UNIT 2: DETERMINATION OF PRICES

LEARNING OUTCOMES

At the end of this unit, you should be able to:

- Explain how the prices are generally determined.
- Describe how changes in demand and supply affect prices and quantities demanded and supplied.

2.0 INTRODUCTION

Prices of goods express their exchange value. Prices are also used for expressing the value of various services rendered by different factors of production such as land, labour, capital and organization in the form of rent, wages, interest and profit respectively. Therefore, the concept of price, especially the process of price determination, is of vital importance in Economics.

In this unit, we shall learn how demand and supply interact to strike a balance so that equilibrium price is determined in a free market. A free market is one in which the forces of demand and supply are free to take their own course and there is no intervention from outside by government or any other entity. It is to be noted that, generally, it is the interaction between demand and supply that determines the price, but sometimes Government intervenes and determines the price either fully or partially. For example, the Government of India fixes the price of petrol, diesel, kerosene, coal, fertilizers, etc. which are critical inputs. It also fixes the procurement prices of wheat, rice, sugarcane, etc. in order to protect the interests of both producers and consumers. While determining these prices, the Government takes into account factors like cost of inputs, risks of business, nature of the product etc.

One of the main reasons for studying the demand and supply model is that the model is particularly useful in explaining how markets work. A comprehensive knowledge of the movements of these market forces enables us to explain the observed changes in equilibrium prices and quantities of all types of products and factors. We will be able to anticipate the possible market outcomes in real markets by applying the principles underlying the interactions of demand and supply. Business firms can use the model of demand and supply to predict the probable effects of various economic as well as non-economic factors on equilibrium prices and quantities. For example, the market outcomes of government intervention in the form of taxation, subsidies, price ceiling and floor prices etc. can be analysed with the help of equilibrium analysis.

2.1 DETERMINATION OF PRICES - A GENERAL VIEW

In an open competitive market, it is the interaction between demand and supply that tends to determine equilibrium price and quantity. In the context of market analysis, the term equilibrium refers to a state of market in which the quantity demanded of a commodity equals the quantity supplied of the commodity. In an equilibrium state, the aggregate quantity that all firms wish to sell equals the total quantity that all buyers in the market wish to buy and therefore, the market clears. Equilibrium price or market clearing price is the price at

which the quantity demanded of a commodity equals the quantity supplied of the commodity i.e. at this price there is no unsold stock or no unsupplied demand.

To analyse how equilibrium price is determined in a market, we need to bring together demand for and supply of the commodity in the market, for this we have the following schedule:

Table – 3: Determination of Price

| S. No.	Price (₹)	Demand Units	Supply (Units)
1	1	60	5
2	2	35	35
3	3	20	45
4	4	15	55
5	5	10	65

When we plot the above points on a single graph with price on Y-axis and quantity demanded and supplied on X-axis, we get a figure as shown below:
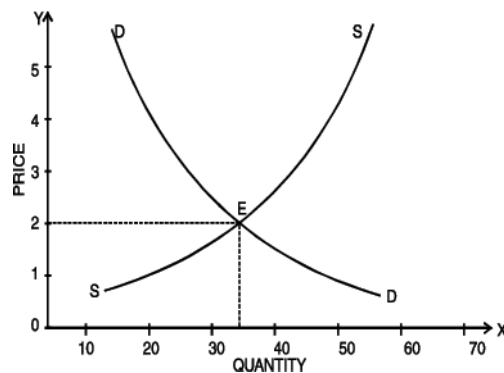
Fig. 6: Determination of Equilibrium Price

It is easy to see what will be the market price of the article. It cannot be ₹ 1, because at that price there would be 60 units in demand, but only 5 units on offer. Competition among buyers would force the price up. On the other hand, it cannot ₹ 5, for at that price, there would be 65 units on offer for sale but only 10 units in demand. Competition among sellers would force the price down. At ₹ 2, demand and supply are equal (35 units) and the market price will tend to settle at this figure. This is equilibrium price and quantity – the point at which price and output will tend to stay. Once this point is reached, we will have stable equilibrium. Equilibrium is said to be stable if any disturbance to it is self-adjusting so that the original equilibrium is restored. In other words, if the equilibrium be disrupted, the market returns to equilibrium. It should be noted that it would be stable only if other things are equal.

Figure 7 will demonstrate how stable equilibrium is achieved through price mechanism or market mechanism. If the market price is above the equilibrium price, say ₹ 15, the market supply is greater than market demand and there is an excess supply or surplus in the market. Competing sellers will lower prices in order to clear their unsold stock. As we know, *other things remaining constant,* as price falls quantity demanded rises and quantity supplied falls. In this process the supply-demand gap is reduced and eventually eliminated thus restoring equilibrium.
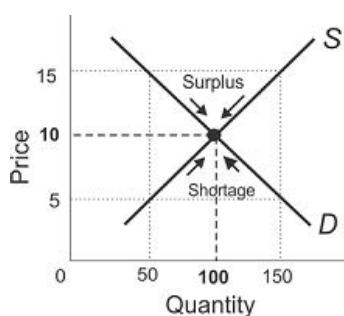
Fig 7: Stable Equilibrium

Likewise, if the prevailing market price is below equilibrium, say ₹ 5 in our example, a shortage arises as quantity demanded exceeds the quantity supplied. The shortage prompts the price to rise, as the buyers, who are unable to obtain as much of the good as they desire, bid the price higher. The market price tends to increase. Other things remaining the same, the price rise causes a decrease in the quantity demanded by the buyers and an increase in the quantity supplied by the sellers and vice versa. This process will continue as long as demand exceeds supply. The market thus achieves a state where the quantity that firms sell is equal to the quantity that the consumers desire to buy. At equilibrium price (₹ 10), the supply decisions of the firms tend to match the demand decisions of the buyers. Thus, the equilibrium is restored automatically, through the fundamental working of the market and price movements eliminate shortage or surplus.

2.2 CHANGES IN DEMAND AND SUPPLY

The above analysis of market equilibrium was done by us under the ceteris paribus assumption. The facts of the real world, however, are such that the determinants of demand other than price of the commodity under consideration (like income, tastes and preferences, population, technology, prices of factors of production etc.) always change causing shifts in demand and supply. Such shifts affect equilibrium price and quantity. The four possible changes in demand and supply are:

(i)   An increase (shift to the right) in demand;

(ii)   A decrease (shift to the left) in demand;

(iii)   An increase (shift to the right) in supply;

(iv)   A decrease (shift to the left) in supply.

We will consider each of the above changes one by one.

(i)   *An increase in demand:* In figure 8, the original demand curve of a normal good is DD and supply curve is SS. At equilibrium price OP, demand and supply are equal to OQ.

Now suppose the money income of the consumer increases and the demand curve shifts to D_1D_1 and the supply curve remains the same. We will see that on the new demand curve D_1D_1 at OP price, demand increases to OQ_2 while supply remains the same i.e. OQ and there is excess demand in the market equal to Q Q_2. Since supply is short of demand, price will go up to OP_1. With the higher price, supply will also shoot up generating an increase in the quantity supplied or an upward movement along the supply curve. Ultimately, a new equilibrium between demand and supply will be reached. At this equilibrium point, OP_1 is the price and OQ_1 is the quantity which is demanded and supplied.
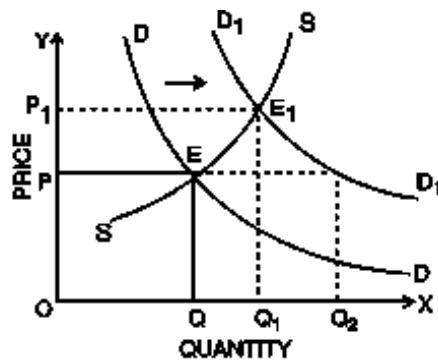
Fig. 8: Increase in Demand, causing an increase in equilibrium price and quantity

Thus, we see that, with an increase in demand, there is an increase in equilibrium price, as a result of which the quantity supplied rises. As such, the quantity sold and purchased also increases.

(ii) Decrease in Demand: The opposite will happen when demand falls as a result of a fall in income, while the supply remains the same. The demand curve will shift to the left and become D_1D_1 while the supply curve remains as it is. With the new demand curve D_1D_1, at original price OP, OQ_2 is demanded and OQ is supplied.

As the supply exceeds demand, price will come down and quantity demanded will go up. A new equilibrium price OP_1 will be settled in the market where demand OQ_1 will be equal to supply OQ_1.
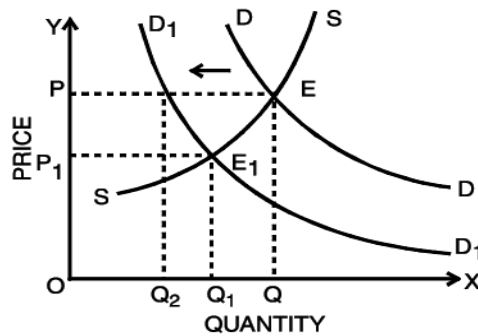
Fig. 9: Decrease in Demand Resulting in a Decrease in Price and Quantity Demanded

Thus, with a decrease in demand, there is a decrease in the equilibrium price and quantity demanded and supplied.

(iii) Increase in Supply: Let us now assume that demand does not change, but there is an increase in supply say, because of improved technology.
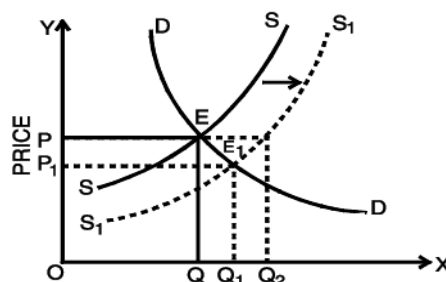

Fig. 10: Increase in Supply, Resulting In Decrease in Equilibrium Price and Increase in Quantity Supplied

The supply curve SS will shift to the right and become S_1S_1. At the original equilibrium price OP, OQ is demanded and OQ_2 is supplied (with new supply curve). At the original price, a surplus now exists; as a result, the equilibrium price falls and the quantity demanded rises. A new equilibrium price OP_1 will be settled in the market where demand OQ_1 will be equal to supply OQ_1. Thus, as a result of an increase in supply with demand remaining the same, the equilibrium price will go down and the quantity demanded will go up.

(iv) *Decrease in Supply:* Let us now assume that due to obsolete technology, there is decrease in supply. In the figure 11, the supply curve SS will shift to the left and become S_1S_1. At the original equilibrium price OP, OQ is quantity demanded and OQ_2 is quantity supplied (with new supply curve). At the original price, a deficit now exists; as a result equilibrium price rises and the quantity demanded decreases. A new equilibrium price OP1 will be settled in the market where demand OQ_1 will be equal to supply OQ_1.

Thus as a result of decrease in supply we will find that equilibrium price will go up, but the amount sold and purchased will go down as shown in figure 11.
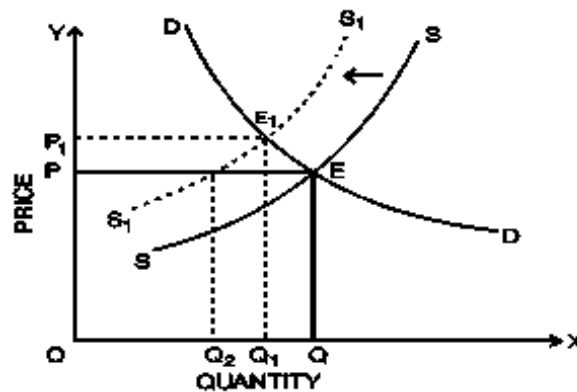

Fig.11: Decrease in Supply Causing an Increase in the Equilibrium Price and a fall in Quantity Demanded

2.3 SIMULTANEOUS CHANGES IN DEMAND AND SUPPLY

Till now, we were considering the effect of a change either in demand or in supply on the equilibrium price and quantity sold and purchased. It sometimes happens that events shift both the demand and supply curves at the same time. This is not unusual; in real life, supply curves and demand curves for many goods and services typically shift quite often because of continuous change in economic environment. During a war, for example, shortage of goods will often lead to decrease in their supply while full employment causes high total wage payments which increase demand.

What happens when the demand and supply curves shift in the same direction? We may discuss the effect on equilibrium price and quantity when both demand and supply increase simultaneously with the help of the diagrams in the next page:
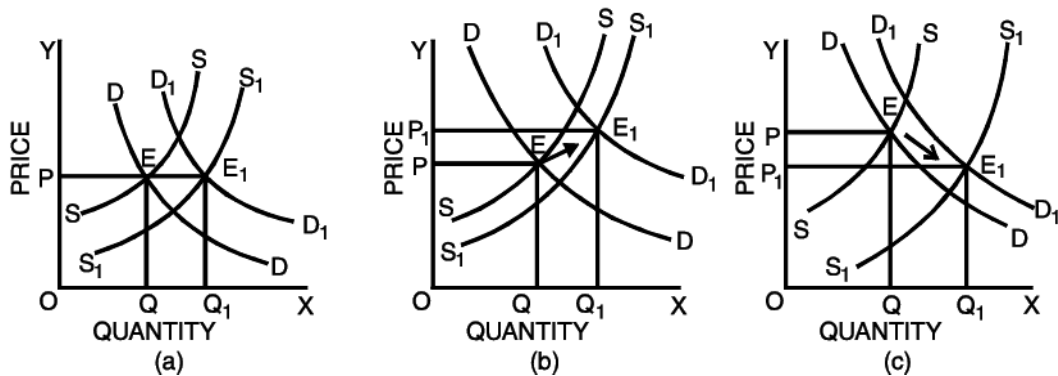
Fig.12: Simultaneous Change in Demand and Supply

Fig. 12 shows simultaneous change in demand and supply and its effects on the equilibrium price. In the figure, the original demand curve DD and the supply curve SS meet at E at which OP is the equilibrium price and OQ is the quantity bought and sold.

Fig. 12(a) shows that increase in demand is equal to increase in supply. The new demand curve D_1D_1 and S_1S_4 meet at E_1. The new equilibrium price is equal to the old equilibrium price (OP). However, equilibrium quantity is more.

Fig. 12(b) shows that increase in demand is more than increase in supply. Hence, the new equilibrium price OP_1 is higher than the old equilibrium price OP. The opposite will happen i.e. the equilibrium price will go down if there is a simultaneous fall in demand and supply and the fall in demand is more than the fall in supply.

Fig. 12(c) shows that supply increases in a greater proportion than demand. The new equilibrium price will be less than the original equilibrium price. Conversely, if the fall in the supply is more than proportionate to the fall in the demand, the equilibrium price will go up.

What is the effect on equilibrium price and quantity when both demand and supply decrease? You can check it yourselves with the help of diagrams.

We can summarise the two possible outcomes when the supply and demand curves shift in the same direction as follows:

◆ When both demand and supply increase, the equilibrium quantity increases but the change in equilibrium price is uncertain.

◆ When both demand and supply decrease, the equilibrium quantity decreases but the change in equilibrium price is uncertain.

What happens when the demand and supply curves shift in opposite direction? We may discuss the effect on equilibrium price and quantity when demand and supply curves shift in opposite direction with the help of the diagrams given in the next page:

(a)   (b)
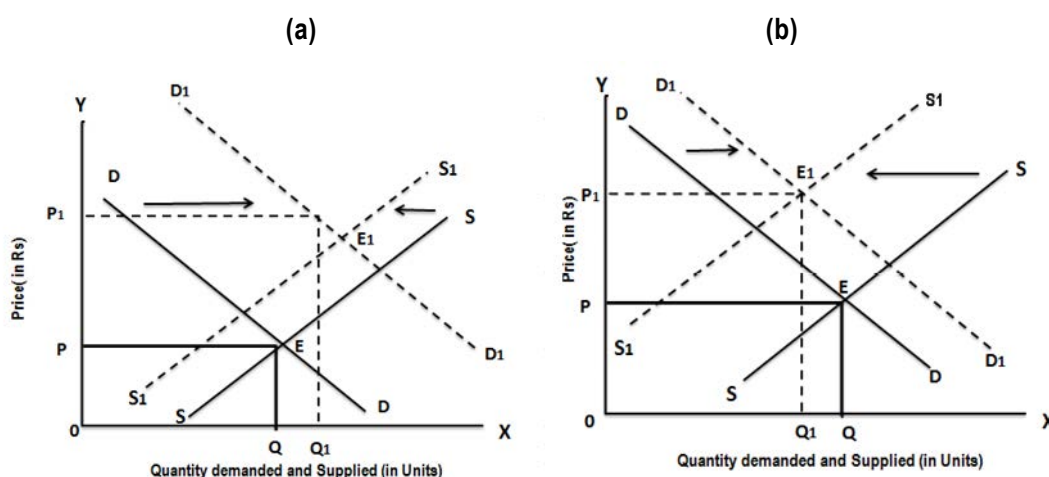
**Fig 13: Effect on Equilibrium Price and Quantity When
Demand and Supply Curves Shift in Opposite Directions**

In panel (a) there is a simultaneous rightward shift of the demand curve and leftward shift of the supply curve. Here, the increase in demand is more than the decrease in supply, therefore, the equilibrium price and equilibrium quantity will rise. In panel (b) there is also a coincident rightward shift of the demand curve and leftward shift of the supply curve. Here, the decrease in supply is more than the increase in demand, consequently, the equilibrium price rises and the equilibrium quantity falls. In both cases, the equilibrium price rises from P to P_1 as the equilibrium moves from E to E_1. What is the effect on quantity? In panel (a), the increase in demand is large relative to the decrease in supply and the equilibrium quantity rises as a result. In panel (b), the decrease in supply is large relative to the increase in demand, and the equilibrium quantity falls as a result. That is, when demand increases and supply decreases, the actual quantity bought and sold can go either way, depending on how much the demand and supply curves have shifted.

In general, when supply and demand shift in opposite directions, we cannot predict what the ultimate effect will be on the quantity bought and sold. What we can say is that a curve that shifts a disproportionately greater distance than the other curve will have a disproportionately greater effect on the quantity bought and sold.

We can summarise the two possible outcomes when the supply and demand curves shift in the opposite directions as follows:

♦   When demand increases and supply decreases, the equilibrium price rises but nothing certain can be said about the change in equilibrium quantity.

♦   When demand decreases and supply increases, the equilibrium price falls but nothing certain can be said about the change in equilibrium quantity.

ILLUSTRATION 1

D_1 and S_1 are the original demand and supply curves. D_2, D_3, S_2 and S_3 are possible new demand and supply curves. Starting from initial equilibrium point (1), what point on the graph is most likely to result from each change given in Questions 1 to 4?

Quantity demanded and supplied (in units)
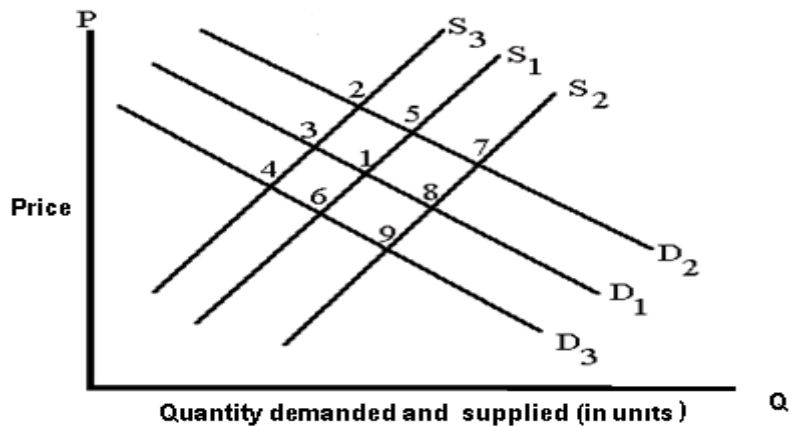
SOLUTION

1. Assume X is a normal good. Holding everything else constant, assume that income rises and the price of a factor of production also increases. What point in the figure above is most likely to be the new equilibrium price and quantity?

2. We are analyzing the market for good Z. The price of a complement good, good Y, declines. At the same time, there is technological advance in the production of good Z. What point the figure above is most likely to be the new equilibrium price and quantity?

3. Heavy rains in Maharashtra during 2005 and 2006 caused havoc with the rice crop. What point in the figure above is most likely to be the new equilibrium price and quantity?

4. Assume that consumers expect the prices of new cars to significantly increase next year. What point in the figure above is most likely to be the new equilibrium price and quantity?

Let us try answering these questions.

1: When income of people rises, the demand curve will shift to right (becomes D2) as X is given to be a normal good. An increase in the price of factors of production used in the production of the good under consideration will decrease its supply and shift the supply curve to the left to S3. The new demand and supply of X will meet at Point 2.

2: When the price of a complementary good falls, the demand for the good in question increases. Therefore, when price of the complementary good Y falls, the demand curve for Z will move to right and become D2 and due to technological advancement the supply of Z will increase and become S2. The new demand and supply of Z will meet at Point 7.

3: Due to heavy rains, the supply of rice will fall and the new equilibrium point will be 3. It is assumed that there is no change in demand.

4: If prices of cars are expected to increase in future, the demand curve will shift to right. Assuming that the supply remains constant, the new equilibrium point will be 5.

SUMMARY

◆ Prices of goods express their exchange value.

◆ In an open competitive market, it is the interaction between demand and supply that tends to determine equilibrium price and quantity.

◆ Equilibrium price or market clearing price is the price at which the quantity demanded of a commodity equals the quantity supplied of the commodity there is no unsold stock or no unsupplied demand.

◆ Equilibrium is said to be stable if any disturbance to it is self-adjusting so that the original equilibrium is restored automatically, through the fundamental working of the market. Price movements eliminate shortage or surplus.

◆ If demand increases without any corresponding increase in supply, there will be increase in equilibrium price, as a result of which the quantity sold and purchased also increases.

◆ If demand decreases without any change in supply, there will be decrease in the equilibrium price and quantity demanded and supplied.

◆ If there is an increase in supply without any change in demand, the equilibrium price will go down and the quantity demanded will go up.

◆ If there is a decrease in supply without any change in demand, the equilibrium price will go up but the amount sold and purchased will go down.

◆ There can be simultaneous changes in both demand and supply and the equilibrium price will change according to the proportionate change in demand and supply.

◆ When both demand and supply increase, the equilibrium quantity increases but the change in equilibrium price is uncertain.

◆ When both demand and supply decrease, the equilibrium quantity decreases but the change in equilibrium price is uncertain.

◆ When demand increases and supply decreases, the equilibrium price rises but nothing certain can be said about the change in equilibrium quantity.

◆ When demand decreases and supply increases, the equilibrium price falls but nothing certain can be said about the change in equilibrium quantity.