

The Fundamentals of Supply

6.1 INTRODUCTION

Supply refers to the various amounts of a good which the sellers are willing and able to sell at any given price per unit of time. The unit of time may be chosen according to the circumstances of each particular problem. It may be a day, a week, a month, a season, or a year. It is to be assumed that the general circumstances of the market remain unchanged throughout this period; that there is, for instance, no change in fashion or taste, no possibility of new substitute for the product or new invention to disturb the supply.

6.2 FACTORS INFLUENCING SUPPLY (DETERMINANTS OF SUPPLY)

The quantity supplied of any commodity, say X, depends on several factors:

1. **Price of that commodity itself** i.e. at higher price more of it is offered for sale.

2. **Price of other commodities:** The relative profitability of different commodities affects the relative attractiveness to firms for different lines of production. New firms or established firms seeking new product to produce will tend to undertake production of those commodities which provide higher possibilities of profits e.g. in agriculture, if price

of wheat rises and price of cotton remains the same then the producer, other things being equal, will think of producing more of wheat

3. Goals of the Producers: It is quite likely that all the producers are not governed merely by the aim of profit maximization. Some producers may think of selling the maximum output and acquiring wider market; or others may prefer to function in the interest of the society and sell the products, being content so long as the cost is covered. Thus, the goals of producers differ. However, in the elementary theory of production and supply we assume that the single important goal of the firm is to maximize its profits.

4. State of Technology: The improvement in the technique of production essentially leads to increase in supply. Inventions and innovations make it possible to produce more or better commodities and thus tend to increase the quantity supplied of same product and to reduce the quantity supplied of products that are displaced.

5. Cost of Production: Changes in the price or factors of production affect the Cost of Production. When the cost of production increases the producer will decide to produce less; and vice versa, other things being equal.

6. Availability of Raw Materials and other Inputs: Supply will depend on the quantity of the commodity produced, which in turn will depend on the availability of inputs. In the absence of required amounts of raw materials and inputs, production, and thereby supply will be adversely affected.

7. Climate and Forces of Nature: The supply of a commodity is also influenced by the forces of nature. This is mainly in case of Agriculture. Agriculture in India continues to be a 'gamble in the monsoon' and hence the supply of foodgrains depends on the moods of the monsoon.

8. Time Element: The supply of any commodity is also determined by the period of time under consideration. There is the possibility that at a certain point of time supply cannot be enhanced. It remains fixed, irrespective of the price offered for the commodity in the market. But if sufficiently long period of time is allowed, some adjustments are possible in the quantity supplied.

9. Transport Facilities: The availability of transport plays an important part in influencing the size of the

market; and the extent of the market will call for adjustments in supply of the products.

10. Taxation and Subsidy: The taxation policy of the Government will also influence the 'production-initiative' of the entrepreneurs as also the prices of the products and will thus influence the quantity of the commodities supplied. Even the amount of subsidy provided to the producers will influence the supply of goods.

11. Expectations Regarding Future Prices: This may lead to either speculative hoarding or even distress sales.

6.3 THE SUPPLY FUNCTION

The Supply Function for commodity X can be written as:

$$Q_{SX} = f (P_X, p, c, G, T \dots \text{Etc})$$

Even here, as in the case of demand, we assume that everything that affects the quantity supplied, other than its price, is held constant and thus the supply function in its most simplest form can be written as follows:

$$Q^S_X = f (P_X) \quad P^I = P^I_0$$

$$c = c_0$$

$$G = G_0$$

$$T = T_0$$

6.4 THE LAW OF SUPPLY

The Law of Supply establishes the functional relationship between price of a commodity & its quantity supplied assuming factors other than the price of the commodity remaining constant.

The Law of Supply states: "**Other things remaining the same, quantity supplied of commodity X is directly related to its price.**" i.e. when the price of X rises the quantity supplied of X expands & when the price of X falls, the quantity supplied of X contracts. What are the 'other things that must remain the same'?

1. The prices of other goods must remain the same.
2. The cost of production must remain unchanged.

3. The methods of production must remain the same.
4. There should be no change in the availability of inputs or factors of production.
5. There should be no change in transport facilities.
6. The weather conditions should remain the same.

7. There should be no change in the tax structure or in the amount of subsidies.

8. Goals of the producer must remain unchanged.

9. The seller should not expect further changes in prices.

In short, all the factors, other than the price of that commodity, influencing the supply of that commodity must remain the same for the law of supply to hold good.

The Supply Schedule

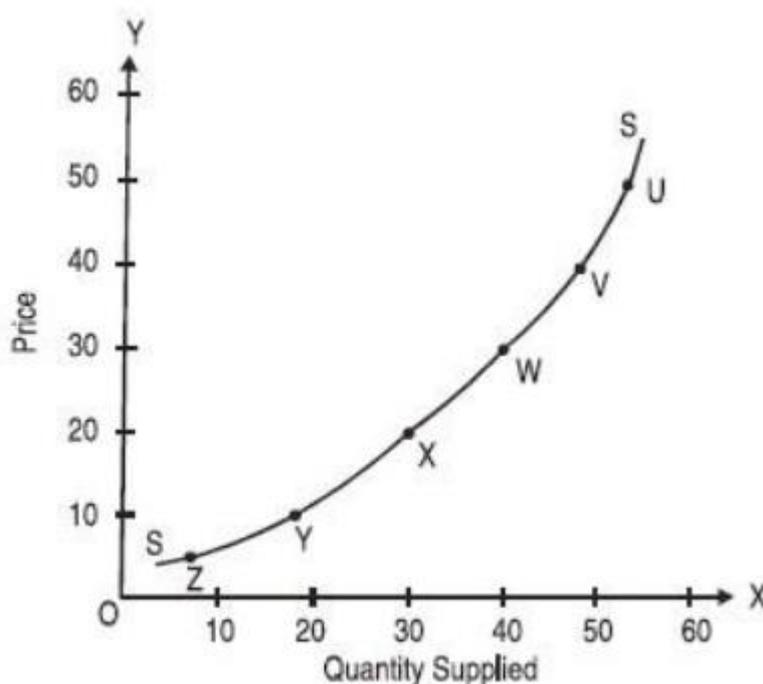
The Supply Schedule refers to a tabular presentation of the various amounts of commodity supplied at different possible prices at

A Supply Schedule		
	Price of commodity X per unit	Quantity supplied of commodity X per unit
U	50	53
V	40	48
W	30	40
X	20	30
Y	10	18
Z	5	7

The supply schedule shows the direct relationship between price & quantity supplied, i.e. at a higher price the seller is prepared to sell more of commodity X, and at a lower price he is inclined to sell less.

The Supply Curve

On the basis of the supply schedule, when we plot points on a graph we get the Supply Curve. The supply curve refers to a graphical presentation of the relation between price & quantity supplied. It is customary to represent price on the Y- axis & the quantity on the X- axis.



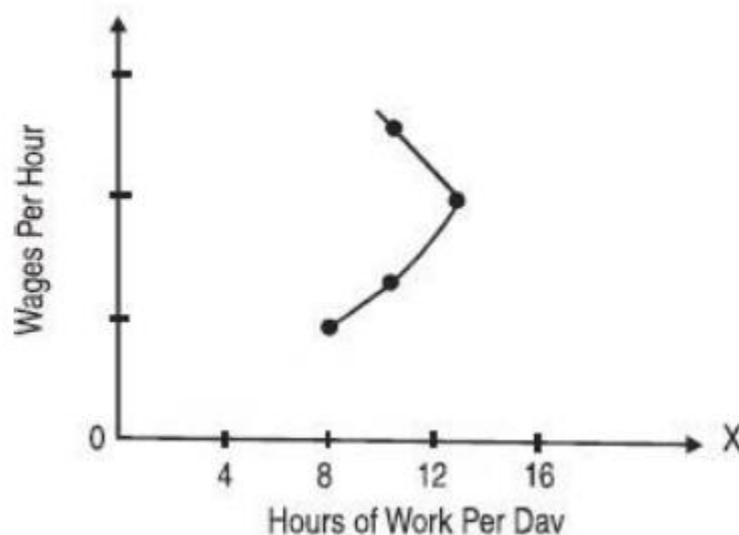
6.5 BACKWARD BENDING SUPPLY CURVE OF LABOUR; AN EXCEPTION TO THE LAW OF SUPPLY

The Supply Curve shows the complete functional relationship between price and the quantity supplied.

The supply curve slopes upwards from left to right, indicating a **positive relationship** between price & quantity supplied & hence the supply curve has a positive slope.

An interesting exception to the law of Supply is provided by the **Supply curve of labour**: In case of

supply of labour we come across the unusual phenomenon of the **Backward Bending Supply Curve**. An example would make the point clear. To begin with, the supply curve of labour slopes upward as usual because as the wage rate per hour goes on increasing the supply of labour (number of hours of work) goes on increasing, i.e. the workers do show greater willingness to work as the wage rate begins to rise. This continues till the time the wage rates have risen sufficiently e.g. In the



when wage rate is Rs 5/- per hour the worker puts in 8 hours of work per day & gets in all Rs 40/- per day i.e. 1,200 per month. If he is given Rs 7/- per hour he may increase the supply of his labour and show preparedness to work for even 10 hours a day & enjoy Rs 70/- per day i.e. 2,100 per month. It is also likely that given Rs 10/- per hour he may be prepared to work even 12 hours a day (between 7.00 a.m to

7.00 p.m or 8.00 a.m to 8.00 p.m) and enjoy Rs 120 per day; i.e. Rs 3600 per month. But now the maximum limit is reached; if the wage rate is now raised to Rs 12 per hour; the worker will reduce his supply of labour to 10 hours per day because that too will give him Rs 120 per day and Rs 3600 per month; besides he will now have more of leisure. Thus, if the wage rate goes beyond a particular level the worker prefers to substitute work by leisure and cuts short the supply of labour.

Hence, beyond a certain level of wage rate, the supply curve of labour slopes backward. This is called the **backward bending supply curve of labour and is an exception to the Law of supply.**

6.6 RESERVATION PRICE AND SUPPLY

The Reservation Price of a seller is that price below which the seller would not sell the commodity.

The Reservation Price of a seller depends on:

i) **The need for liquid cash.** If the seller is in urge need of liquid cash, his reservation price will be low because he will desperately be in need of converting his goods into ready money.

ii) The **durability of the commodity**. If the commodity is highly perishable, the reservation price is low and therefore he disposes of the stock of the perishable goods.

iii) The **expectations** of the price of his commodity likely to prevail in the market in future. If he expects that prices are likely to rise in the future, his reservation price is substantially higher than the current price of the commodity in the market and therefore, he will not release his stocks for sale. But if he anticipates prices to decline in the future, his reservation price will be low and he will prefer to dispose of his stock at the existing market price.

iv) The **cost of storage** of the commodity. If the cost of storage is high, his reservation price may be duly affected and he would like to dispose of the stock at the earliest possible opportunity. In the absence of storage facility the reservation price will be low.

6.7 VARIATIONS AND CHANGES IN SUPPLY (Movements along the Curve V/S Shifts of Curves)

As we distinguished between the concepts of 'extension and increase' in demand and '**contraction and decrease**' in demand so also we can differentiate between '**extension**' and '**increase**' in supply and '**contraction**' and '**decrease**' in supply. To understand the distinctions let us first clarify the meaning of extension and contraction and then

consider the concept of increase and decrease in supply.

Like demand behaviour, the supply behaviour too is influenced by the determinants of supply. The most significant among the determinants being the '**price**' factor, it causes the variation in supply in the form of extension and contraction of supply. On the other hand, the **factors other than the price lead to the change in supply**, in the form of increase and decrease in supply.

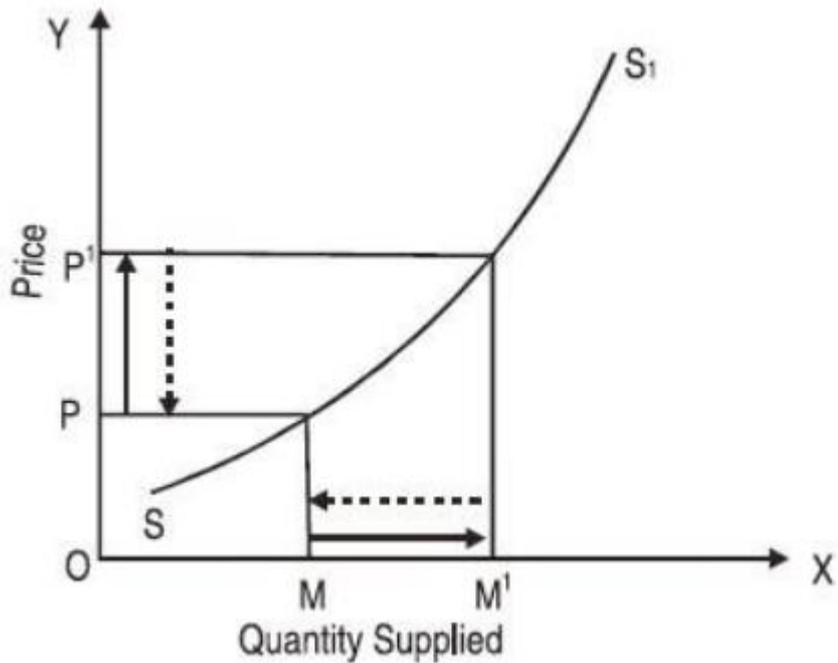
A. Variations in Supply (Extension and Contraction of Supply)

If change in the price of X is the only factor influencing the quantity supplied of X then we have either extension or contraction in supply. If

the price rises from OP to OP_1 the supply expands from OM to OM_1 . This is

called extension of supply and if the price falls from OP_1 to OP , the quantity supplied will contract from OM_1 to OM .

This is called contraction of supply. **Both extension and contraction of supply are shown by movement along the same supply curve.**



B. Changes in Supply (Increase and Decrease in Supply)

When factors other than price of a commodity influence the supply of that commodity, then we have either Increase in Supply of that commodity or Decrease in its Supply, shown by shifts in the Supply Curve.

THE SUPPLY IS SAID TO HAVE INCREASED IF:

- i) At the same price, more is supplied (arrow 1)

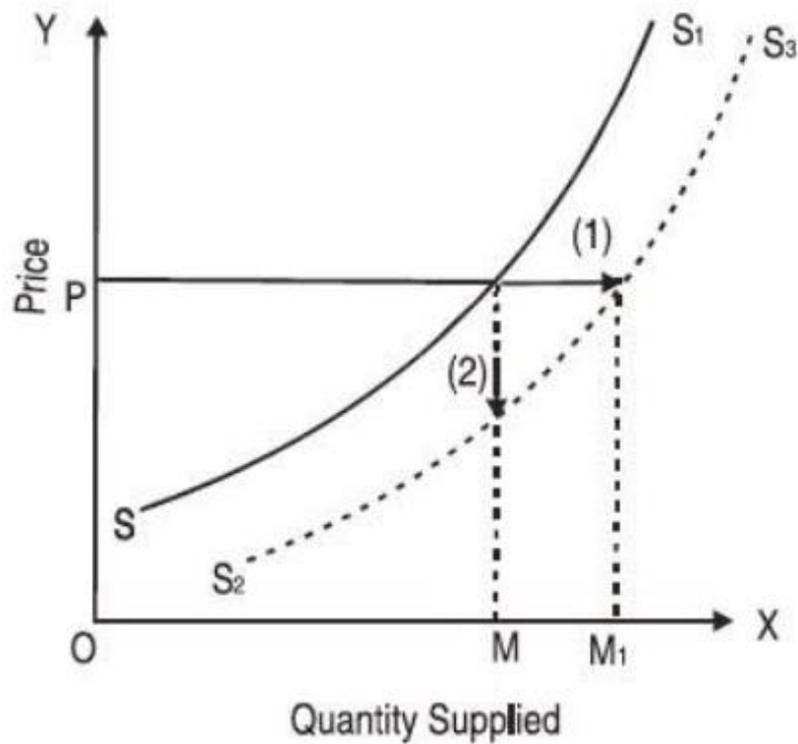


Fig 6.4 Increase in Supply

ii) At a lower price, the same quantity is supplied (arrow 2) When supply increases the supply curve shifts to the right. e.g the new supply curve is now S_2S_3

THE SUPPLY IS SAID TO HAVE DECREASED IF:

i) At the same price less is supplied; (Arrow 3)

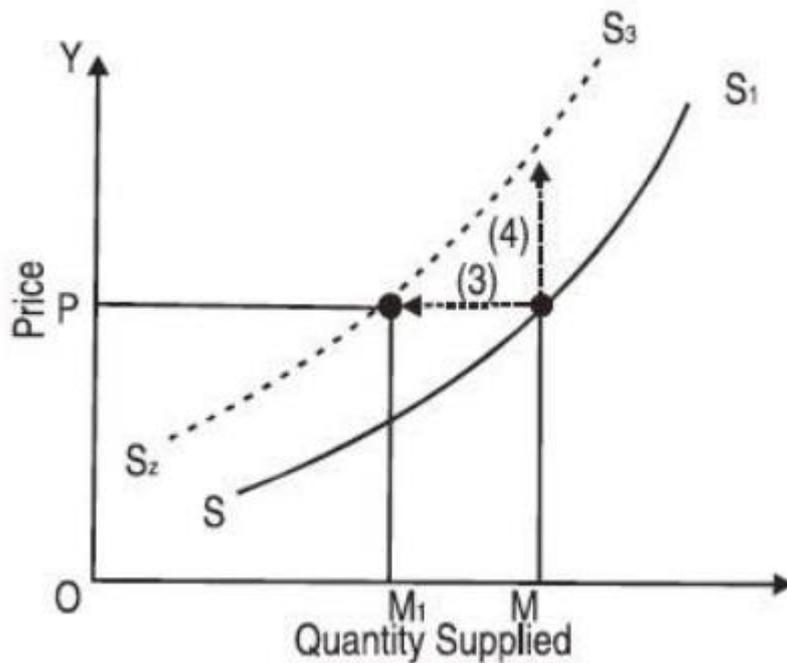


Fig 6.5 Decrease in Supply

At higher price, the same quantity is supplied (Arrow 4)

When supply decreases, the supply curve shifts to the left. e.g. from SS_1 to S_2S_3 .

6.8 ELASTICITY OF SUPPLY

The change in price of a commodity may bring about either exactly proportionate or less than proportionate or more than proportionate change in the quantity supplied of that commodity. It is this degree of responsiveness of quantity supplied to the change in price which is called elasticity of supply. Thus, **Elasticity of Supply may be defined as the degree of responsiveness of quantity supplied of X to change in price of X.**

$$E_s = \frac{\% \text{ change in Quantity Supplied of X}}{\% \text{ change in price of x}}$$

$$\frac{\frac{\text{New Quantity supplied} - \text{Old Quantity supplied}}{\text{Old quantity supplied}} \times 100}{\frac{\text{New price} - \text{Old price}}{\text{Old price}} \times 100}$$

$$= \frac{\frac{\Delta S}{S}}{\frac{\Delta P}{P}}$$

$$\therefore E_s = \frac{P}{S} \frac{\Delta S}{\Delta P}$$

Five Types of Elasticities of Supply:

1. **Unit Elastic Supply:** When change in price of X brings about exactly proportionate change in its quantity supplied then supply is unit elastic i.e. elasticity of supply is equal to one, e.g. if price rises by 10% and supply expands by 10% then,

$$E_s = \frac{\% \text{ change in Quality Supplied of x}}{\% \text{ change in price of x}} = 1$$

2. **Relatively Inelastic Supply:** When change in price brings about less than proportionate change in the quantity supplied the supply is relatively inelastic or elasticity of supply is less than one.

3. **Relatively Elastic Supply:** When change in price brings about more than proportionate change in the

quantity supplied, then supply is relatively elastic or elasticity of supply is greater than one.

4. **Perfectly Inelastic Supply:** When a change in price has no effect on the quantity supplied then supply is perfectly inelastic or the elasticity of supply is zero.

5. **Perfectly Elastic Supply:** When a negligible change in price brings about an infinite change in the quantity supplied, then supply is said to be perfectly elastic or elasticity of supply is infinity.

All the five types of Elasticities of supply can be shown by different slopes of the supply curve.

Fig. 6.6 (a) shows the supply is unit elastic because change in price from OP to OP_1 brings about exactly proportionate change in the quantity supplied of commodity X

viz., from OM to OM_1 . In this case $E_s = 1$.

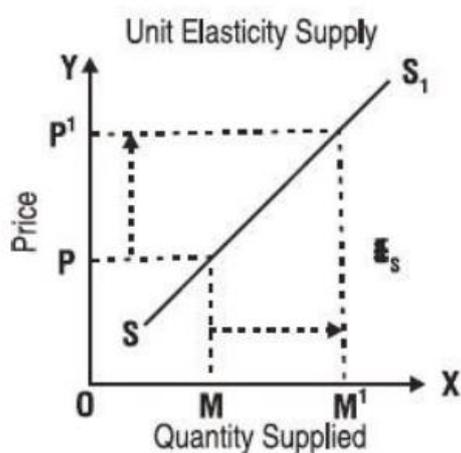


Fig 6.6 (a)

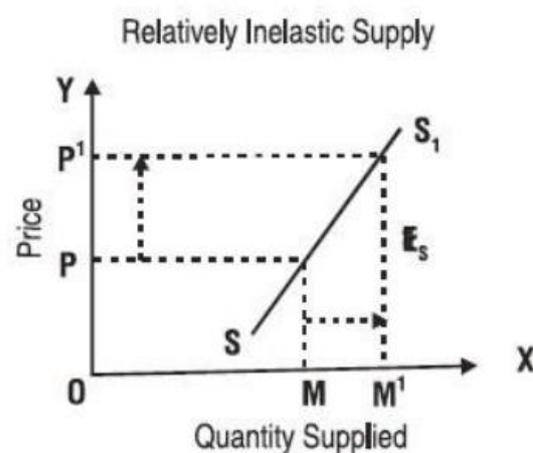


Fig 6.6 (b)

Fig 6.6(b) shows that supply is relatively inelastic because change in price of from OP to OP_1 brings

about less than proportionate change in quantity supplied of X. in this case $E_s < 1$.

Fig 6.6(c) shows that supply is relatively elastic because change in price of X from OP to OP_1 brings about more than proportionate change in quantity supplied of X. in this case $E_s > 1$.

Fig 6.6(d) shows that supply is perfectly inelastic because change in price of X from OP to OP_1 has absolutely no effect on quantity supplied of X. in this case $E_s = 0$. Thus, if the supply curve is vertical, i.e. parallel to Y-axis it represents perfectly inelastic supply.

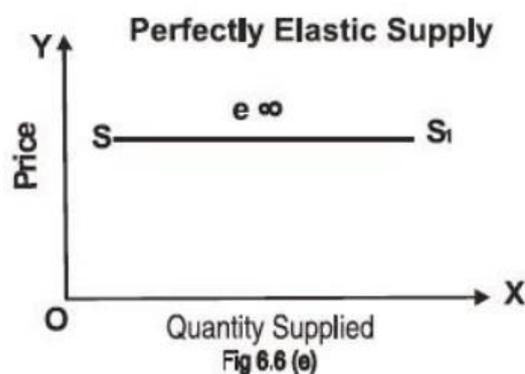
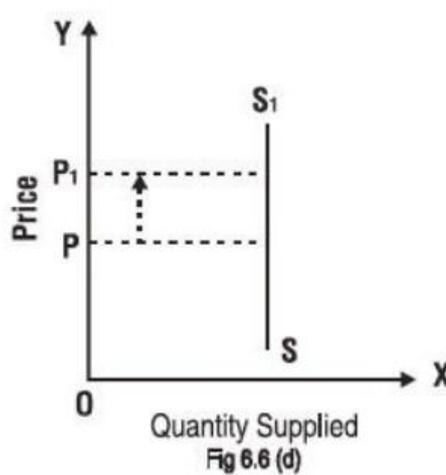
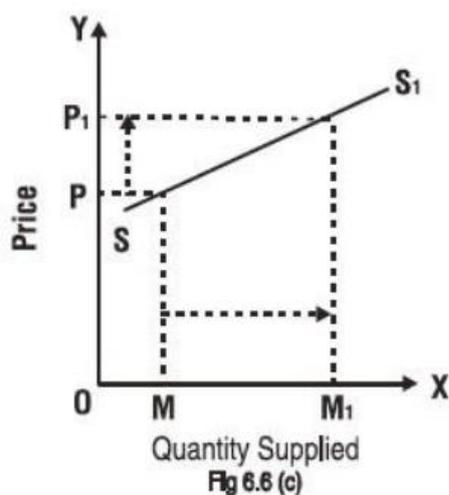


Fig 6.6(e) shows that supply is perfectly elastic because a small change in price of X brings about infinite change in supply. Thus, if the supply curve is

horizontal or parallel to Xaxis it represents perfectly elastic supply.

Hence, the five different types of elasticities of supply can be shown by five different slopes of supply curve.

6.9 TIME ELEMENT AND SUPPLY

Marshall assigned considerable importance to the element of time in the determination of supply. More often than not, demand responds readily to a change in price but supply takes some time to adjust itself to the change in price; so much so that demand today is the function of price today, i.e. $q = f(p_t)$; of course, assuming other things remaining constant, but supply today may be the function of the price prevailing in the immediate past.

Now **depending upon the period of time supply can adjust itself either partly or fully or not at all to the change in demand and price**; and will in turn influence the price. Hence **Marshall has classified time period into four categories** on the basis of the degree of responsiveness of the supply to adjust itself to changing market conditions.

i) **The Very Short Period or the Market Period** is that period of time in which the supply is fixed or is perfectly inelastic. The very short period is so short a period that supply cannot adjust itself to change in demand, e.g. if the demand for fish, or milk, or any such commodity shoots up one fine morning, it would be difficult to increase their supply immediately to meet the demand.

ii) **The Short Period** is that period in which the supply can adjust itself only partly to the change in demand; may be as a result of firms making use of their plant capacity by varying the amounts of only

variable factors. The short period is not long enough to enable the firms to expand their plant capacities.

iii) **The Long Period** refers to that period of time in which the supply can adjust itself more fully or even fully to the change in demand. The supply becomes more elastic and at times even perfectly elastic. The long period is long enough to permit the firms to expand their plant capacities and also enables new firms to enter the field of production.

iv) **Very Long Period** is that period of time for which it is difficult to predict as to what will happen to the forces of demand and supply. Tastes and

preferences change. Technology undergoes drastic change. In fact Keynes expressed his opinion, 'In the very long period we are dead'.

Thus, depending upon the period of time allowed to pass, the supply can adjust itself either partly, fully or not at all to change in demand and will thus influence price in the market. Time element thus plays an important role in the theory of price through its influence on supply.