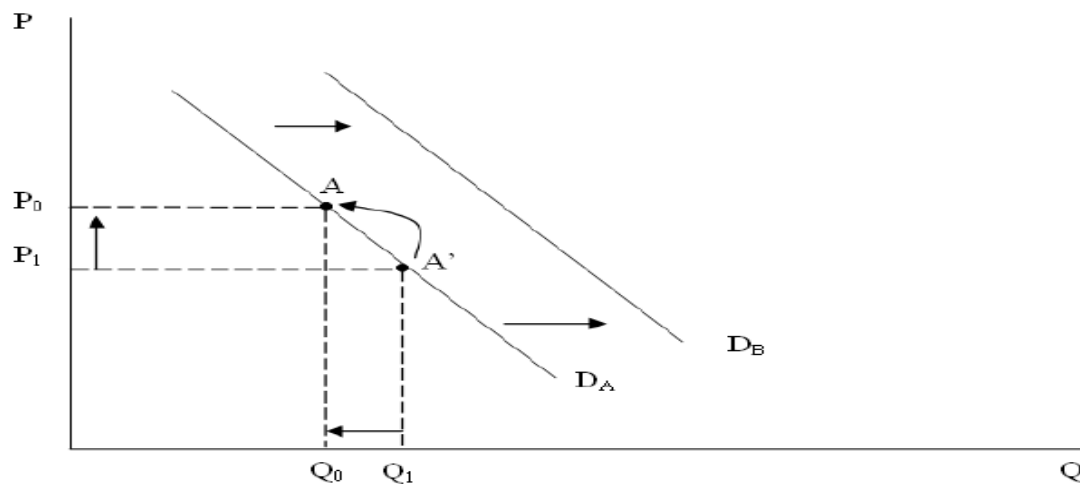
Shift of Demand Versus Movement Along A Demand Curve

- A change in **demand** is not the same as a change in **quantity demanded**.
  - A higher price causes lower **quantity demanded** and a move along the demand curve  $D_A$ . (*Movement along the curve*)
  - Changes in determinants of demand, other than price, cause a change in **demand**, or a **shift** of the entire demand curve, from  $D_A$  to  $D_B$ . (*Change in Demand*)

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).

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## Other determinants of household demand

### 1. Income and Wealth

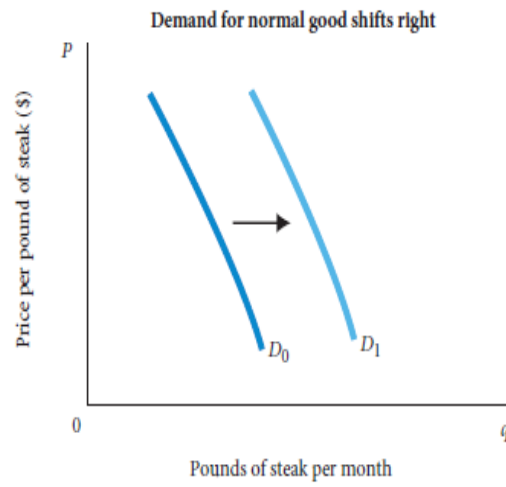
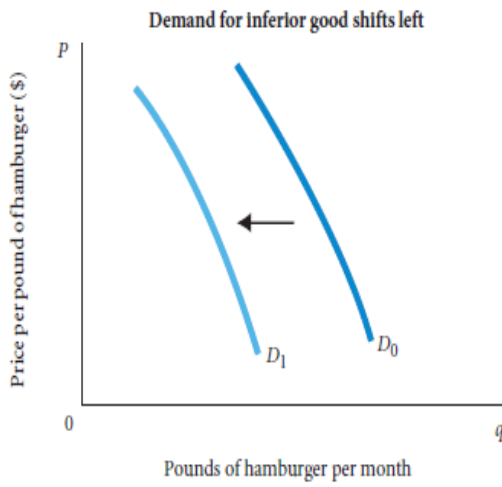
- **Income:** Sum of all a household's wages, salaries, profits, interest payments, rents, and other forms of earnings in a given period of time.
  - It is a flow measure.
- **Wealth:** Total value of what a household owns minus what it owes.
  - It is a stock measure.

**Normal goods:** Goods for which demand increases when income increases and for which demand falls when income falls.

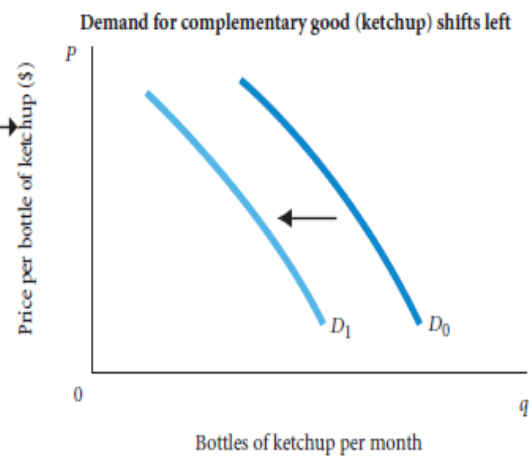
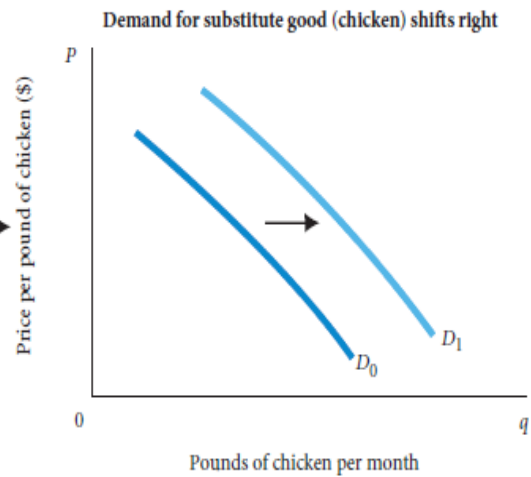
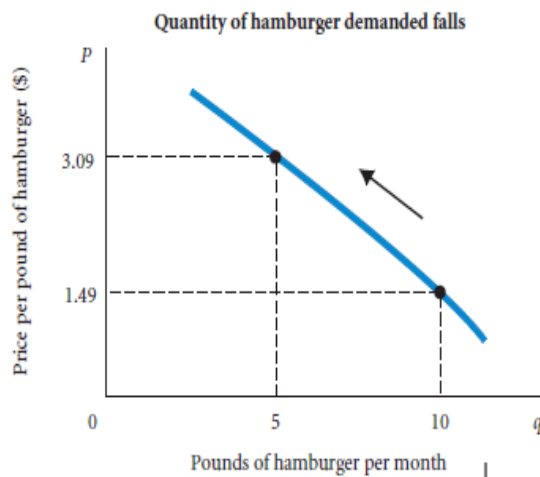
**Inferior goods:** Goods for which demand falls when income rises.

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a. Income rises



b. Price of hamburger rises





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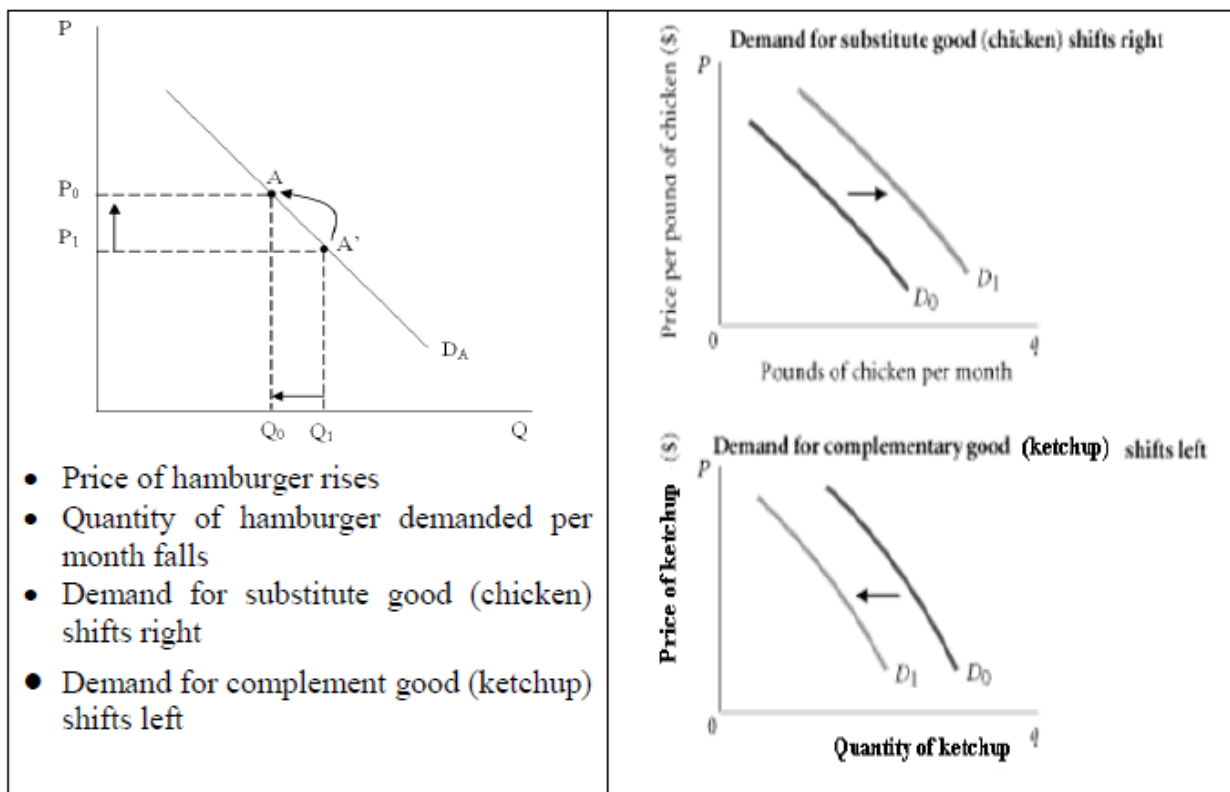
2. Prices of Other Goods and Services

**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 causes an increase in demand for the other, and vice versa.



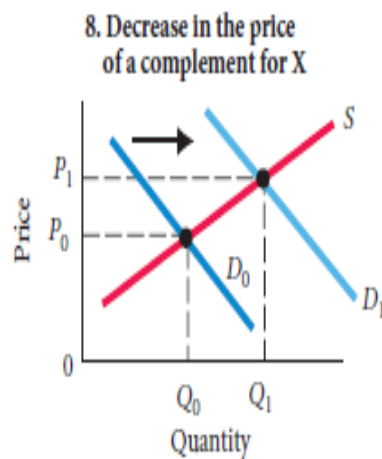
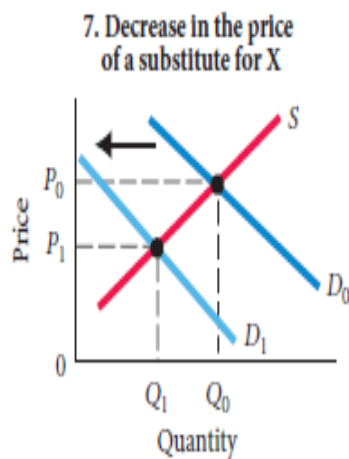
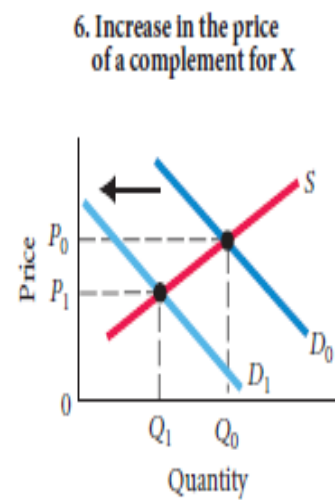
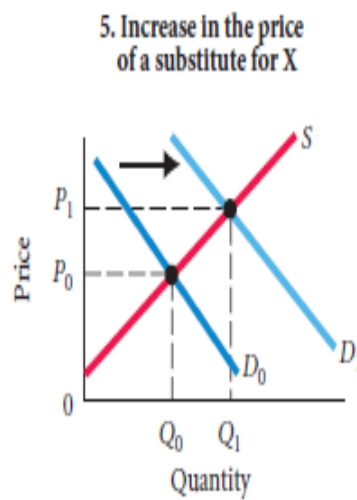
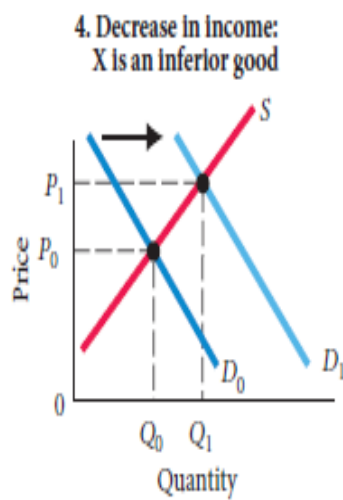
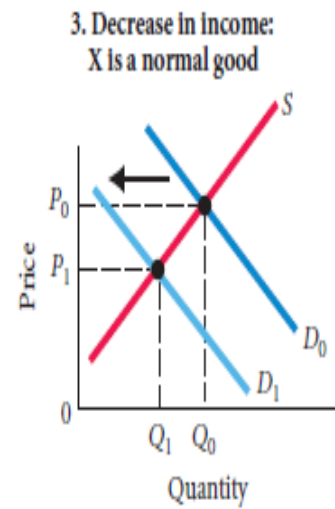
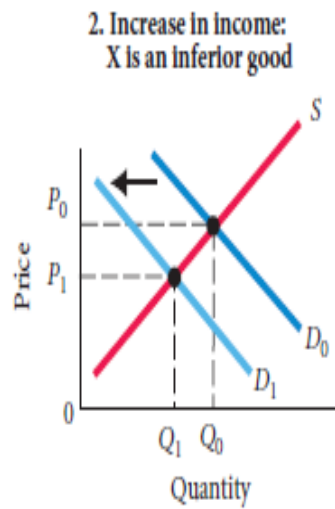
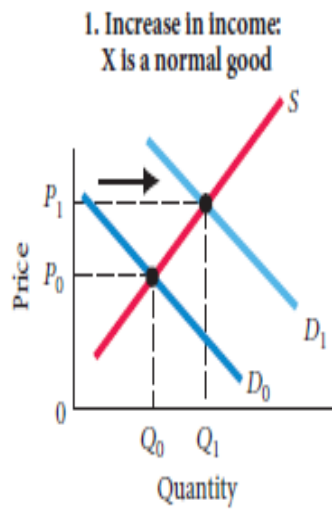
3. Tastes and Preferences

- Diverse

4. Expectations

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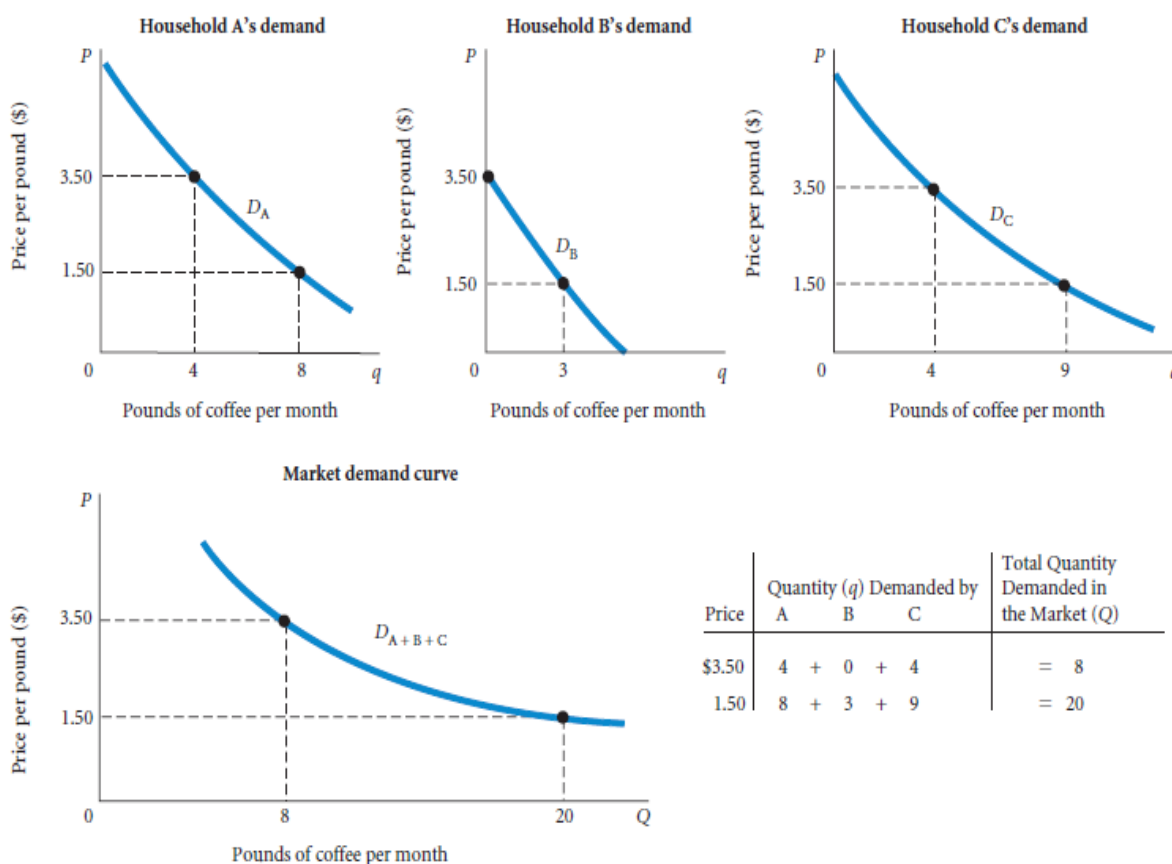
a. Demand shifts



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From Household Demand to Market Demand

- **Market demand** is 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.
- Assuming there are only three households in the market, market demand is derived as follows:



▲ FIGURE 3.5 Deriving Market Demand from Individual Demand Curves

## Supply in Product/Output Markets

### 1. Supply in Output Markets

- Supply decisions depend on profit potential.
- Profit is the difference between revenues and costs.

$$\text{Profit} = \text{Total Revenue (TR)} - \text{Total cost (TC)}$$

- Factors that affect supply
  - Price of the good (X1)
  - Prices of related products (X2)
  - Cost of Production which depends on (X3)
    - Prices of inputs (land, labor, capital), and
    - Technology of production
      - Regardless of the price that a firm can command for its product, revenue must exceed the cost of producing the output for the firm to make a profit.

- Mathematically;

$$Q_s = g(X_1, X_2, X_3)$$

**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.

#### Law of supply :

- 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.

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**Supply schedule:** A table showing how much of a product firms will sell at different prices.

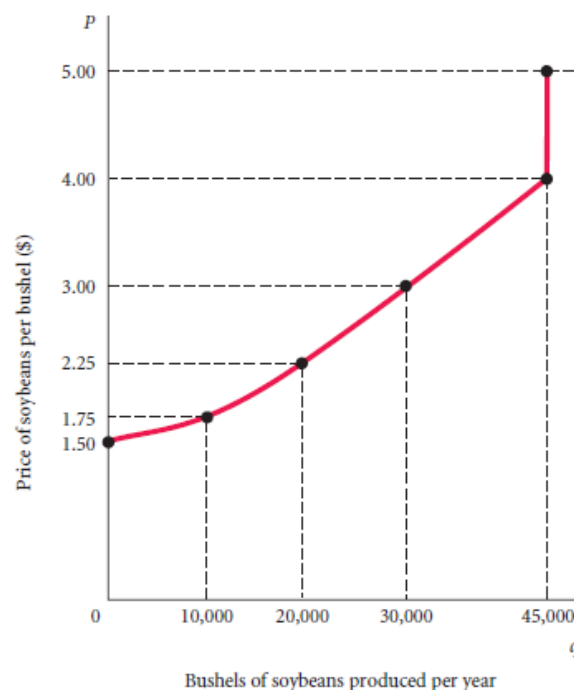
**TABLE 3.3** Clarence Brown's Supply Schedule for Soybeans

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

**Supply curve:** A graph illustrating how much of a product a firm will sell at different prices.

**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.



- A producer will supply more when the price of output is higher.
- Slope of supply curve is positive

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**Shift of Supply Versus Movement Along a Supply Curve**

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):

**Movement along a supply curve:** Change in quantity supplied brought about by a change in price.

**Shift of a supply curve** 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.

**Change in price of a good or service**

leads to

Change in *quantity supplied* (movement along a supply curve).

**Change in income, preferences, or prices of other goods or services**

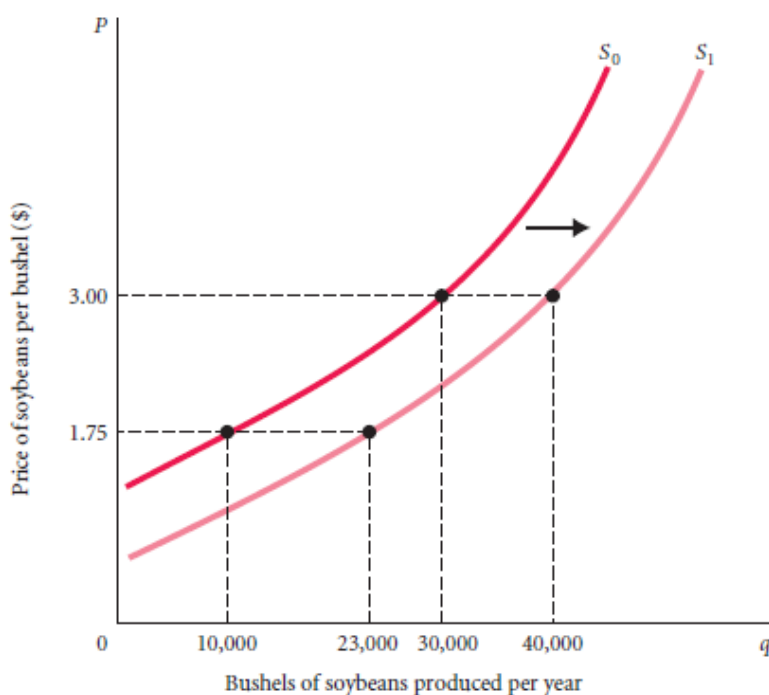
leads to

Change in *supply* (shift of a supply curve).

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

Price (per Bushel)	Schedule $S_0$	Schedule $S_1$
	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



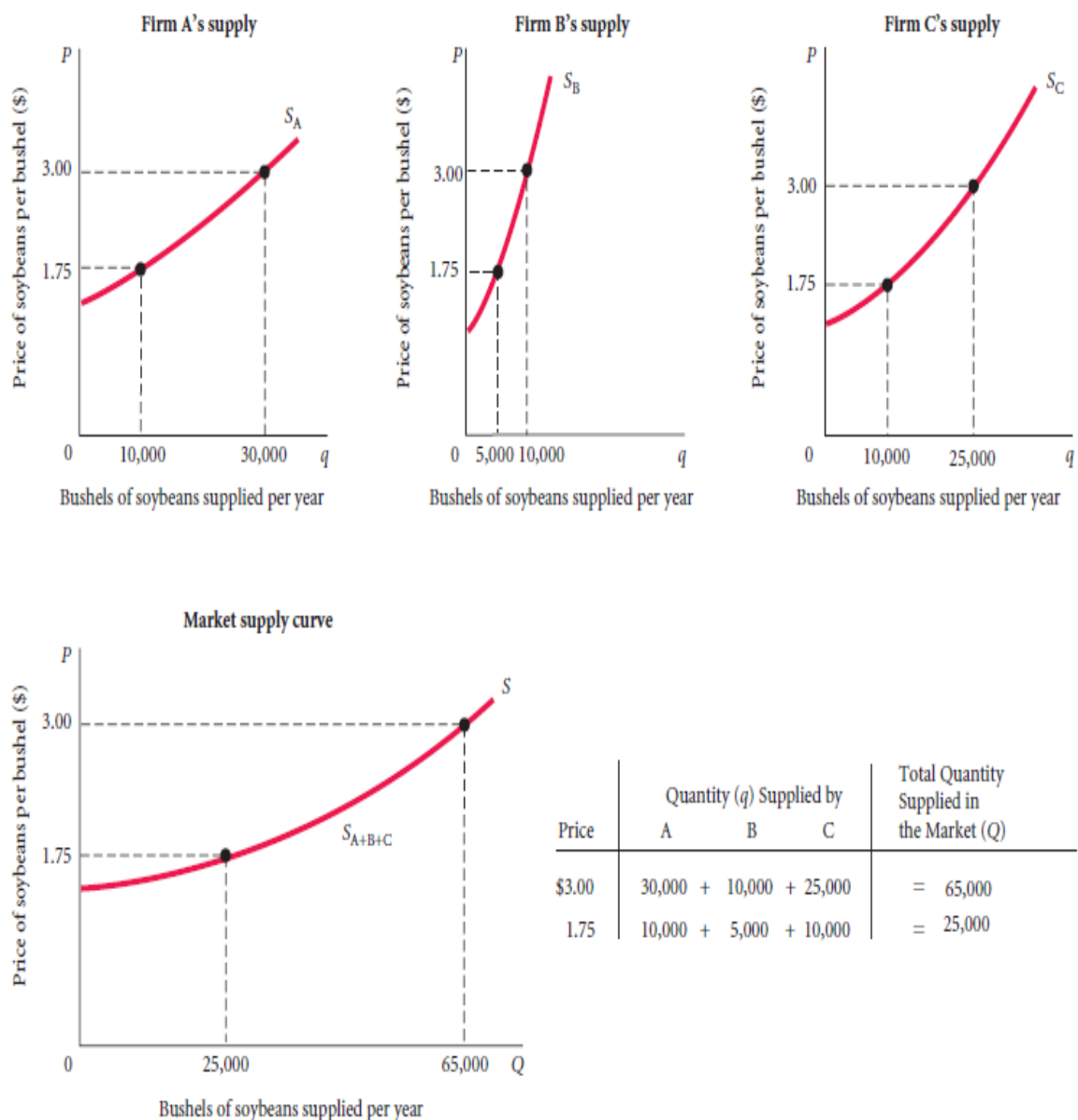
**▲ FIGURE 3.7** Shift of the Supply Curve for Soybeans Following Development of a New Seed Strain

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*.

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From Individual Supply to Market Supply

**Market supply:** 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.



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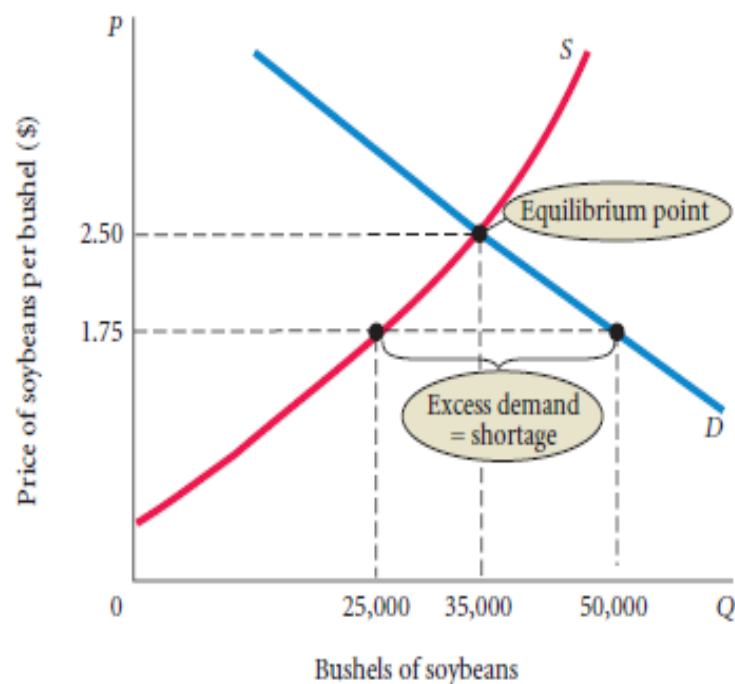
## Market Equilibrium

### *Equilibrium*

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

### **Excess demand (shortage)**

- Condition that exists when quantity demanded exceeds quantity supplied at the current price.
  - Bidding at an auction starts with excess demand and ends up with quantity demanded and quantity supplied equal.



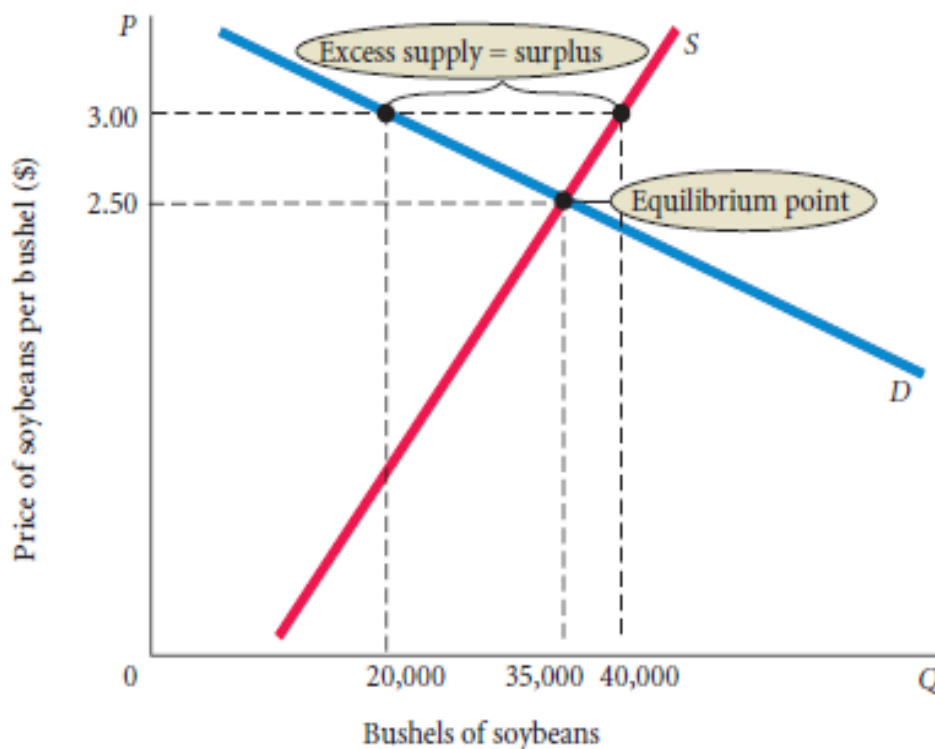
▲ FIGURE 3.9 Excess Demand, or Shortage

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- 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 (surplus)**

- Condition that exists when quantity supplied exceeds quantity demanded at the current price.

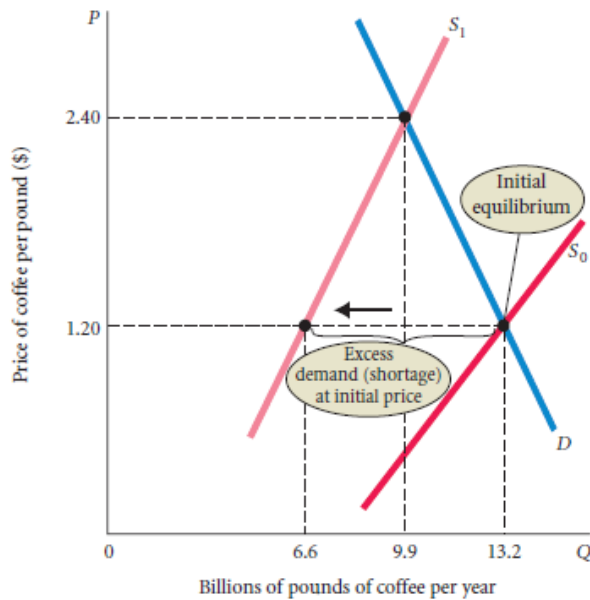


- When quantity supplied exceeds quantity demanded at the current price, the price tends to fall.
  - When price falls, quantity supplied is likely to decrease and quantity demanded is likely to increase
    - until an equilibrium price is reached where quantity supplied and quantity demanded are equal.

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Changes in Equilibrium

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

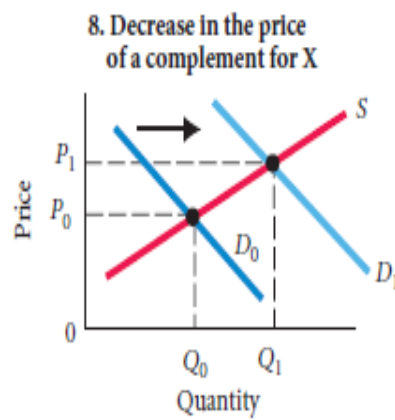
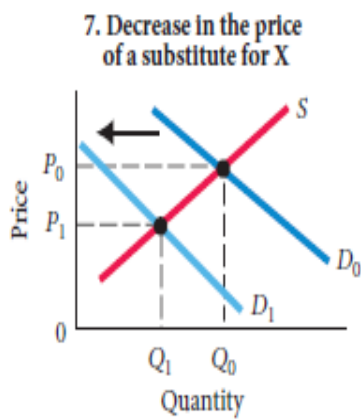
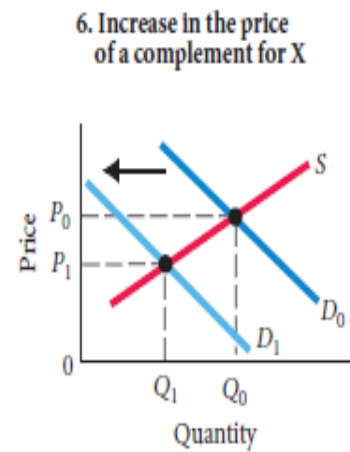
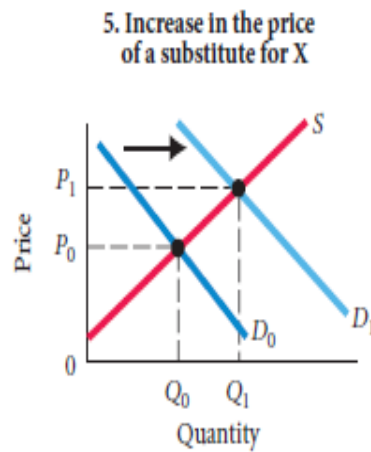
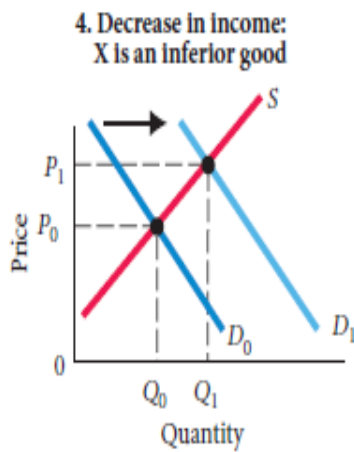
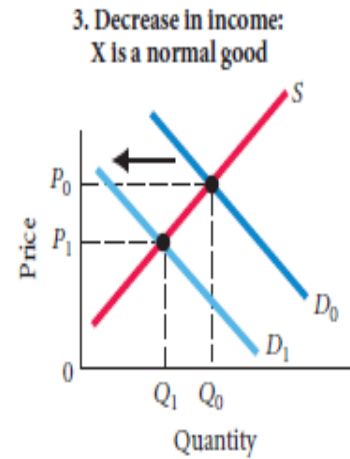
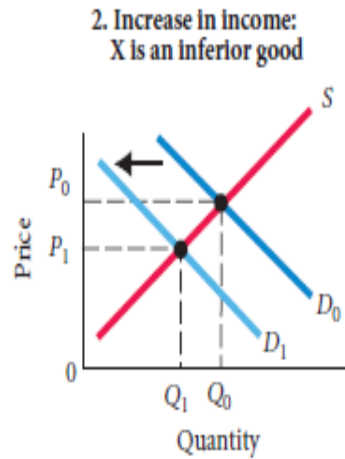
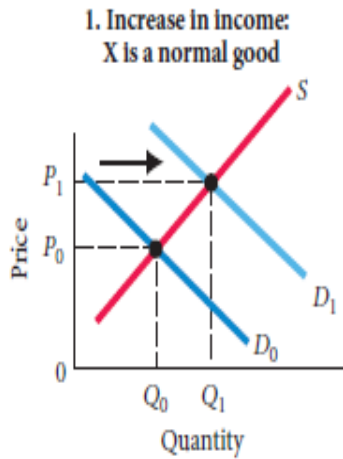


◀ **FIGURE 3.11**  
**The Coffee Market:**  
**A Shift of Supply**  
**and Subsequent**  
**Price Adjustment**  
Before the freeze, the coffee market was in equilibrium at a price of \$1.20 per pound. At that price, quantity demanded equaled quantity supplied. The freeze shifted the supply curve to the left (from  $S_0$  to  $S_1$ ), increasing the equilibrium price to \$2.40.

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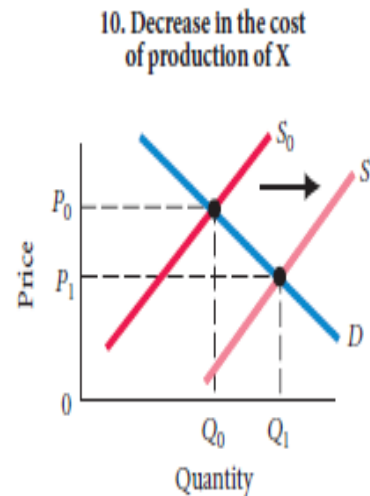
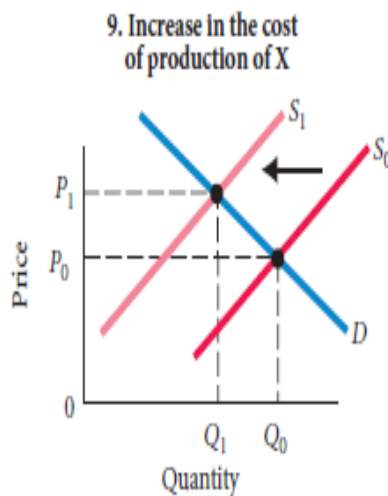
Examples of Supply and Demand Shifts for Product X

a. Demand shifts



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b. Supply shifts



## 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.