Law of Supply: Schedule, Curve, Function, Assumptions and Exception

Law of supply expresses a relationship between the supply and price of a product. It states a direct relationship between the price of a product and its supply, while other factors are kept constant.

For example, in case the price of a product increases, sellers would prefer to increase the production of the product to earn high profits, which would automatically lead to increase in supply.

Similarly, if the price of the product decreases, the supplier would decrease the supply of the product in market as he/she would wait for rise in the price of the product in future.

The statement given for the law of supply is as follows:

"Other things remaining unchanged, the supply of a commodity expands with a rise in its price and contracts with a fall in its price."

The law of supply can be better understood with the help of supply schedule, supply curve, and supply function. Let us discuss these concepts in detail in the next sections.

Supply Schedule:

Supply schedule shows a tabular representation of law of supply. It presents the different quantities of a product that a seller is willing to sell at different price levels of that product.

A supply schedule can be of two types, which are as follows:

i. Individual Supply Schedule:

Refers to a supply schedule that represents the different quantities of a product supplied by an individual seller at different prices.

Table-8 shows the supply schedule for the different quantities of milk supplied in the market at different prices:

Table-8: Individual Supply Schedule	
Price of Milk (per liter in ₹)	**Quantity Supplied(1000 per day in liters)**
10	10
12	13
14	20
16	25

ii. Market Supply Schedule:

Refers to a supply schedule that represents the different quantities of a product that all the suppliers in the market are willing to supply at different prices. Market supply schedule can

be drawn by aggregating the individual supply schedules of all individual suppliers in the market.

Table-9 shows the market supply schedule of a product supplied by three suppliers. A, B, and C:

Price of Product X (per unit in ₹)	Individual Supply (per day)			Market Supply (per day)
	A	B	C	
100	750	500	450	1700
200	800	650	500	1950
300	900	750	650	2300
400	1000	900	700	2600

Table-9: Market Supply Schedule

Supply Curve:

The graphical representation of supply schedule is called supply curve. In a graph, price of a product is represented on Y-axis and quantity supplied is represented on X-axis. Supply curve can be of two types, individual supply curve and market supply curve. Individual supply curve is the graphical representation of individual supply schedule, whereas market supply curve is the representation of market supply schedule.

Figure-14 shows the individual supply curve for the individual supply schedule (represented in Table-8):

Figure-14: Individual Supply Curve

In Figure-14, the supply curve is showing a straight line and an upward slope. This implies that the supply of a product increases with increase in the price of a product.

Figure-15 shows the market supply curve of market supply schedule (represented in Table-9):
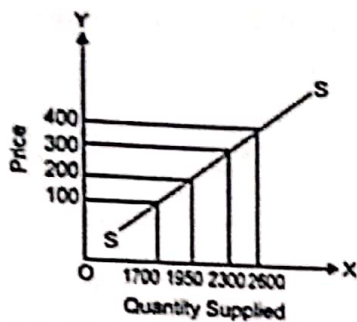
Figure-15: Market Demand Curve

The slope of market supply curve can be obtained by calculating the supply of the slopes of individual supply curves. Market supply curve also represents the direct relationship between the quantity supplied and price of a product.

Supply Function:

Supply function is the mathematical expression of law of supply. In other words, supply function quantifies the relationship between quantity supplied and price of a product, while keeping the other factors at constant. The law of supply expresses the nature of relationship between quantity supplied and price of a product, while the supply function measures that relationship.

The supply function can be expressed as:

$Sx = f(Px)$

Where:

Sx = Quantity supplied for product X

Px = Price of product X

f = Constant representing change produced in Sx with one unit change in Px

Assumptions in Law of Supply:

The law of supply expresses the change in supply with relation to change in price. In other words the main assumption of law of supply is that it studies the effect of price on supply of a product, while keeping other determinants of supply at constant.

Apart from this, there are certain assumptions that are necessary for the application of law of supply, which are as follows:

i. Assumes that the price of a product changes, but the change in the cost of production is constant. This is because if the cost of production rises with increase in price, then sellers would not supply more due to the reduction in their profit margin. Therefore, law of supply would be applicable only when the cost of production remains constant.

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ii. Assumes that there is no change in the technique of production. This is because the advanced technique would reduce the cost of production and make the seller supply more at a lower price.

iii. Assumes that there is no change in the scale of production. This is because if the scale of production changes with a period of time, then it would affect the supply. In such a case, the law of supply would not be applicable.

iv. Assumes that the policies of the government remain constant. If there is an increase in tax rates, then the supply of product would decrease even at the higher price. Therefore, for the application of law of supply, it is necessary that government policies should remain constant.

v. Assumes that the transportation cost remain the same. In case the transportation cost reduces, then the supply would increase, which is invalid according to the law of supply.

vi. Assumes that there is no speculation about prices in future, which otherwise can affect the supply of a product. If there is no speculation about products, then the economy is assumed to be at balance and people are satisfied with the available products and do not require any change.

Exception to Law of Supply:

According to the law of supply, if the price of a product rises, then the supply of the product also rises and vice versa. However, there are certain conditions where the law of supply is not applicable. These conditions are known as exceptions to law of supply. In such cases, the supply of a product falls with the increase in price of a product at a particular point of time.

For example, there would be decrease in the supply of labor in an organization when the rate of wages is high. The exception of law of supply is represented on the regressive supply cure or backward sloping curve. It is also known as exceptional supply curve, which is shown in Figure-16:
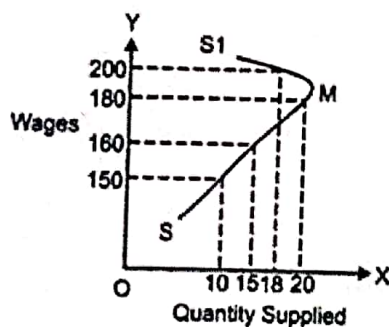

Figure-16: Exceptional Supply Curve

In Figure-16, SMS1 is the exceptional supply curve for labor. In this case, wages are regarded as the price of labor. It can be interpreted from the graph that as the wages of a worker increases, its quantity supplied that is working hours decreases, which is an exception to the law of supply.

Some of the exceptions of law of supply are as follows:

i. Speculation:

Refers to the fact that the supply of a product decreases instead of increasing in present when there is an expected increase in the price of the product. In such a case, sellers would not supply the whole quantity of the product and would wait for the increase in price in future to earn high profits. This case is an exception to law of demand.

ii. Agricultural Products:

Imply that law of supply is not valid in case of agricultural products as the supply of these products depends on particular seasons or climatic conditions. Thus, the supply of these products cannot be increased after a certain limit in spite of rise in their prices.

iii. Changes in Other Situations:

Refers to the fact that law of supply ignores other factors (except price) that can influence the supply of a product. These factors can be natural factors, transportation conditions, and government policies.

Supply Curve and Shifts of the Supply Curve

Let us learn about the movement along the supply curve and shifts of the supply curve.

The supply curve of a commodity normally shows the relation between the quantities supplied of a commodity and its market price, assuming that all other factors influencing supply remain constant. On the basis of this assumption, we consider movements along the same supply curve from left to the right (or from right to the left).

But, in practice, we observe that other factors do not remain constant over time. If there is a change in another variable the whole supply curve will shift to a new position. So economists find it necessary to draw a distinction between a movement along the supply curve and a shift of the entire curve.

A movement along the same curve implies that a larger (smaller) quantity of a commodity is being supplied at a lower (higher) price. Such movements imply that different quantities are being offered for sale at different prices, ceteris paribus.

Thus, if all the determinants of supply, except the own price of the commodity, remain constant then we have a change in quantity supplied. This is also called movement along the same supply curve caused by a change in the product's own price.

Symbolically,

$$S_x = f(P_x, P_a \ldots P_c, P_L \ldots P_o, T.C_r, S_t, O.G)$$

The bar signs over the heads of all the variables except P_x indicates that those variables are constant.

A movement along a supply curve occurs when a change in own price of a commodity causes a change in the quantity supplied. This may be explained in terms of Fig. 4.16. At the price OP, let PA be the supply of a commodity. If price rises, quantity supplied will increase to M and, if price falls, quantity supplied will decrease to D, along the supply curve SS. Thus, the term quantity supplied refers to a point on the supply curve.
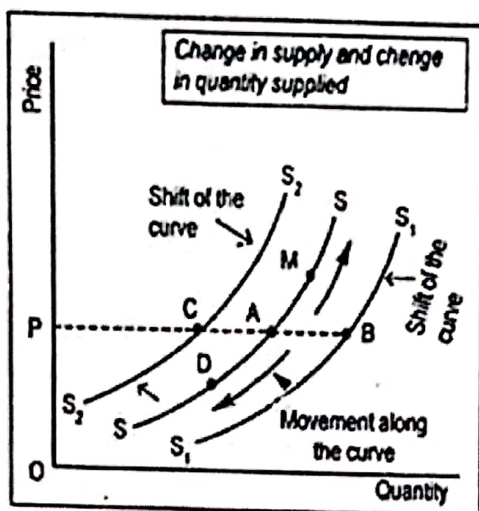
Fig. 4.16: Shifts of the Supply Curve

On the other hand, there occurs a shift in supply when any of the determinants of supply, except the own price, changes. This means that the supply curve shifts bodily due to a change in something other than the product price. Symbolically,

$$S_x = f(P_x, P_a \ldots P_c, P_L \ldots P_0, T, C_r, S_t, O, G)$$

Here P_x is fixed.

A shift of the supply curve implies that a different quantity is being offered for sale at a particular given price, as Fig. 4.16 shows. As the supply curve shifts from SS to $S_1 S_1$ the quantity offered for sale at price OP goes up from PA to PB. Such shifts occur due to changes in one or more of the ceteris paribus assumptions and are known as changes in the conditions of supply.

If one of the determinants of supply— except own price—change, supply curve may shift backward or forward. At a price OP, quantity supplied is PA.

Now if taxes are imposed on the article, supply curve will shift from SS to $S_2 S_2$, thereby reducing supply from PA to PC, even price of the good in question is kept at OP. On the other hand, assume that the price of raw materials declines. This causes SS curve to shift to the rightward direction to $S_1 S_1$ and the supplier now supplies PB—a larger quantity than PA.

Table 4.5 summarizes the main causes of such shifts and indicates their direction.

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Table 4.5: The Terminology of Supply curves

Change	Terms used to describe the change
(A) A change in the price of a good causes a MOVEMENT ALONG a supply curve	
1. Price of the good rises	1. An increase or rise in the quantity supplied
2. Price of the good falls	2. A decrease, fall or reduction in the quantity supplied
(B) A change in any of the other influences causes a SHIFT of a supply curve	
1. A rise in the price of a substitute product	1. A rightward, downward or south-easternly shift of the supply curve
2. A fall in the price of a factor of production	2. An increase in supply
3. An improvement in the state of technology (a rise in productivity)	3. An improvement in the condition of supply

Market Equilibrium & Demand and Supply Equilibrium

(Market equilibrium refers to the stage where the quantity demanded for a product is equal to the quantity supplied for the product.)

The price when the quantity demanded is equal to the quantity supplied for the product is known as equilibrium price.

Equilibrium price is also termed as market clearing price, which is referred to a price when there is neither an unsold stock nor an unsupplied demand.

The market price refers to a current price at which a product is sold in the market. It is determined by the collaboration of two functions, namely, demand and supply. According to economic theory, the market price of a product is determined at a point where the forces of supply and demand meet. The point where the forces of demand and supply meet is called equilibrium point. Conceptually, equilibrium means state of rest. It is the stage where the balance between two opposite functions, demand and supply is achieved.

Let us understand the concept of market equilibrium with the help of an example.

Table-10 shows the market demand and supply for talcum powder in Mumbai with their varying prices of a week:

Table-10: Demand and Supply Schedule for Talcum Powder				
Prices (in ₹)	Demand (In thousands)	Supply (In thousands)	Market Position	Effect on Price
100	80,000	10,000	Shortage	Rise
200	55,000	28,000	Shortage	Rise
300	40,000	40,000	Equilibrium	Stable
400	28,000	50,000	Surplus	Fall
500	20,000	55,000	Surplus	Fall
600	15,000	60,000	Surplus	Fall

Determination of Market Price:

The equilibrium price of a product is determined when the forces of demand and supply meet. For understanding the determination of market equilibrium price, let us take the example of talcum Powder shown in Table-10. In Table-10 we have taken the initial price of talcum powder as Rs. 100.

In this case, the quantity demanded is 80,000, while the supply is 10,000. This results in the shortage of 70,000 of talcum powder in the market. Due to this shortage, the sellers get a chance to earn more by increasing the price of the talcum powder and consumers are ready to purchase at the price quoted by sellers due to shortage of talcum powder.

This increase in profit results in increase in the production of a product to earn more profit, which, in turn, increases the supply of the product. The process of increase in prices goes on

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till the price of talcum powder reaches to Rs. 300. At this price, the demand and supply is equal to 40,000. Therefore, equilibrium is achieved and the equilibrium price is Rs. 300.

Similarly, if the supply of talcum powder increases beyond Rs. 300, then the sellers need to decrease their prices to sell their unsold stock. They would also stop production that results in the decrease in supply. In such a case, consumers would buy more due to reduction in price of talcum powder. This would continue till the stock would achieve equilibrium and the equilibrium price come out to be Rs. 300.

The graphical representation of equilibrium of demand and supply is shown in Figure-20:
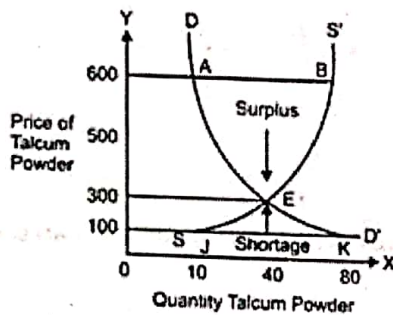

Figure-20: Equilibrium of Demand and Supply

Shifts in Market Equilibrium:

If there is a shift in supply or demand curve, then the equilibrium point also gets shifted.

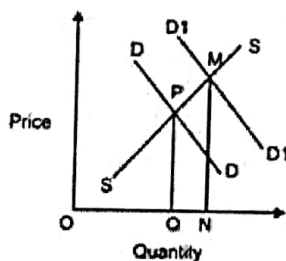The shift in demand curve and equilibrium is shown in Figure-21:

Figure-21: Shift in Demand and Equilibrium

In Figure-21, initially the equilibrium price is found at PQ and quantity at OQ. However, when the demand curve shifted from DD to D1D1, then equilibrium also shifts from PQ to MN. Now, the equilibrium price is at MN and the quantity is at ON. In this case, the supply does not show any changes. It can also be interpreted from Figure-21 that the equilibrium price has increased with an increase in quantity, when demand curve shifts.

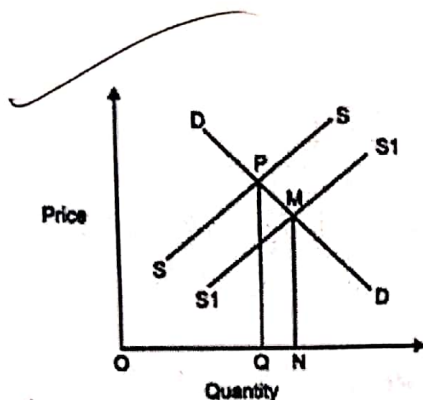The shift in supply curve and equilibrium is shown in Figure-22:

Figure-22: Shift in Supply Curve and Equilibrium

In Figure-22, initially the equilibrium price is found at PQ and quantity at OQ. However, when the supply curve shifted from SS to S1S1, then equilibrium also shifts from PQ to MN. Now, the equilibrium price is at MN and the quantity is at ON. In this case, the demand does not show any changes. It can also be interpreted from Figure-22 that the equilibrium price has decreased and quantity has increased, when supply curve shifts.

Now, let us determine the effect of simultaneous shifts in the demand and supply curve on the equilibrium point. It basically depends on the extent of shift in the demand and supply curves. In case the shift in supply curve is greater than the demand curve, then equilibrium price decreases and output increases.

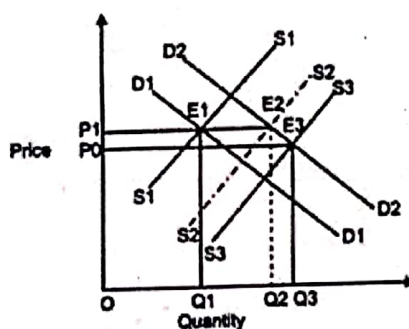**It can be better explained with the help of Figure-23:**

Figure-23: Equilibrium Position (when shift in supply is more than demand)

In Figure-23, initially equilibrium position. E1 is obtained by balancing demand curve, D1D1 and supply curve, S1S1. Equilibrium price at E1 is P1 and quantity is OQ1. When the demand curve shifts from D1D1 to D2D2 and supply curve shifts from S1S1 to S3S3, then equilibrium also shifts from E1 to E3.

In this case, supply shift is greater than the shift in demand; therefore, equilibrium price falls down to PO and output increases to OQ3. However, if the shift in demand and supply curve is equal that is D2D2 and S2S2 respectively, then the equilibrium price remain constant and output increases to Q2.

In case, shift in demand curve is greater than the shift in supply curve, then the both, equilibrium price and quantity, increase, as shown in Figure-24:
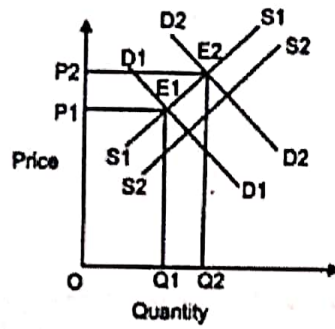
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Figure-24: Equilibrium Position (when shift in demand is more than supply)

In Figure-24, initially equilibrium position, E1 is obtained by balancing the demand curve, D1D1 and supply curve, S1S1. Equilibrium price at E1 is P1 and quantity is OQ1. When the demand curve shifts from D1D1 to D2D2 and supply curve shifts from S1S1 to S2S2, then equilibrium also shifts from E1 to E2. In this case, demand shift is greater than the shift in supply; therefore, equilibrium price increases to P2 and output increases to OQ2.