

Notes for Lecture - 3

22 August 2023 21:25

The 3 Central Problems of an Economy

The basic problems that every economy must solve: What shall be produced? How shall goods be produced? And for whom should goods be produced?

The modern mixed economy relies primarily on a system of markets and prices to solve the three central problems.

The fundamental building blocks of an economy are the dual monarchy of tastes and technology

Markets are like the weather—sometimes stormy, sometimes calm, but always changing. Yet a careful study of markets will reveal certain forces underlying the apparently random movements.

To forecast prices and outputs in individual markets, you must first master the analysis of supply and demand.

Economics has a very powerful tool for explaining such changes in the economic environment. It is called the theory of supply and demand. This theory shows how consumer preferences determine consumer demand for commodities, while business costs are the foundation of the supply of commodities.

The same is true for every market, from Internet stocks to diamonds to land: changes in supply and demand drive changes in output and prices.

We begin with demand curves and then discuss supply curves. Using these basic tools, we will see how the market price is determined where these two curves intersect—where the forces of demand and supply are just in balance. It is the movement of prices—the price mechanism—which brings supply and demand into balance or equilibrium.

THE DEMAND SCHEDULE

The higher the price of an article, other things held constant, the fewer units consumers are willing to buy. The lower its market price, the more units of it are bought.

There exists a definite relationship between the market price of a good and the quantity demanded of that good, other things held constant. This relationship between price and quantity bought is called the demand schedule, or the demand curve.

Table 3-1 presents a hypothetical demand schedule for cornflakes. At each price, we can determine the quantity of cornflakes that consumers purchase.

Demand Schedule for Cornflakes		
	(1) Price (\$ per box) <i>P</i>	(2) Quantity demanded (millions of boxes per year) <i>Q</i>
A	5	9
B	4	10
C	3	12
D	2	15
E	1	20

TABLE 3-1. The Demand Schedule Relates Quantity Demanded to Price

At each market price, consumers will want to buy a certain quantity of cornflakes. As the price of cornflakes falls, the quantity of cornflakes demanded will rise.

THE DEMAND CURVE

The graphical representation of the demand schedule is the **demand curve**.

We show the demand curve in Figure 3-2, which graphs the quantity of cornflakes demanded on the horizontal axis and the price of cornflakes on the vertical axis.

Note that quantity and price are inversely related; that is, Q goes up when P goes down. The curve slopes downward, going from northwest to southeast. This important property is called **the law of downward-sloping demand**. It is based on common sense as well as economic theory and has been empirically tested and verified for practically all commodities

Law of downward-sloping demand: When the price of a commodity is raised (and other things are held constant), buyers tend to buy less of the commodity. Similarly, when the price is lowered, other things being constant, quantity demanded increases.

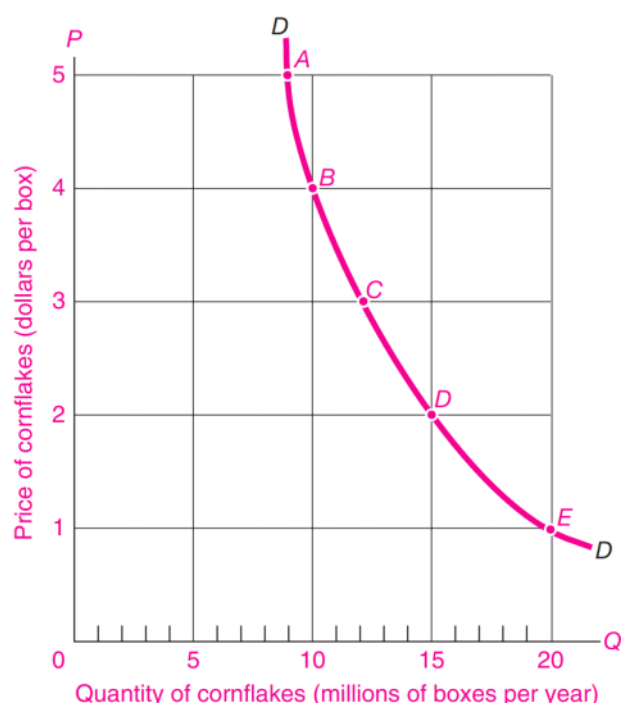


FIGURE 3-2. A Downward-Sloping Demand Curve Relates Quantity Demanded to Price

In the demand curve for cornflakes, price (P) is measured on the vertical axis while quantity demanded (Q) is measured on the horizontal axis. Each pair of (P , Q) numbers from Table 3-1 is plotted as a point, and then a smooth curve is passed through the points to give us a demand curve, DD . The negative slope of the demand curve illustrates the law of downward-sloping demand.

Quantity demanded tends to fall as price rises for two reasons:

1. First is **the substitution effect**, which occurs because a good becomes relatively more expensive when its price rises. When the price of good A rises, I will generally substitute goods B, C, D, . . . for it. For example, as the price of wheat rises, I eat more rice.
2. A higher price generally also reduces quantity demanded through **the income effect**. This comes into play because when a price goes up, I find myself somewhat poorer than I was before. If petrol prices double, I have in effect less real income, so I will naturally curb my consumption of petrol and other goods.

Market Demand

Our discussion of demand has so far referred to “the” demand curve. But whose demand is it? Mine? Yours? Everybody’s?

The fundamental building block for demand is individual preferences. However, we will mostly focus on **the market demand**, which **represents the sum total of all individual demands**. The market demand is what is observable in the real world.

The market demand curve is found by adding together the quantities demanded by all individuals at each price.

Does the market demand curve obey the law of downward-sloping demand?

It certainly does. If prices drop, for example, the lower prices attract new customers through the substitution effect. In addition, a price reduction will induce extra purchases of goods by existing consumers through both the income and the substitution effects. Conversely, a rise in the price of a good will cause some of us to buy less.

Forces behind the Demand Curve

A whole array of factors influences how much will be demanded at a given price: average levels of income, the size of the population, the prices and availability of related goods, individual and social tastes, and special influences.

- The **average income of consumers** is a key determinant of demand. As people's incomes rise, individuals tend to buy more of almost everything, even if prices don't change. Automobile purchases tend to rise sharply with higher levels of income.
- The **size of the market —measured, say, by the population**—clearly affects the market demand curve. Uttar Pradesh's 23.56 Crores people tend to buy many times more goods and services than do Kerala's 3.56 Crores people.
- The **prices and availability of related goods** influence the demand for a commodity. **Substitute goods**—ones that tend to perform the same function, such as cornflakes and oatmeal, pens and pencils, small cars and large cars, or oil and natural gas. Demand for good A tends to be low if the price of substitute product B is low. (For example, as computer prices fell, what do you think happened to the demand for typewriters?)
- In addition to these objective elements, there is a set of subjective elements called **tastes or preferences**. Tastes represent a variety of cultural and historical influences. They may reflect genuine psychological or physiological needs; And they may include artificially contrived cravings; They may also contain a large element of tradition or religion.
- Finally, **special influences like seasonality** will affect the demand for particular goods. The demand for umbrellas is high in rainy season; the demand for air conditioners will rise in hot weather; the demand for automobiles will be low in Mumbai, where public transportation is plentiful and parking is a nightmare.

The determinants of demand are summarized in Table 3-2, which uses automobiles as an example.

Factors affecting the demand curve	Example for automobiles
1. Average income	As incomes rise, people increase car purchases.
2. Population	A growth in population increases car purchases.
3. Prices of related goods	Lower gasoline prices raise the demand for cars.
4. Tastes	Having a new car becomes a status symbol.
5. Special influences	Special influences include availability of alternative forms of transportation, safety of automobiles, expectations of future price increases, etc.

TABLE 3-2. Many Factors Affect the Demand Curve

Shifts in Demand

When there are **changes in factors other than a good's own price** which affect the quantity purchased, we call these changes **shifts in demand**. Demand increases (or decreases) when the quantity demanded at each price increases (or decreases).

As economic life evolves, demand changes incessantly. Demand curves sit still only in textbooks. Why does the demand curve shift? Because influences other than the good's price change; a change in a nonprice variable shifts the demand curve.

An increase in demand is illustrated in Figure 3-4 as a rightward shift in the demand curve. Note that the shift means that more cars will be bought at every price.

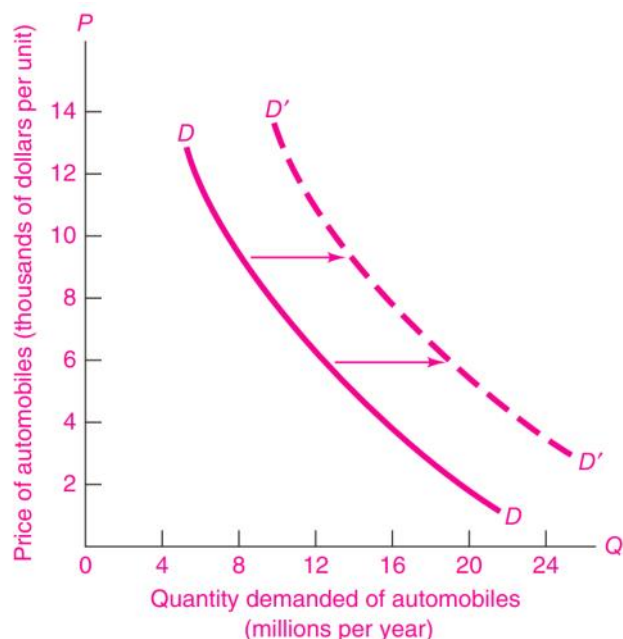


FIGURE 3-4. Increase in Demand for Automobiles

As elements underlying demand change, the demand for automobiles is affected. Here we see the effect of rising average income, increased population, and lower gasoline prices on the demand for automobiles. We call this shift of the demand curve an increase in demand.

Movements along Curves versus Shifts of Curves

One of the most important points that you must understand in economics is the difference between movements along a curve and shifts of a curve. In the present case, do not confuse a **change in demand** (which denotes a shift of the demand curve) with a **change in the quantity demanded** (which means moving along, or moving to a different point, on the same demand curve after a price change).

A change in demand occurs when one of the elements underlying the demand curve shifts. Take the case of pizzas. Suppose incomes increase and people want to spend part of their extra income on pizzas for a given pizza price. In other words, higher incomes will increase demand and shift the demand curve for pizzas out and to the right. This is a shift in the demand for pizzas.

By contrast, suppose that a new technology reduces pizza costs and prices. This leads to a change in quantity demanded that occurs because consumers tend to buy more pizzas as pizza prices fall, all other things remaining constant. Here, the increased purchases result not from an increase in demand but from the pizza-price decrease. This change represents a movement along the demand curve, not a shift of the demand curve.

THE SUPPLY CURVE

The supply side of a market typically involves the terms on which businesses produce and sell their products. The supply of tomatoes tells us the quantity of tomatoes that will be sold at each tomato price. More precisely, the supply schedule relates the quantity supplied **of a good to its market price**, other things constant. In considering supply, the **other things** that are **held constant** include **input prices, prices of related goods, and government policies**.

The supply schedule (or supply curve) for a commodity shows the relationship between its market price and the amount of that commodity that producers are willing to produce and sell, other things held constant.

THE SUPPLY CURVE

Table 3-3 shows a hypothetical supply schedule for cornflakes, and Figure 3-5 plots the data from the table in the form of a supply curve.

Supply Schedule for Cornflakes		
	(1) Price (\$ per box) P	(2) Quantity supplied (millions of boxes per year) Q
A	5	18
B	4	16
C	3	12
D	2	7
E	1	0

TABLE 3-3. Supply Schedule Relates Quantity Supplied to Price

The table shows, for each price, the quantity of cornflakes that cereal makers want to produce and sell. Note the positive relation between price and quantity supplied.

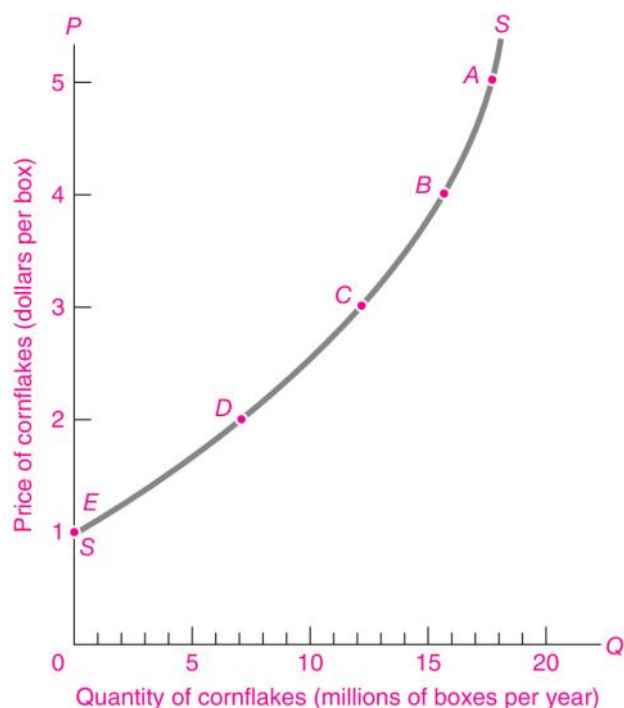


FIGURE 3-5. Supply Curve Relates Quantity Supplied to Price

The supply curve plots the price and quantity pairs from Table 3-3. A smooth curve is passed through these points to give the upward-sloping supply curve, SS .

These data show that at a cornflakes price of \$1 per box, no cornflakes at all will be produced. At such a low price, breakfast cereal manufacturers might want to devote their factories to producing other types of cereal. As the price of cornflakes increases, ever more cornflakes will be produced. At ever-higher cornflakes prices, cereal makers will find it profitable to add more workers and to buy more automated cornflakes-stuffing machines and even more cornflakes factories. All these will increase the output of cornflakes at the higher market prices.

Figure 3-5 shows the typical case of an upward sloping supply curve for an individual commodity. **One important reason for the upward slope is “the law of diminishing returns”** (a concept we will learn more about later). Wine will illustrate this important law. If society wants more wine, then additional labor will have to be added to the limited land sites suitable for producing wine grapes. Each new worker will be adding less and less extra product. The price needed to coax out additional wine output is therefore higher. By raising the price of wine, society can persuade wine producers to produce and sell more wine; the supply curve for wine is therefore upward sloping. Similar reasoning applies to many other goods as well.

Forces behind the Supply Curve

In examining the forces determining the supply curve, the fundamental point to grasp is that producers supply commodities for profit and not for fun or charity. One major element underlying the supply curve is **the cost of production**. When production costs for a good are low relative to the market price, it is profitable for producers to supply a great deal. When production costs are high relative to price, firms produce little, switch to the production of other products, or may simply go out of business.

Production costs are primarily determined by the **prices of inputs** and **technological advances**. The prices of inputs such as labor, energy, or machinery obviously have a very important influence on the cost of producing a given level of output.

An equally important determinant of production costs is **technological advances**, which consist of changes that lower the quantity of inputs needed to produce the same quantity of output. Such advances include everything from scientific breakthroughs to better application of existing technology or simply reorganization of the flow of work.

Supply is also influenced by the **prices of related goods**, particularly goods that are alternative outputs of the production process. If the price of one production substitute rises, the supply of another substitute will decrease.

Government policy also has an important impact on the supply curve. Environmental and health considerations determine what technologies can be used, while taxes and minimum-wage laws can significantly affect input prices. Government trade policies have a major impact upon supply.

Finally, **special influences** affect the supply curve. The weather exerts an important influence on farming and on the ski industry. The computer industry has been marked by a keen spirit of innovation, which has led to a continuous flow of new products. Market structure will affect supply, and expectations about future prices often have an important impact upon supply decisions.

Table 3-4 highlights the important determinants of supply, using automobiles as an example.

Factors affecting the supply curve	Example for automobiles
1. Technology	Computerized manufacturing lowers production costs and increases supply.
2. Input prices	A reduction in the wage paid to autoworkers lowers production costs and increases supply.
3. Prices of related goods	If truck prices fall, the supply of cars rises.
4. Government policy	Removing quotas and tariffs on imported automobiles increases total automobile supply.
5. Special influences	Internet shopping and auctions allow consumers to compare the prices of different dealers more easily and drives high-cost sellers out of business.

TABLE 3-4. Supply Is Affected by Production Costs and Other Factors

Shifts in Supply

When changes in factors other than a good's own price affect the quantity supplied, we call these changes shifts in supply. Supply increases (or decreases) when the amount supplied increases (or decreases) at each market price.

When automobile prices change, producers change their production and quantity supplied, but the supply and the supply curve do not shift. By contrast, when other influences affecting supply change, supply changes and the supply curve shifts. We can illustrate a shift in supply for the automobile market. Supply would increase if the introduction of cost-saving computerized design and manufacturing reduced the labor required to produce cars, if autoworkers took a pay cut, or if the government repealed environmental regulations on the industry. Any of these elements would increase the supply of automobiles in the country.

Figure 3-6 illustrates an increase in the supply of automobiles.

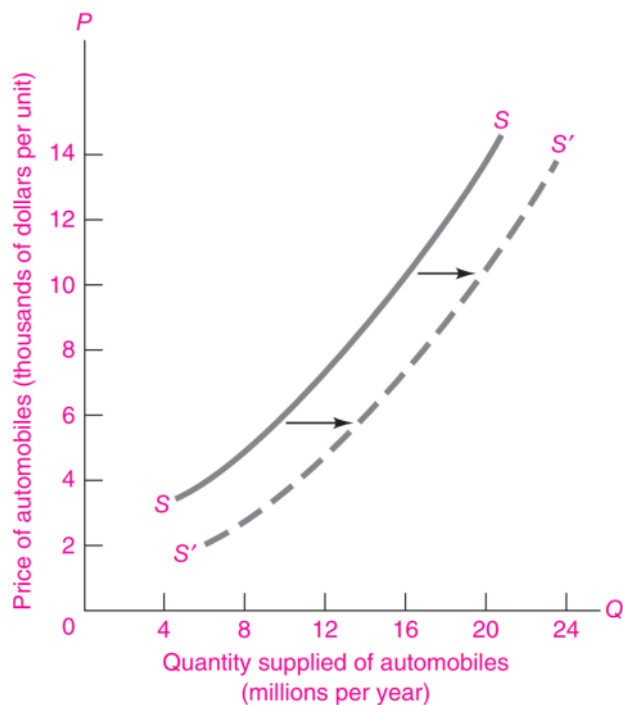


FIGURE 3-6. Increased Supply of Automobiles

As production costs fall, the supply of automobiles increases. At each price, producers will supply more automobiles, and the supply curve therefore shifts to the right.

To test your understanding of supply shifts, think about the following: What would happen to the world supply curve for oil if a revolution in Saudi Arabia led to declining oil production? What would happen to the supply curve for clothing if tariffs were slapped on Chinese imports into the United States? What happens to the supply curve for computers if Intel introduces a new computer chip that dramatically increases computing speeds?

EQUILIBRIUM OF SUPPLY AND DEMAND

Up to this point we have been considering demand and supply in isolation. But how can we put both sides of the market together?

The answer is that supply and demand interact to produce an equilibrium price and quantity, or a market equilibrium. The **market equilibrium** comes at that price and quantity where the forces of supply and demand are in balance. At the equilibrium price, the amount that buyers want to buy is just equal to the amount that sellers want to sell. The reason we call this an equilibrium is that, when the forces of supply and demand are in balance, there is no reason for price to rise or fall, as long as other things remain unchanged.

A **market equilibrium** comes at the price at which quantity demanded equals quantity supplied. At that equilibrium, there is no tendency for the price to rise or fall. The equilibrium price is also called the **market-clearing price**. This denotes that all supply and demand orders are filled, the books are "cleared" of orders, and demanders and suppliers are satisfied.

Combining Demand and Supply for Cornflakes					
	(1) Possible price (\$ per box)	(2) Quantity demanded (millions of boxes per year)	(3) Quantity supplied (millions of boxes per year)	(4) State of market	(5) Pressure on price
A	5	9	18	Surplus	↓ Downward
B	4	10	16	Surplus	↓ Downward
C	3	12	12	Equilibrium	Neutral
D	2	15	7	Shortage	↑ Upward
E	1	20	0	Shortage	↑ Upward

TABLE 3-5. Equilibrium Price Comes Where Quantity Demanded Equals Quantity Supplied

The table shows the quantities supplied and demanded at different prices. Only at the equilibrium price of \$3 per box does amount supplied equal amount demanded. At too low a price there is a shortage and price tends to rise. Too high a price produces a surplus, which will depress the price.

EQUILIBRIUM WITH SUPPLY AND DEMAND CURVES

We often show the market equilibrium through a supply-and-demand diagram which combines the supply curve with the demand curve. Combining the two graphs is possible because they are drawn with exactly the same variables and units on each axis.

We find the market equilibrium by looking for the price at which quantity demanded equals quantity supplied. **The equilibrium price comes at the intersection of the supply and demand curves**, at point C.

The equilibrium price and quantity come where the amount willingly supplied equals the amount willingly demanded. In a competitive market, this equilibrium is found at the intersection of the supply and demand curves. There are no shortages or surpluses at the equilibrium price.

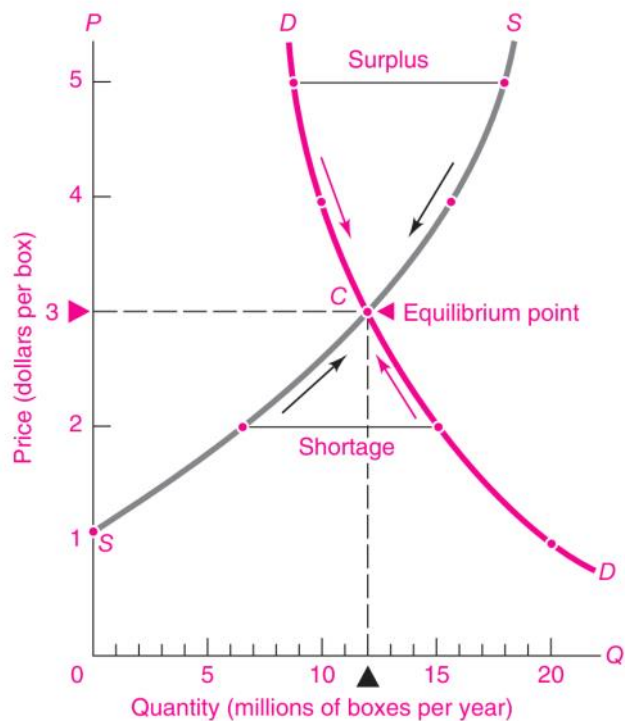


FIGURE 3-7. Market Equilibrium Comes at the Intersection of Supply and Demand Curves

The market equilibrium price and quantity come at the intersection of the supply and demand curves. At a price of \$3, at point C, firms willingly supply what consumers willingly demand. When the price is too low (say, at \$2), quantity demanded exceeds quantity supplied, shortages occur, and the price is driven up to equilibrium. What occurs at a price of \$4?

At point C, where the price is \$3 per box and the quantity is 12 units, the quantities demanded and supplied are equal: there are no shortages or surpluses; there is no tendency for price to rise or fall. At point C and only at point C, the forces of supply and demand are in balance and the price has settled at a sustainable level.

Effect of a Shift in Supply or Demand

The analysis of the supply-and-demand apparatus can do much more than tell us about the equilibrium price and quantity. It can also be used to predict the impact of changes in economic conditions on prices and quantities.

We can also use our supply-and-demand apparatus to examine how changes in demand affect the market equilibrium.

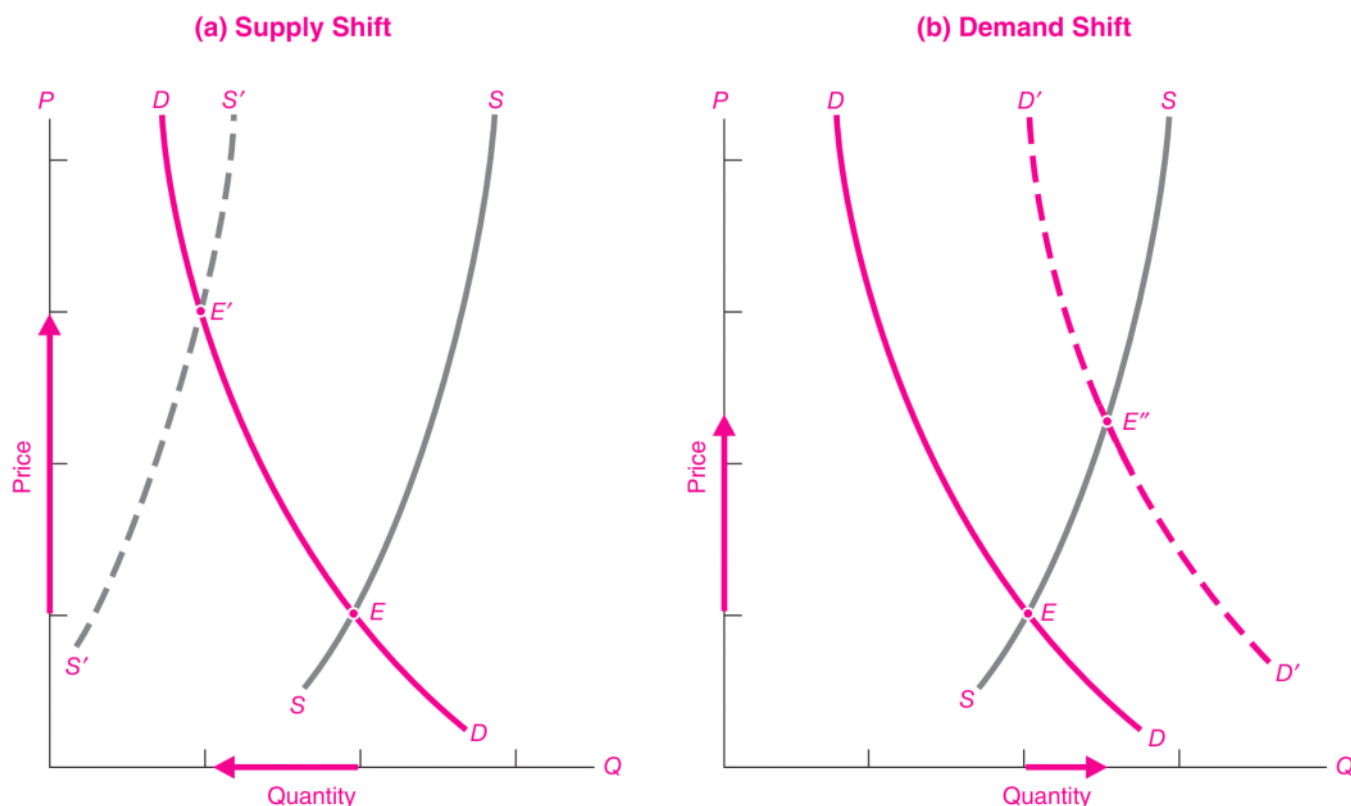


FIGURE 3-8. Shifts in Supply or Demand Change Equilibrium Price and Quantity

(a) If supply shifts leftward, a shortage will develop at the original price. Price will be bid up until quantities willingly bought and sold are equal, at new equilibrium E' . (b) A shift in the demand curve leads to excess demand. Price will be bid up as equilibrium price and quantity move upward to E'' .

For both examples of shifts—a shift in supply and a shift in demand—a variable underlying the demand or supply curve has changed. In the case of supply, there might have been a change in technology or input prices. For the demand shift, one of the influences affecting consumer demand—incomes, population, the prices of related goods, or tastes—changed and thereby shifted the demand schedule (see Table 3-6).

	Demand and supply shifts	Effect on price and quantity
If demand rises . . .	The demand curve shifts to the right, and . . .	Price \uparrow Quantity \uparrow
If demand falls . . .	The demand curve shifts to the left, and . . .	Price \downarrow Quantity \downarrow
If supply rises . . .	The supply curve shifts to the right, and . . .	Price \downarrow Quantity \uparrow
If supply falls . . .	The supply curve shifts to the left, and . . .	Price \uparrow Quantity \downarrow

TABLE 3-6. The Effect on Price and Quantity of Different Demand and Supply Shifts

When the elements underlying demand or supply change, this leads to shifts in demand or supply and to changes in the market equilibrium of price and quantity.

The Elusive Concept of Equilibrium

The notion of equilibrium is one of the most elusive concepts of economics. We are familiar with equilibrium in our everyday lives from seeing, for example, an orange sitting at the bottom of a bowl or a pendulum at rest. In economics, equilibrium means that the different forces operating on a

market are in balance, so the resulting price and quantity reconcile the desires of purchasers and suppliers. Too low a price means that the forces are not in balance, that the forces attracting demand are greater than the forces attracting supply, so there is excess demand, or a shortage. We also know that a competitive market is a mechanism for producing equilibrium. If the price is too low, demanders will bid up the price to the equilibrium level.

If we fail to understand the nature of economic equilibrium, we cannot hope to understand how different forces affect the marketplace.

In economics, we are interested in knowing the quantity of sales that will clear the market, that is, the equilibrium quantity. We also want to know the price at which consumers willingly buy what producers willingly sell. Only at this price will both buyers and sellers be satisfied with their decisions. Only at this price and quantity will there be no tendency for price and quantity to change.

Only by looking at the equilibrium of supply and demand can we hope to understand such paradoxes as the fact that immigration may not lower wages in the affected cities, that land taxes do not raise rents, and that bad harvests raise (yes, raise!) the incomes of farmers.

RATIONING BY PRICES

By determining the equilibrium prices and quantities, the market allocates or rations out the scarce goods of the society among the possible uses. **Who does the rationing? The marketplace**, through the interaction of supply and demand, does the rationing. This is **rationing by the purse**.

What goods are produced? This is answered by the signals of market prices. High corn prices stimulate corn production, whereas falling computer prices stimulate a growing demand for computation. Those who have the most dollar votes have the greatest influence on what goods are produced.

For whom are goods produced? The power of the purse dictates the distribution of income and consumption. Those with higher incomes end up with larger houses, fancier cars, and longer vacations. When backed up by cash, the most urgently felt needs get fulfilled through the demand curve.

Even **the how question is decided by supply and demand**. When corn prices are high, farmers buy expensive tractors and more fertilizer and invest in irrigation systems. When oil prices are high, oil companies drill in deep offshore waters and employ novel seismic techniques to find oil.

With this introduction to supply and demand, we begin to see how desires for goods, as expressed through demands, interact with costs of goods, as reflected in supplies. Further study will deepen our understanding of these concepts and will show how these tools can be applied to other important areas.

SUMMARY

1. The analysis of supply and demand shows how a market mechanism solves the three problems of *what*, *how*, and *for whom*. A market blends together demands and supplies. Demand comes from consumers who are spreading their dollar votes among available goods and services, while businesses supply the goods and services with the goal of maximizing their profits.

A. The Demand Schedule

2. A demand schedule shows the relationship between the quantity demanded and the price of a commodity, other things held constant. Such a demand schedule, depicted graphically by a demand curve, holds constant other things like family incomes, tastes, and the prices of other goods. Almost all commodities obey *the law of downward-sloping demand*, which holds that quantity demanded falls as a good's price rises. This law is represented by a downward-sloping demand curve.

3. Many influences lie behind the demand schedule for the market as a whole: average family incomes, population, the prices of related goods, tastes, and special influences. When these influences change, the demand curve will shift.

B. The Supply Schedule

4. The supply schedule (or supply curve) gives the relationship between the quantity of a good that producers desire to sell—other things constant—and that good's price. Quantity supplied generally responds positively to price, so the supply curve is upward-sloping.

5. Elements other than the good's price affect its supply. The most important influence is the commodity's production cost, determined by the state of technology and by input prices. Other elements in supply include the prices of related goods, government policies, and special influences.

C. Equilibrium of Supply and Demand

6. The equilibrium of supply and demand in a competitive market occurs when the forces of supply and demand are in balance. The equilibrium price is the price at which the quantity demanded just equals the quantity supplied. Graphically, we find the equilibrium at the intersection of the supply

and demand curves. At a price above the equilibrium, producers want to supply more than consumers want to buy, which results in a surplus of goods and exerts downward pressure on price. Similarly, too low a price generates a shortage, and buyers will therefore tend to bid price upward to the equilibrium.

7. Shifts in the supply and demand curves change the equilibrium price and quantity. An increase in demand, which shifts the demand curve to the right, will increase both equilibrium price and quantity. An increase in supply, which shifts the supply curve to the right, will decrease price and increase quantity demanded.

8. To use supply-and-demand analysis correctly, we must (a) distinguish a change in demand or supply (which produces a shift of a curve) from a change in the quantity demanded or supplied (which represents a movement along a curve); (b) hold other things constant, which requires distinguishing the impact of a change in a commodity's price from the impact of changes in other influences; and (c) look always for the supply-and-demand equilibrium, which comes at the point where forces acting on price and quantity are in balance.

9. Competitively determined prices ration the limited supply of goods among those who demand them.