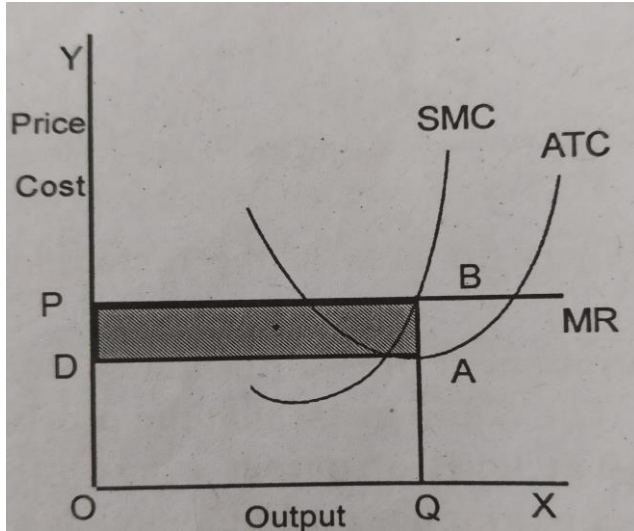


### Super Normal Profits versus Losse:

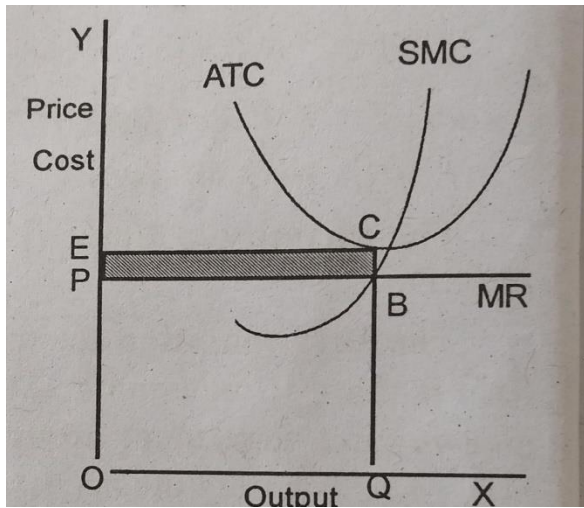
In the short run a firm under perfect competition can make super normal profits or incur loss. The firm makes super normal profits or losses depends on the level of the average total cost (ATC) at the short run equilibrium.

If the ATC is below the price at equilibrium the firm makes super normal profits.



The equilibrium level of output is OQ and price is equal to OP. Profit per unit is the difference between price and AC, which is equal to AB. Total profit is equal to AB multiplied by the level output OQ. This is shown by the rectangle PBAD.

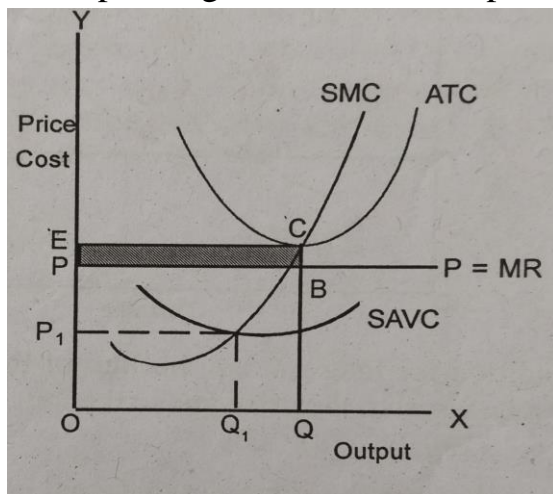
If the ATC is above the price, the firm makes a loss. The higher level of ATC could be attributed to higher fixed costs.



ATC is higher than price, on each unit of output sold, the firm makes a loss, which is equal to CB. Total loss made by the firm is equal to the rectangle PBCE.

### Shut Down Point (Closing Down Point):

The optimum level of output is produced by a firm when price or MR MC and MC is rising. However if price were smaller than the average total cost, the firm would incur a loss. This is shown in the following figure. If price continues to fall and reaches P, the price is equal to the minimum average variable cost and output is equal to  $Q_1$ . At this level of output the firm will only be able to cover its variable costs and none of the fixed costs. If the price falls below AVC, the firm should shut down its operations so that it can avoid paying the variable cost. The price corresponding to the shut down point ( $P = SAVC$ ) is called the shut down price.



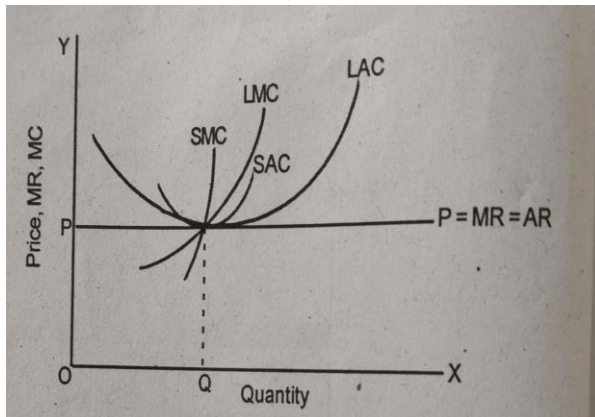
### LONG RUN EQUILIBRIUM OF THE FIRM

In the long run firms are in equilibrium when they have adjusted their plant so as to produce at the minimum point of their long run average cost curve. At the equilibrium point the LAC is tangent to the demand curve. The firms earn only normal profits in the long run. If they earn supernormal profits, new firms will enter the industry. If the firms make losses, in the long run some firms will exit the industry.

If the market price were above P, the firm would make supernormal profits. New firms will enter the industry in anticipation of higher profits.

If the market price were below P, firms would sustain losses. Some of the existing firms would leave the industry which would cause a reduction in the market supply, which forces the price to rise to the level of P. When the market price is P, the profit maximizing output is Q. The firm earns only normal profits.

At price P, existing firms have no desire to expand their operation and new firms have no incentive to enter the industry.



The condition for long run equilibrium of the firm is that the marginal cost be equal to the price and to the long run average cost.

$$\mathbf{LMC = LAC = P}$$

At the equilibrium the short run marginal cost is equal to the long run marginal cost and the short run average cost is equal to the long run average cost. Thus the equilibrium condition can be stated as,

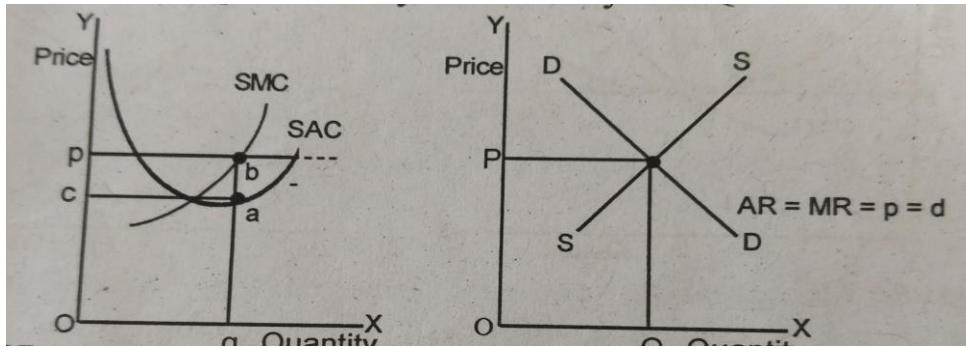
$$\mathbf{SMC = LMC = SAC = LAC = P = MR = AR}$$

When this condition is attained, the firm is operating at the minimum point of both the short run and long run average cost curves. The firm is in equilibrium because there is no tendency to change. Other firms will not be attracted to the industry.

### **SHORT RUN EQUILIBRIUM OF THE INDUSTRY**

A firm is in equilibrium in the short run when it maximizes its net revenue. If all firms are in equilibrium, then the industry is in equilibrium.

Industry is in equilibrium at a price at which the quantity demanded is equal to the quantity supplied. The industry demand curve is the horizontal summation of the demand curves of consumers of the product. The industry supply curve is the horizontal summation of the marginal cost curves of all producers. The equilibrium of the industry occurs at the price at which the quantity demanded and supplied are equal and the market is cleared. In the following diagram, the industry is in equilibrium at price P. The total output produced by the industry is OQ.



## LONG RUN EQUILIBRIUM OF THE INDUSTRY

The industry is in long run equilibrium when the price is equal to the minimum long run average cost and firms are making normal profits.

Whenever the price exceeds the minimum LAC there will be a tendency for new firms to enter and lower the price. On the other hand, whenever the price is lower than the minimum LAC, there will be a tendency for firms to leave the industry and make the price move up. When the price is equal to the minimum LAC, there is no further entry or exit of firms in the industry.

### Long run equilibrium conditions :

First, at the prevailing market price each firm must be producing the output that maximizes its profits. This is attained when LMC equals price. In fig 1, the profit maximizing output is Q where

$$LMC = SMC = P = MR.$$

Second, there must be no incentive for firms to enter or leave the industry. This condition occurs when firms are making normal profits. If profits were higher, new firms will enter the industry. If profits were lower, some firms would leave the industry. The entry or exit of firms would affect the level of industry output and change the price. The firms earn just normal profits when the price just covers the long run average cost. This is shown by the tangency between the firm's demand curve and the LAC curve at output Q.

$$LAC = P$$

Third, the combined quantity of output of all the firms at the prevailing price must just equal the total quantity consumers wish to purchase at that price. This condition is shown by the intersection of the long run supply curve S and the demand curve D at price P in Fig (2).

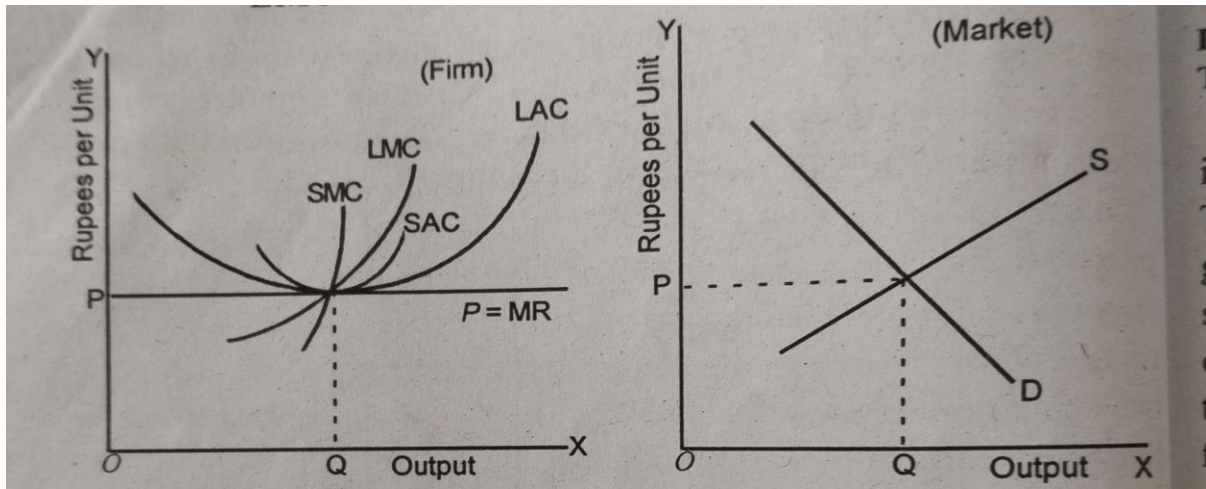


Fig:1

Fig:2

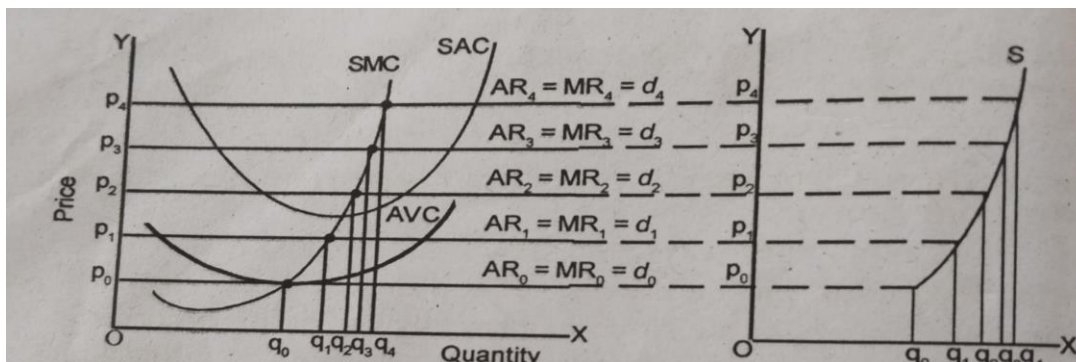
The equilibrium of the industry in the long run is attained when

$$P = MR = SMC = LMC = SAC = LAC$$

### DERIVATION OF THE SUPPLY CURVE OF A COMPETITIVE FIRM FROM THE COST CURVE

The supply curve of a firm shows the amounts of a product it is prepared to put on the market at different levels of prices. The supply curve of the firm in a perfectly competitive market is given by the points of intersection of the marginal cost curve with successive demand curves. In perfect competition, the supply curve of the firm is that part of the marginal cost curve that lies above the minimum point of the AVC curve. The supply curve of the firm slopes upwards to the right.

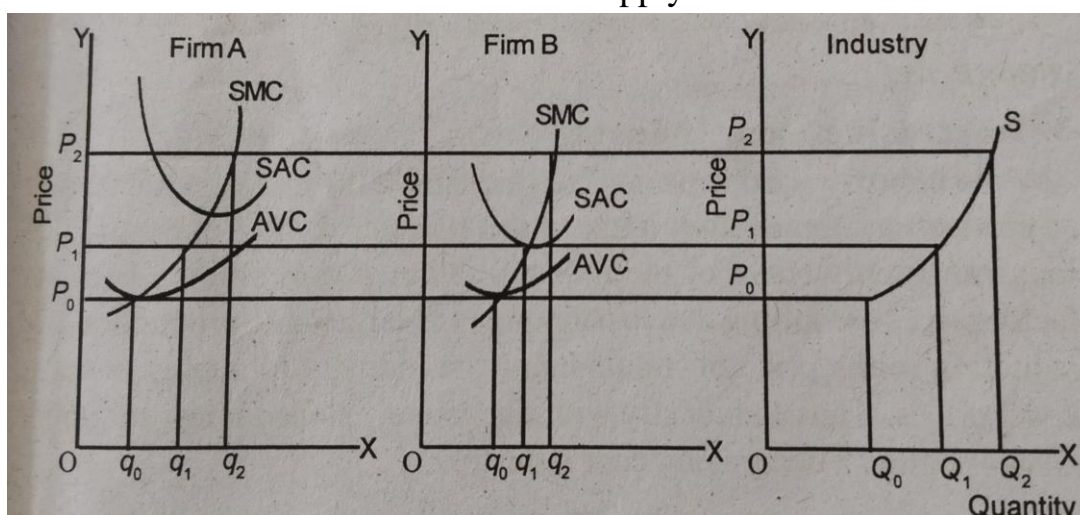
The portion of the MC curve on or above the AVC curve shows the supply curve of the perfectly competitive firm.



## THE SUPPLY CURVE OF THE INDUSTRY

The industry supply curve (market supply curve) in perfectly competitive markets is the horizontal sum of the marginal cost curves (above the level of AVC) of all firms in the industry.

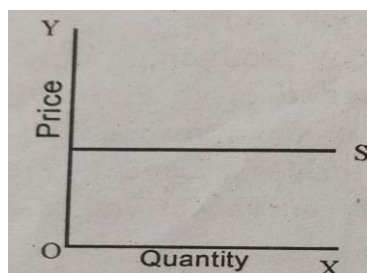
At any given point of time, the total quantity supplied in the market at each price is the sum of the quantities supplied by all firms at that price. The derivation of the industry supply curve in the case of just two firms is shown in the following figure. Firm A's marginal cost curve is added horizontally to the marginal cost curve of firm B to arrive at the market supply curve.



The market supply curve derived is a normal one with a positive slope.

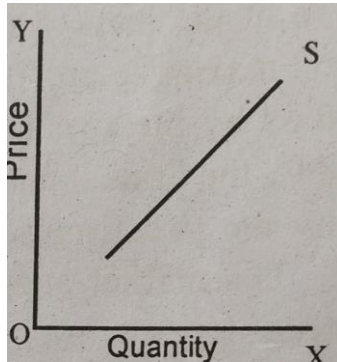
### 1. Constant Cost Industry

An industry is a constant cost industry if the prices of the factors of production employed by it remain constant as industry output expands. The long run supply curve of the industry is horizontal because factor prices are constant. Thus an industry with a perfectly elastic long run supply curve is called a constant cost industry. The long run supply curve is horizontal at the level of minimum LAC.



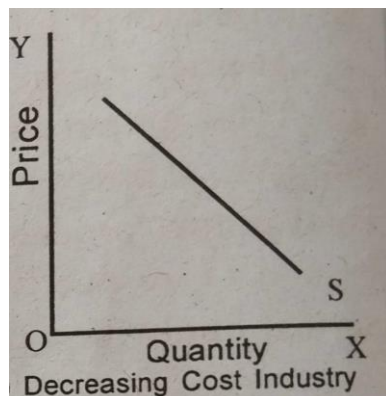
## 2. Increasing Cost Industry

An industry is an increasing cost industry if the prices of the factors of production employed by it increase as industry output expands. The long run supply curve of the industry is upward sloping because factor prices rise as more firms enter the market and existing firms expand production. Thus an industry with a positively sloped long run supply curve is called an increasing cost industry.



## 3. Decreasing Cost Industry

An industry is a decreasing cost industry if the prices of the factors of production employed by it decrease as industry output expands. The long run supply curve of the industry is downward sloping because factor prices are falling due to economies of large scale production. Thus an industry with a negatively sloped long run supply curve is called a decreasing cost industry.



## **OPTIMAL RESOURCE ALLOCATION OF AN INDUSTRY IN PERFECT COMPETITION**

In perfect competition the market mechanism leads to an optimal allocation of resources. The conditions of optimal resource allocation of an industry are the following.

- a. The output is produced at the minimum feasible cost.
- b. Consumers pay the minimum possible price which just covers the marginal cost of the product.
- c. Plants are used at full capacity.
- d. Firms earn only normal profits.

If an economy is producing only two commodities, the optimal resource allocation can be shown by using the PPC and community indifference curves.

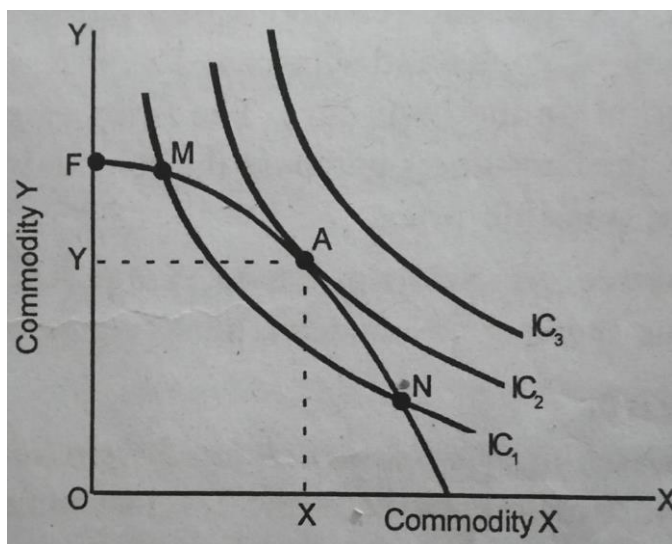
The PPC shows the various combinations of two commodities that an economy can produce by fully utilizing all its resources with the best technology available.

IC shows the various combinations of two goods that are equally preferable to an economy. Given the PPC and consumers preferences, perfect competition will lead to the optimal allocations of resources under the following conditions.

1. Consumers sovereignty reflects the correct ranking of preferences of the community.
2. There are no unexhausted economies of scale in any one industry.
3. There is no growth in the economy, that is, the resources and technology are given.

Optimal resource allocation is shown by the point of tangency of the given PPC with the IC. At this point  $MRS = MRT$  because the slopes of PPC and IC are equal.





At point A resources are fully utilized and the consumers attain the highest level of welfare. The optimal allocation is attained when the economy produces OX of commodity X and OY of commodity Y.

### **ADVANTAGES OF PERFECT COMPETITION**

The following are the important advantages of perfect competition.

#### **1. Higher Level of Output :**

The volume of output produced in perfect competition will be greater than that of any other market forms.

#### **2. Efficiency in Production :**

Perfect competition satisfies the conditions of both productive and allocative efficiency. Thus perfect competition is Pareto optimal.

#### **3. Better Utilisation of Resources :**

The resources of the economy are used most efficiently to produce the goods and services. This is attained when a firm produces at the lowest point on the LAC curve.

#### **4. Low Production Cost:**

The existence of perfect competition in the factor market enables a firm to produce the commodities and services at the lowest possible cost.

#### **5. Lower Price :**

The resources are used most efficiently in the production of goods and services. The firms are operating at the lowest point on the LAC curve.

## 6. Absence of Selling Costs

The products are homogeneous there is no need for incurring selling costs.

### **Optimum Firm:**

An Optimum firm is one which has reached its most efficient size. The most efficient size is the level of output at which the LAC will be at a minimum. In such a situation, the firm has no tendency to expand or reduce the scale of production.

The optimum size of a firm is not a fixed one. It is likely to change between industries. The optimum size may change as a result of changes in the relative prices and efficiency of factors of production or due to the development of new techniques of production.

## **ECONOMIC EFFICIENCY**

Economic efficiency or Pareto optimality is associated with the allocation of resources. An allocation of resources is efficient, when it is not possible, through any feasible change in resource allocation, to benefit one person without making any other person worse off.

A situation in which it is impossible to make any one better off without making some one worse off is said to be Pareto efficient or Pareto optimal. This criterion of efficiency was introduced by the Italian economist Vilfredo Pareto. When the economy is operating efficiently the welfare of an individual cannot be improved without a reduction in the welfare of others.

### **Conditions of Economic Efficiency (Marginal Conditions of Pareto Optimality)**

#### **1. Efficiency in the Distribution of Products**

The condition for efficient distribution of commodities among consumers requires that the MRS between two goods be equal for all consumers.

$$\text{MRS A}_{xy} = \text{MRS B}_{xy}$$

#### **2. Efficiency in the Allocation of Inputs**

The condition for efficient allocation of inputs requires that the MRTS between two inputs (labour and capital) be equal in the production of all commodities.

$$\text{MRTS X}_{LK} = \text{MRTS Y}_{LK}$$

### **3. Efficiency in the Output Mix**

The condition output mix requires that the MRPT between any two commodities be equal to the MRS between the same two goods.

$$\text{MRPT}_{xy} = \text{MRS}_A_{xy} = \text{MRS}_B_{xy}$$

### **TECHNICAL EFFICIENCY**

Technical efficiency in production mean that producers substituting one factor for another or reorganizing the scale of production can obtain no increase in output. A particular allocation of inputs into the production process is technically efficient if the output of one good cannot be increased without decreasing the output of another good. Thus technical efficiency measures the use of inputs in physical terms.

### **ALLOCATIVE EFFICIENCY**

Allocative efficiency relates to the allocation of resources to the production of all the goods and service in an economy. Resources should be allocated in an optimal way among different products. The right quantity of each good should be produced. This is usually called allocative efficiency. Allocative efficiency is achieved when price equals marginal cost for each product.

### **PRODUCTIVE EFFICIENCY**

A firm is productively efficient if it produces a given level of output at the lowest possible cost. Any firm that is not being productively efficient is producing at a higher cost than is necessary.

### **EFFICIENCY IMPLICATIONS OF PERFECT COMPETITION**

Perfect competition is the most efficient form of market structure because it ensures productive efficiency and allocative efficiency.

#### **Productive Efficiency**

Production is efficient when it is impossible to reallocate resources so as to produce more of some product without producing less of some other product. Productive efficiency has two conditions. The first condition of productive efficiency is that each firm should produce any given output at the lowest possible

cost. When the perfectly competitive industry is in long run equilibrium, the firm produces at the lowest point on its LAC. Thus any perfectly competitive profit maximizing firm will be productively efficient.

The second condition for productive efficiency is that all firms producing the same product should have the same marginal cost.

### **Allocative efficiency**

Allocative efficiency means that it is impossible, by producing a different bundle of goods, to make any one person better off without making at least one other person worse off. The economy's allocation of resources is efficient when the marginal cost of producing each good is equal to its market price. When marginal cost equals price in all industries it is impossible to reallocate resources between alternative lines of production and increase consumer satisfaction. A perfectly competitive economy is allocatively efficient because it equates marginal cost to price in all lines of production.

To summarize, when a perfectly competitive industry is in long run equilibrium,  $P=LAC=LMC$  for each firm in the industry. Since  $P=LAC$ , the perfectly competitive firm earns zero economic profits and so there is distributional efficiency. Since  $P=LAC$ , each firm produces at the lowest point on its LAC curve and so there is productive efficiency.

## **MARKET FAILURE**

Market failure is a situation in which an unregulated competitive market is inefficient because prices fail to provide proper signals to consumers and producers. There are two important instances in which market failure can occur.

**Externalities:** Sometimes the actions of either consumers or producers result in either costs or benefits that do not reflect the market price. Such costs or benefits are called externalities because they are "external" to the market.

**Lack of Information:** Market failure can also occur when consumers lack information about the quality or nature of a product and so cannot make utility

maximizing purchasing decisions. Government intervention (eg, requiring truth in labeling) may then be desirable.

## **WELFARE EFFECTS OF GOVERNMENT INTERVENTION**

The welfare effect of a government intervention in the market is evaluated by analyzing the changes in market price and quantity that such interventions cause. The government can intervene in the market by imposing a price ceiling. Government imposed legislated maximum prices are called ceiling prices. If the government fixes the price below the equilibrium price and prevents it from rising to the equilibrium price, it is called a price ceiling. A government-imposed price ceiling causes the demand for the commodity to rise and the quantity supplied to fall.

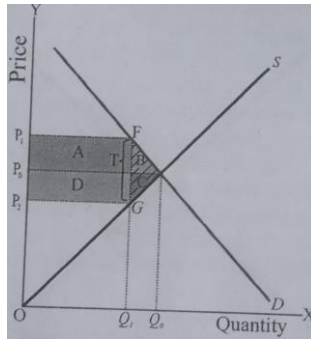
The welfare effect of the price ceiling is measured by the changes in consumer and producer surplus.

## **IMPACT OF A TAX**

The impact of imposing a specific tax on the price and quantity of the commodity is explained in the following figure. A specific tax is a tax of a certain amount of money per unit sold.  $D$  is the demand curve and  $S$  the supply curve. Without the tax the equilibrium price is  $P$ . This is the price paid by the buyers and received by the sellers. The equilibrium quantity is  $Q_0$ . Assume the government wishes to impose a tax rate of  $T$  rupees per unit on a commodity. Buyers move up the demand curve and sellers move down the supply curve until the vertical distance between the two is equal to  $T$  as shown by the points  $F$  and  $G$ .  $P_1$  is the price buyers pay and  $P_2$  is the price sellers receive. The difference  $P_1 - P_2 = T$  is the tax the government collects. From the buyers' point of view the price has risen from  $P_0$  to  $P_1$ , but from the sellers' point of view the price has fallen from  $P_0$  to  $P_2$ . At the price  $P_1$  the quantity demanded is  $Q_1$ , and at the price  $P_2$ , the quantity supplied is again  $Q_1$ .

The price buyers pay rises by half of the tax and the price that sellers receive falls by roughly half of the tax. Because buyers now pay a higher price, the reduction in consumer surplus is equal to the area of the rectangle  $A$  plus the area of the triangle  $B$ . Because sellers now receive a lower price, the reduction in producer surplus is

equal to the area of the rectangle D plus the area of the triangle C. Government tax revenue is equal to the sum of the rectangles A and D.



### IMPACT OF A SUBSIDY

Subsidy is a payment reducing the buyer's price below the seller's price. Thus subsidy can be considered as a negative tax. Subsidy is the difference between the seller's price and buyer's price. The impact of a subsidy on the price and quantity produced is explained in the following figure. D is the demand curve and S the supply curve. The initial equilibrium price is  $P_0$  and quantity is  $Q_0$ , Assume the government wishes to give a subsidy of  $S$  rupees per unit on a commodity. Sellers move up the supply curve and buyers move down the demand curve until the vertical distance between the two is equal to  $S$  as shown by the points F and G.  $P_2$  is the price sellers get and  $P_1$  is the price buyers pay. The amount of the subsidy is the difference  $P_2 - P_1 = S$ , From the sellers' point of view the price has risen from  $P_0$  to  $P_2$  but from the buyers' point of view the price has fallen from  $P_0$  to  $P_1$ . At the price  $P_2$  the quantity supplied is  $Q_1$  and at the price  $P_1$  the quantity demanded is again  $Q_1$ . The benefit of the subsidy is shared roughly equally by buyers and sellers. The price sellers receive rises by half of the subsidy and the price that buyers pay falls by roughly half of the subsidy. The effect of a subsidy on the quantity is that it will increase from  $Q_0$  to  $Q_1$ .

