

# **Managerial Economics**

## **RAS-501**

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### **Unit-IV**

Market Structure: Market Structure Perfect Competition, Imperfect competition – Monopolistic, Oligopoly, duopoly salient features of price determination and various market conditions

## **UNIT-04**

**Introduction** A **market** consists of all firms and individuals willing and able to buy or sell a particular product. This includes firms and individuals currently engaged in buying and selling a particular product, as well as potential entrants. **Market structure** describes the competitive environment in the market for any good or service. Market structure is typically characterized on the basis of four important industry characteristics: the number and size distribution of active buyers and sellers and potential entrants, the degree of product differentiation, the amount and cost of information about product price and quality, and conditions of entry and exit.

## Market Structure

The function of a market is to enable an exchange of goods and services to take place. A market is that area which brings buyers and sellers into contact with one another. According to Frederic Bentham, “A market is any area over which buyers and sellers are in such close touch with one another, either directly or through dealers, that the prices obtainable in one part of the market affect the prices paid in other parts.” Thus it is not necessary that a market should be in a building or at a particular place; it is also not necessary that buyers and sellers should be physically close to each other. According to Sidgwick, “A market is a body of persons in such commercial relations that each can easily acquaint himself with the rates at which certain kinds of exchanges of goods or services are from time to time made by the others.” In the words of Jevons, “The word market has been generalized so as to mean any body of persons who are in intimate business relations and carry on extensive transactions in any commodity.”

The main feature of a market is that sellers and buyers should be able to get in close contact with each other—may be through telephonic conversation or tele-printer or any such modern device. What is required is that those dealing with each other (buying and selling) should be well informed about prices prevailing and other conditions. Thus, a market is any organization whereby buyers and sellers of a good are kept in close touch with each other. It is precisely in this context that a market has four basic components:

1. consumers,
2. sellers,
3. a commodity,
4. a price.

## Criteria for Market Classification

By categorizing markets in terms of their basic characteristics, it may be possible to identify a limited number of market structures that can be used to analyze decision-making. Although there are many possible ways of categorizing market structures, the following characteristics are frequently employed:

1. **Classification by the area:** When area is used as a basis of market classification, we categorize markets into local markets, regional markets, national markets and international markets. It depends on the manner in which the buyers and sellers are located in a particular place.
2. **Classification by the nature of transactions:** We can classify the market on the basis of nature of transactions into two broad categories: The spot market and the future market.
3. **Classification by the volume of business:** On the basis of the volume of business, the markets are broadly classified into wholesale and retail markets.
4. **Classification on the basis of time:** Some time the time element is used to classify the

market. The time is classified as very short period, short period and long period. Accordingly we have very short period markets, short period markets, and long period markets.

5. **Classification by the status of sellers:** On the basis of the status of sellers the markets are broadly classified into three categories: Primary, Secondary and Terminal markets.
6. **Classification by the nature of competition:** The most important form of market classification is based on the nature of competition i.e., the buyer-seller interaction. The competition in the market depends upon three main factors:
  - (a) Substitutability factor;
  - (b) Interdependence factor; and
  - (c) Ease of entry factor.

## Various Forms of Market

The popular basis of classifying market structures rests on two crucial elements,

- (1) the number of firms producing a product and
- (2) the nature of product produced by the firms that is whether it is homogeneous or differentiated.

The price elasticity of demand for a firm's product depends upon the number of competitive firms producing the same or similar product as well as on the degree of substitution which is possible between the product of a firm and other products produced by rival firms. Therefore, a distinguishing feature of different market categories is the degree of price elasticity of the demand faced by an individual firm. We present in the Table-01 the classification of market forms based on the number of firms and the nature of product produced by them.

**Table -01: A Classification of market forms:**

<i>Form of Market Structure</i>	<i>Number of Firms</i>	<i>Nature of product</i>	<i>Price Elasticity of Demand</i>	<i>Degree of Control</i>
( a ) Perfect Competition	A large no. of firms	Homogeneous Product	Infinite	None
( b ) Imperfect Competition	A large no. of firms	Differentiated products (but they are close substitutes of each other	Large	Some
(i) Monopolistic competition	A large no of firms	Product differentiation by each firm	Large	Some
(ii) Pure oligopoly	Few firms	Homogeneous Product	Small	Some
(iii) Differentiated Oligopoly	Few firms	Differentiated Product	Small	Some
(c) Monopoly	One	Unique Product with close substitute	Very Small	Considerable

## EQUILIBRIUM OF A FIRM

Firm is said to be in equilibrium when it has no tendency either to increase or to contract its output. Firm's equilibrium level of output will lie where its money profits are maximum. Now profits are the difference between total revenue and total cost. So in order to be in equilibrium, the firm will attempt to maximise the difference between total revenue and total cost. An old method of explaining the equilibrium of the firm is to draw the total revenue and total cost curves of the firm and locate the maximum profit point. But, with the appearance of Marginalist Revolution, equilibrium of the firm is explained with the aid of marginal revenue and marginal cost curves.

## Equilibrium of the Firm by Curves of Total Revenue and Total Cost

Profit is the difference between total revenue and total cost. Thus the firm will be in equilibrium at the level of output where the difference between total revenue and total cost is the greatest. Figure-1 depicts short-run total revenue and total cost curves of the firm. As a firm starts from zero output and increases its production of the good, in the very initial stages, total cost is greater than total revenue and the firm is not making any profit at all. When it is producing  $OL$  level of output, total revenue just equals total cost and the firm is therefore making neither profits, nor loss, that is, the firm is only breaking even. Thus the point  $S$  corresponding to  $OL$  output is called break-even point.

When the firm increases its output beyond  $OL$ , total revenue becomes larger than total cost and profits begin to accrue to the firm. It will be seen that profits are rising as the firm increases production up to output  $OM$ . At  $OM$  output, the distance between  $TR$  and  $TC$  is the greatest and so the profits will be the maximum. Thus the firm will be in equilibrium at the  $OM$  level of output. The firm will not produce any output larger than  $OM$  since after it the gap between  $TR$  and  $TC$  curves goes on narrowing down and therefore, the total profits will be declining. At  $OH$  level of output  $TR$  and  $TC$  curves again intersect each other, which means that total revenue is equal to total cost at output  $OH$ . Thus point  $Q$  is again a breakeven point.

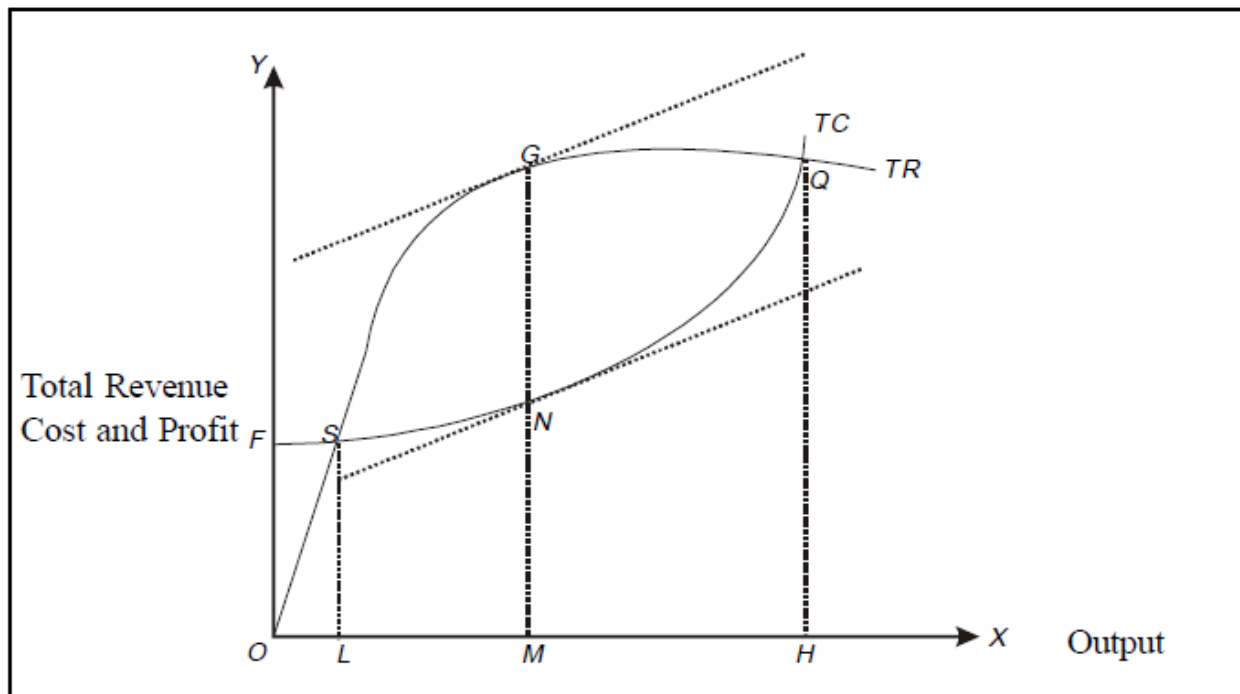


Figure-1

## Equilibrium of the Firm by Marginal Revenue and Marginal Cost

The firm will be making maximum profits by expanding output to the level where marginal revenue is equal to marginal cost. If it goes beyond the point of equality between marginal revenue and marginal cost, it will be incurring losses on the extra units of output and therefore will be reducing its total profits. Thus, the firm will be in equilibrium when it is producing the amount of output at which marginal revenue equals marginal cost. It will be earning maximum profit at the point of equality between marginal revenue and marginal cost. Therefore, the condition for the equilibrium of the firm is that the marginal revenue should be equal to the marginal cost. In Figure-2 firm's marginal revenue curve  $MR$  is sloping downward and firm's marginal cost curve  $MC$  is sloping upward and they cut each other at point  $E$  which corresponds to output  $OM$ . Up to  $OM$  level of output  $MR$  (Marginal Revenue) exceeds  $MC$  (Marginal Cost) and at  $OM$  the two are just equal to each other. The firm will be maximizing its profits by producing  $OM$  output.

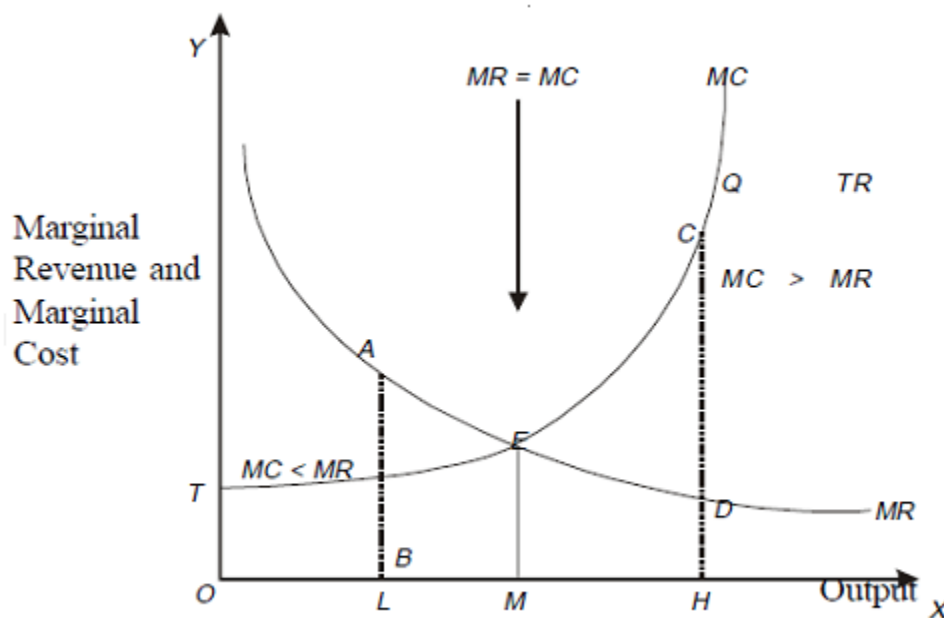


Figure 2

## Perfect Competition

**Introduction:** Perfect competition is said to prevail where there is a large number of firms producing a homogeneous product. Competition is perfect in the sense that every firm considers that it can sell any amount of output it wishes at the prevailing market price, which cannot be affected by the individual producer whose share in the market is very small. With many firms and a homogeneous product under perfect competition, no individual firm is in a position to influence the price of the product and therefore the demand curve facing it will be a horizontal straight line at this level of the prevailing price.

### Meaning of Perfect Competition

Perfect competition is a market structure characterized by a complete absence of rivalry among the individual firms. Thus, perfect competition in economic theory has a meaning diametrically

opposite to the everyday use of this term. In practice, businessmen use the word competition as synonymous to rivalry. In theory, perfect competition implies no rivalry among firms.

The perfect competition is defined as the form of market organization in which

- (1) There are many buyers and sellers of a product, each too small to affect the price of the product;
- (2) the product is homogeneous;
- (3) there is perfect mobility of resources; and
- (4) economic agents have perfect knowledge of market conditions.

## Features of Perfect Competition

Following are the main features of Perfect Competition:

- **Large Numbers of Sellers and Buyers** The industry or market includes a large number of firms (and buyers) so that each individual firm, however large supplies only a small part of the total quantity offered in the market. The buyers are also numerous so that no monopolistic power can affect the working of the market. Under these conditions each firm alone cannot affect the price in the market by changing its output.
- **Product Homogeneity** The technical characteristics of the product as well as the services associated with its sale and delivery are identical. There is no way in which a buyer could differentiate among the products of different firms. If the product were differentiated the firm would have some discretion in setting its price. This is ruled out in perfect competition. The assumptions of large number of sellers and of product homogeneity imply that the individual firm in pure competition is a **price-taker**: its demand curve is infinitely elastic, indicating that the firm can sell any amount of output at the prevailing market price.
- **Free Entry and Exit of Firms** There is no barrier to entry or exit from the industry. Entry or exit may take time but firms have freedom of movement in and out of the industry.
- **Profit Maximization** The goal of all firms is profit maximization. No other goals are pursued.
- **No Government Regulation** There is no government intervention in the market (tariffs, subsidies, rationing of production or demand and so on are ruled out).

The above assumptions are sufficient for the firm to be a price-taker and have an infinitely elastic demand curve. The market structure in which the above assumptions are fulfilled is called **pure competition**. It is different from **perfect competition**, which requires the fulfillment of the following additional assumptions.

- **Perfect Mobility of Factors of Production** The factors of production are free to move from one firm to another throughout the economy. It is also assumed that workers can move between different jobs. Finally, raw materials and other factors are not monopolized and labour is not unionized.
- **Perfect Knowledge** It is assumed that all the sellers and buyers have complete knowledge of the conditions of the market. This knowledge refers not only to the prevailing conditions in the current period but in all future periods as well. Information is free and costless.

## Price determination under Perfect Competition

## Demand and supply

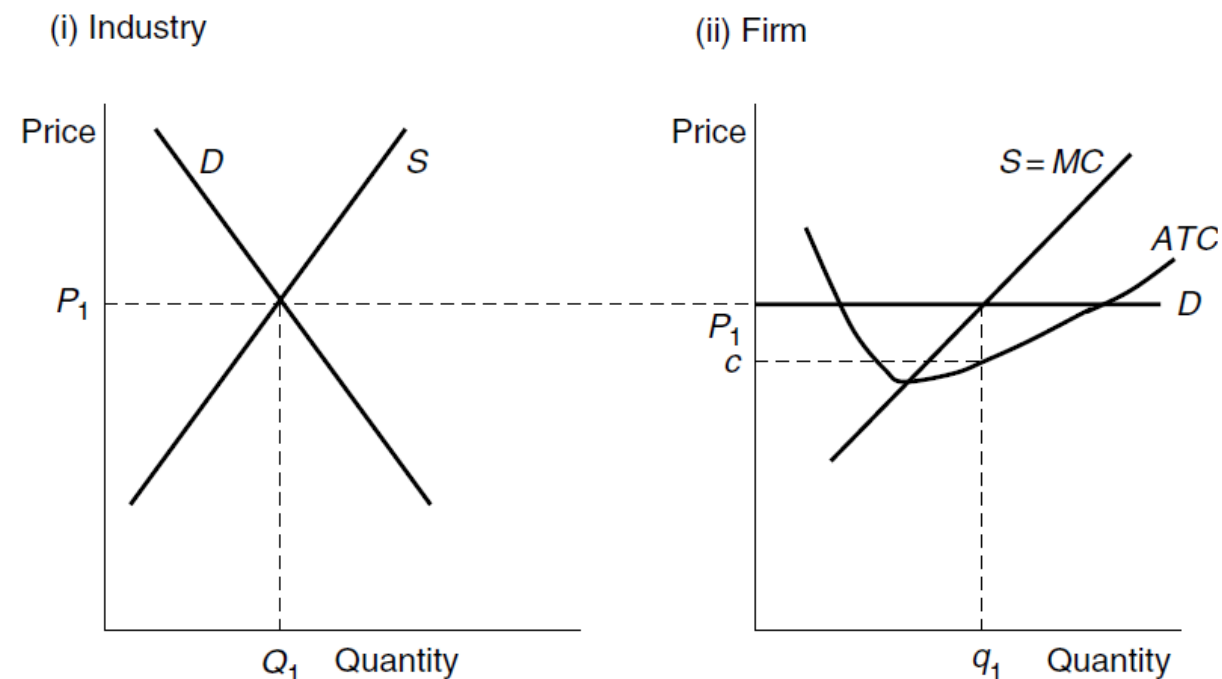
In order to perform either a graphical or algebraic analysis we must consider the determination of demand and supply functions. It is important to distinguish between the individual firm and the industry as a whole; we will discuss the individual firm first.

### a. The firm's demand function

We have just seen that under the conditions of PC the firm will be a price-taker. This means that each firm faces a perfectly elastic (horizontal) demand curve, at the level of the prevailing market price. The economic interpretation of this is that if the firm charges above the market price it will lose all its customers, who will then buy elsewhere, and that there is no point in charging below the market price, because the firm can sell all it wants, or can produce, at the existing price. The level of the prevailing market price is determined by demand and supply in the industry as a whole, as shown in Figure . The demand curve in this case represents both average revenue (AR) and marginal revenue (MR), since both of these are equal to the market price.

### b. The firm's supply function

This refers to the quantities of a product that a firm is willing to put onto the market in a given time period at different prices. In order to derive the firm's supply curve we must make the assumption that the firm wishes to maximize profit. In order to do this it must produce the output where marginal revenue equals marginal cost, as with any firm. Since the firm is a price-taker the marginal revenue is given by the price; thus the firm maximizes profit by producing the output where price equals marginal cost. Therefore, the firm will tend to produce more output as the market price increases, and its supply curve will be its marginal cost curve, as shown in Figure ). More precisely, the firm's short-run supply curve will be that part of its marginal cost curve that lies above the average variable cost (AVC) curve; if the price falls below the minimum level of AVC the firm will shut down production, since it will not be able to cover its variable costs let alone make any contribution to fixed costs.



## Short-run equilibrium in perfect competition

### c. The industry's demand function

This can be viewed as the sum of all the individual consumers' demand functions; graphically, these are summed horizontally.

#### **d. The industry's supply function**

This is obtained by summing the supply functions of all the individual firms in the industry; this is again a horizontal sum when represented graphically. However, this is actually an oversimplification, since when the behaviour of firms is aggregated this has an effect on input prices, bidding them up.

### **Graphical analysis of equilibrium**

We can now show the equilibrium situation for a firm and industry in perfect competition. This is represented as a static short-run equilibrium. The equilibrium market price,  $P_1$ , is determined by the demand and supply functions in the industry as a whole. The firms in the industry, as price-takers, then have to determine what output they will supply at that price. This output,  $q_1$ , is where  $P_1 = MC$ , since this will maximize profit. It is important to distinguish between short-run and long-run equilibrium, as will be explained.

#### **a. Short-run equilibrium**

Whether the situation illustrated in above figure - is also a long-run equilibrium depends on the profit that is made. Since it is assumed that opportunity costs are included in the measurement of unit costs, it can be deduced that if the market price is equal to average total cost (ATC), the firm will just make normal profit. This is defined as the profit that a firm must make in order for it to remain in its current business. If a firm cannot cover all its opportunity costs, meaning that  $P < ATC$ , then it should leave the industry in the long run since the owners of the business can use the resources more profitably elsewhere. If  $P < AVC$  then the firm should shut down in the short run since it cannot even cover its variable costs, let alone make any contribution to fixed costs.

However, if  $P > ATC$ , the firm is making abnormal or supernormal profit. In above figure - (ii) this is given by  $(P_1 - c)q_1$ . This means that the industry is more profitable than average and this will in turn attract new firms into the industry in the long run, since it is assumed that there are no entry or exit barriers. This long-run situation can now be considered.

#### **b. Long-run equilibrium**

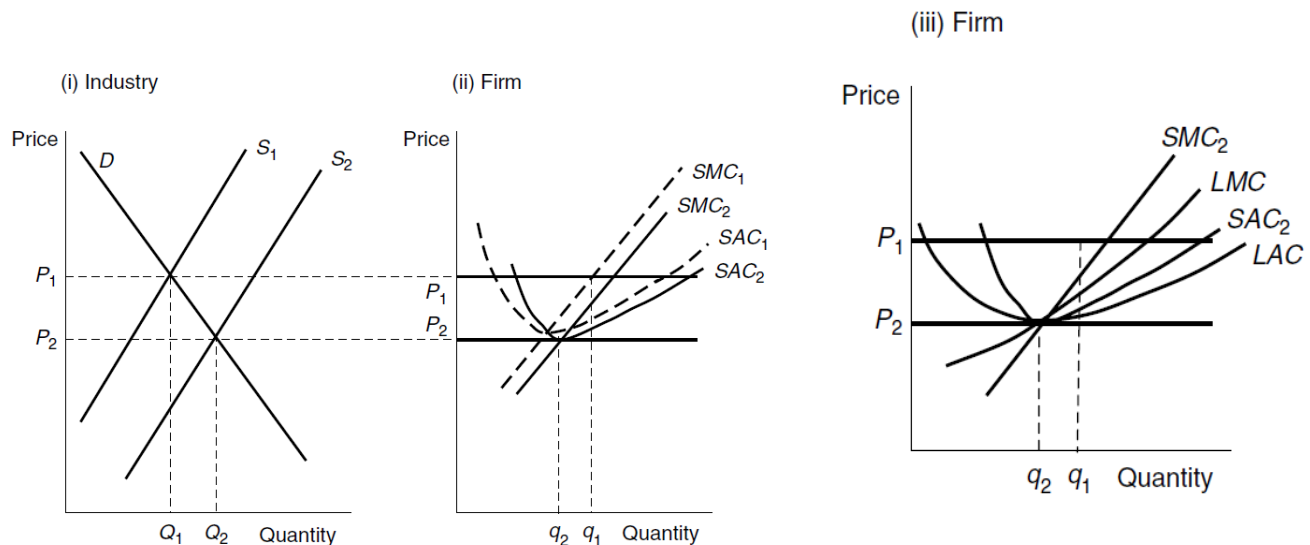
It is possible in the long run for firms to enter or leave the industry; it should be recalled that this is not feasible in the short run, since it involves a change in the level of fixed factors employed. Existing firms can also change their scale and will maximize profit by producing where price equals long-run marginal cost ( $P = LMC$ ). The presence of abnormal profit will always serve to attract new entrants into the industry, and this factor, combined with firms increasing their scale, will shift the industry supply curve to the right, in turn causing the market price to fall. The industry supply curve will shift from  $S_1$  to  $S_2$  in Figure- (i), and the market price will fall from  $P_1$  to  $P_2$ . It is assumed here that there is no change in demand.

In order to aid the visual presentation, two separate diagrams are shown for the firm's situation. Figure- (ii) shows the comparison of the two short-run equilibria, while Figure (iii) compares the new short-run equilibrium with the long-run equilibrium.

At the new equilibrium the price and long-run average cost (LAC) of the firm are equal, and the firm is now producing at the minimum level of both its new SAC curve (SAC2) and its LAC curve at the output  $q_2$ . This is shown in Figure (iii). At this point all the abnormal profit has been 'competed away'. There is, therefore, no further incentive for firms to enter the industry and the firm and industry are in long-run equilibrium. If there were an excessive entry of new firms this would shift the industry supply curve even further to the right, the price would fall below  $P_2$ , and firms would not even be able to make normal profit. Some firms would therefore leave the industry until the price rose back to  $P_2$ .



## Long-run equilibrium in perfect competition



## Imperfect Competition- Meaning and Nature

### Meaning of Imperfect Competition

Imperfect competition is a mid way situation between perfect competition and monopoly. It is a market situation in which imperfections are found in the market. A market is said to be imperfect when any one of the condition of the perfect market is not present in a market. Basically in an imperfect market the demand curve of a firm does not remain perfectly elastic and becomes less elastic. According to Prof. A.P.Lerner, "Imperfect competition exists when a seller faces declining demand curve for his product." Actually imperfect competition is a very wide term and Monopolistic Competition, Oligopoly, Duopoly, Monopsony, etc. all come under it.

### Nature of Imperfect Competition

- Small number of buyers and sellers
- Imperfect knowledge of market
- Product differentiation
- Dominance of Advertisement
- Ignorance and inertia of buyers
- High transportation costs

## Monopolistic Competition

### Meaning of Monopolistic Competition

The concept of monopolistic competition was developed by Prof Chamberlin. It is that type of perfect competition in which a large number of small firms are found to be selling differentiated but quite similar to each other products. Thus, in this type of competition on the one side due to product differentiation each firm is monopolist in his field and is capable of influencing the price of the product. On the other hand as the products of all the firms are close substitutes or each other due to their similarity, each firm competes with the other firms. This situation arises when the same commodity is being sold under different *brand names*, each brand being slightly different from the others. For example, Lux, Lyril, Rexona, Hamam, Lifeboy, etc. brands of soap, or Colgate, Cibaca, Prudent, Promise, etc. brands of toothpaste.

In the words of Stonier and Hague, “There is competition which is keen, though not perfect, between many firms making very similar products.”

This type of market structure, where there is competition among a large number of “monopolists” is called monopolistic competition.

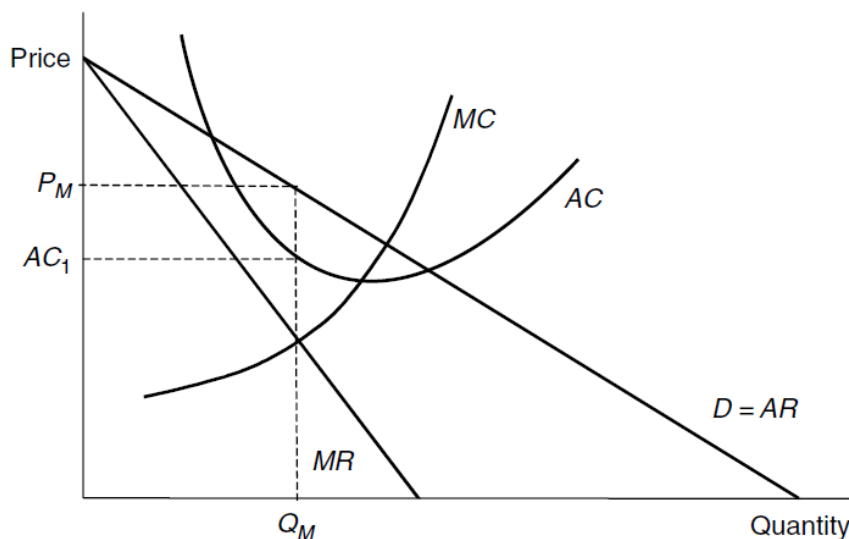
### Features of Monopolistic Competition

- Large number of sellers
- Competition among sellers
- Product differentiation
- Free entry and exit of the firms
- Non price competition
- Selling cost
- Steeper demand curve

### Price determination under Monopolistic Competition

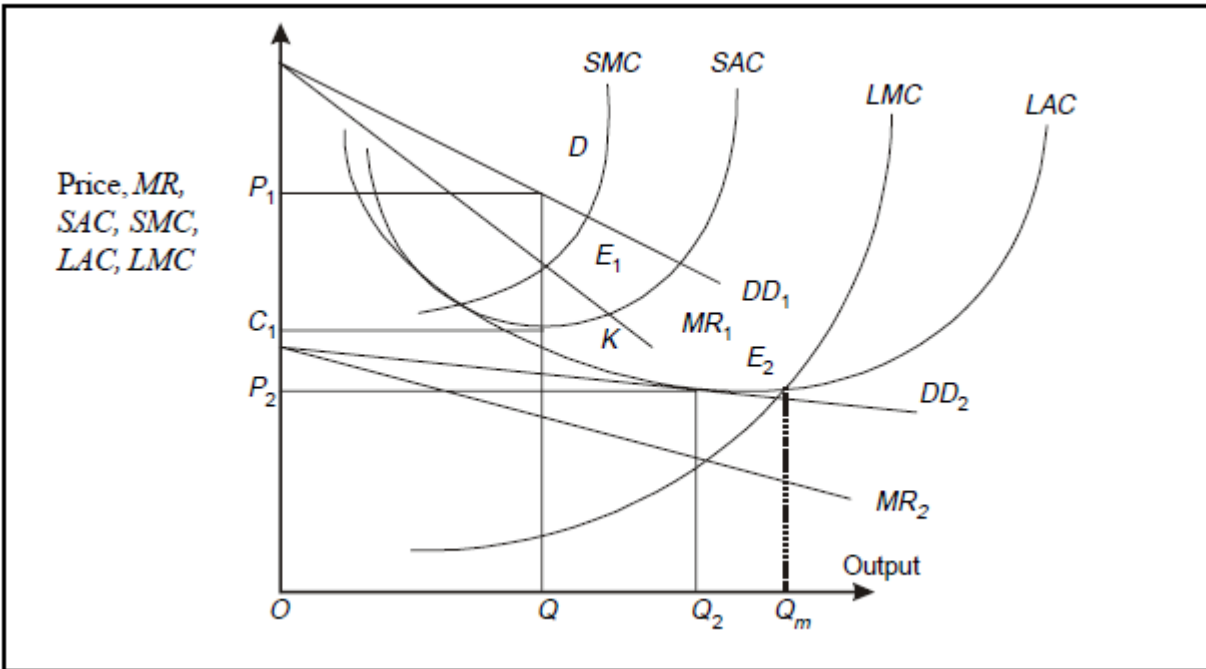
#### Short-run equilibrium for firms in monopolistic competition

In the short run the equilibrium of the firm in monopolistic competition is very similar to that of the monopolist. Profit is again maximized by producing the output where  $MC=MR$ . Supernormal profit can be made, depending on the position of the AC curve, because the number of firms in the industry is fixed. The only real difference between the two situations is that in Figure-1, relating to monopolistic competition, the demand curve (and hence the MR curve) is flatter than the demand curve in relating to monopoly. This is because of the greater availability of substitutes.



#### Long-run equilibrium through new entry competition

Under monopolistic competition, the number of independent firms selling differentiated products or brands of a given commodity is large and the relative market share of every firm is insignificant. Therefore, the entry of a new firm into the market will not have any noticeable adverse effect on the sales (or demand) of any of the established firms. Established firms will have no reason to react to new entry by adopting practices to discourage this. Moreover, there are no legal or non-legal (economic) barriers against new entry. Hence, when high profits of the existing firms attract new entry, new firms will in fact enter the market.



The process by which competition from the entry of new firms leads an individual firm's long-run equilibrium is explained with the aid of above figure. The initial downward sloping demand curve of the firm is  $DD_1$  and  $MR_1$  is the corresponding marginal revenue curve.  $SMC$  and  $SAC$  are the short-run marginal cost and short-run average cost curves. We see that the  $SMC$  curve cuts  $MR_1$  from below at point  $E_1$ . The firm maximizes profits at output  $Q_1$  and charges price  $OP_1$  or  $Q_1D_1$ . At  $Q_1$  output  $SAC = OC_1$ . It makes super-normal profits = area  $P_1DKC_1$ . The super-normal profits of existing firms induce new firms to enter this market. As the number of firms and brands increases, the market share of each firm declines and each firm is able to sell less at the same price. Hence, the demand curve of every individual firm slides downwards, remaining parallel to itself. This process of competition from new entry continues so long as the profits earned by a typical firm are more than normal, i.e. so long as the demand curve lies above the  $AC$  curve.

## Monopoly

### Meaning of Monopoly

The term 'Monopoly' is made of two words: 'Mono + Poly'. 'Mono' means single and 'poly' means seller. Hence, monopoly implies such a market situation in which only a single seller exists. Monopoly is said to exist when one firm is the sole producer or seller of a product which has no close substitutes. A few of definitions as given by the eminent economists are as under:

"A monopolist is the only producer of a product that has no close substitutes." – D.S. Watson.

"The term monopoly defines a situation in which a single firm produces a commodity for which there are no close substitutes." – Handerson and Quandt

"A monopolist is any seller who is confronted with a falling demand curve for his product."

A.P. Lerner

On the basis of the above definitions monopoly means a market situation in which there is only a single seller and several or large number of buyers. There is no competitor of a monopolist and there is no close substitutes of the product of a monopolist in the market.

## Features of Monopoly

From above it follows that for the monopoly to exist, following features are essential:

1. Single firm produces and sells a particular commodity or a service.
2. There are no rivals or direct competitors of the firm.
3. No other seller can enter the market for whatever reasons legal, technical or economic.
4. Monopolist is a price maker. He tries to take the best of whatever demand and cost conditions exist without the fear of new firms entering to compete away his profits.

## Merits of Monopoly

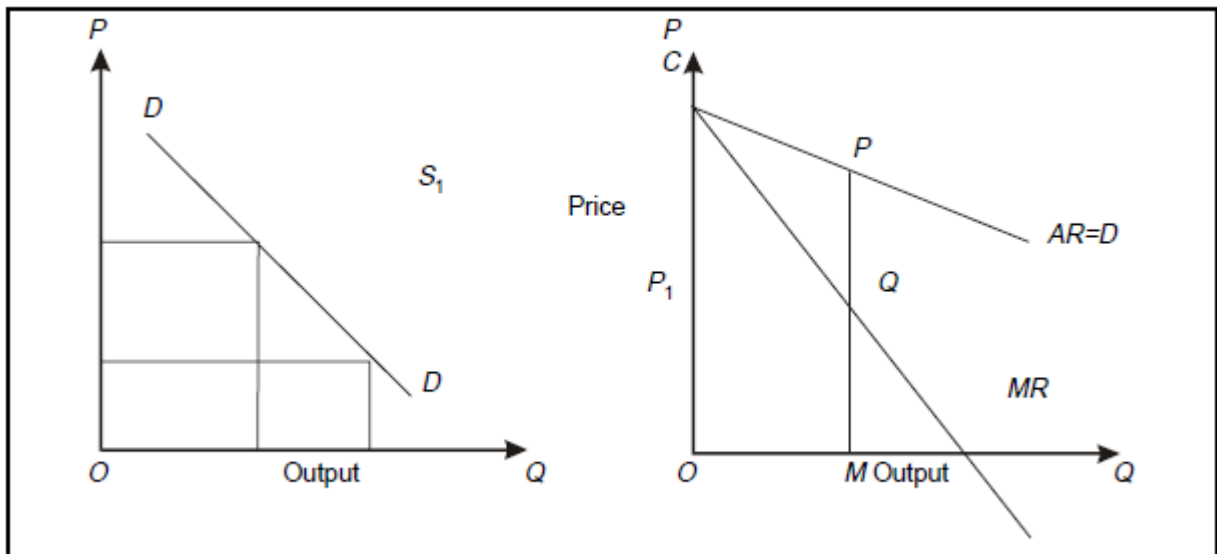
- Economies of large scale
- Low selling costs
- Encouragement to research
- Public utilities
- Possibility of low price

## Demerits of Monopoly

- Consumers' exploitation
- Obstacle to technical progress
- Possibility of unfair trade practices
- Possibility of inefficiency
- Concentration of economic power
- Political corruption

## Price determination under Monopoly

In the case of monopoly one firm constitutes the whole industry. Therefore, the entire demand of the consumers for a product faces the monopolist; which slopes downward. Monopolist can lower the price by increasing his level of sales and output and he can raise the price by reducing his level of sales. Demand curve facing the monopolist will be his average revenue curve, which also slopes downward. Since average revenue curve slopes downward, marginal revenue curve will be below it.



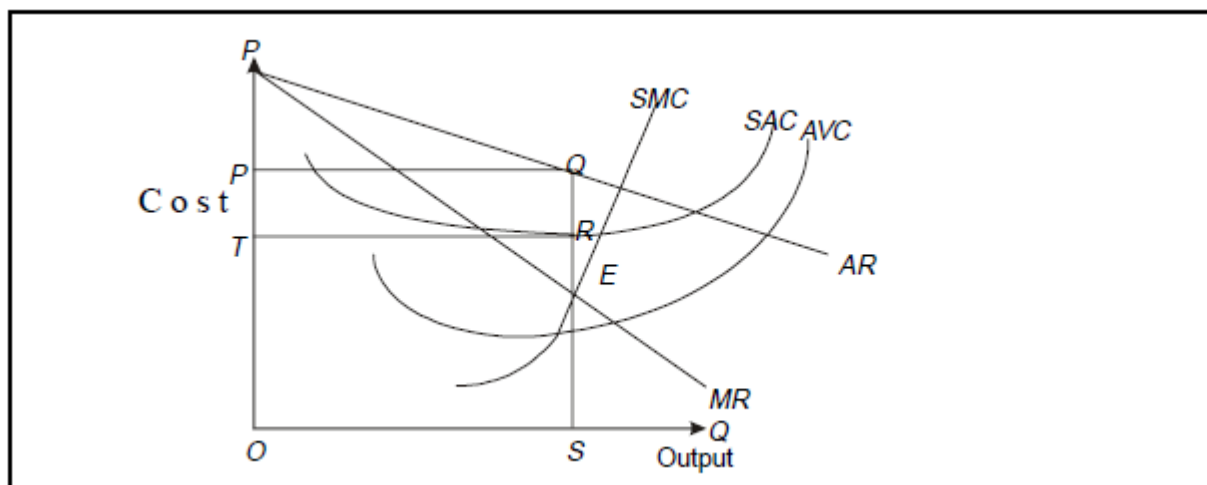
## Short Run Equilibrium

In the short-run the monopolist maximizes his short-run profits or minimizes his short-run losses if the following two conditions are satisfied:

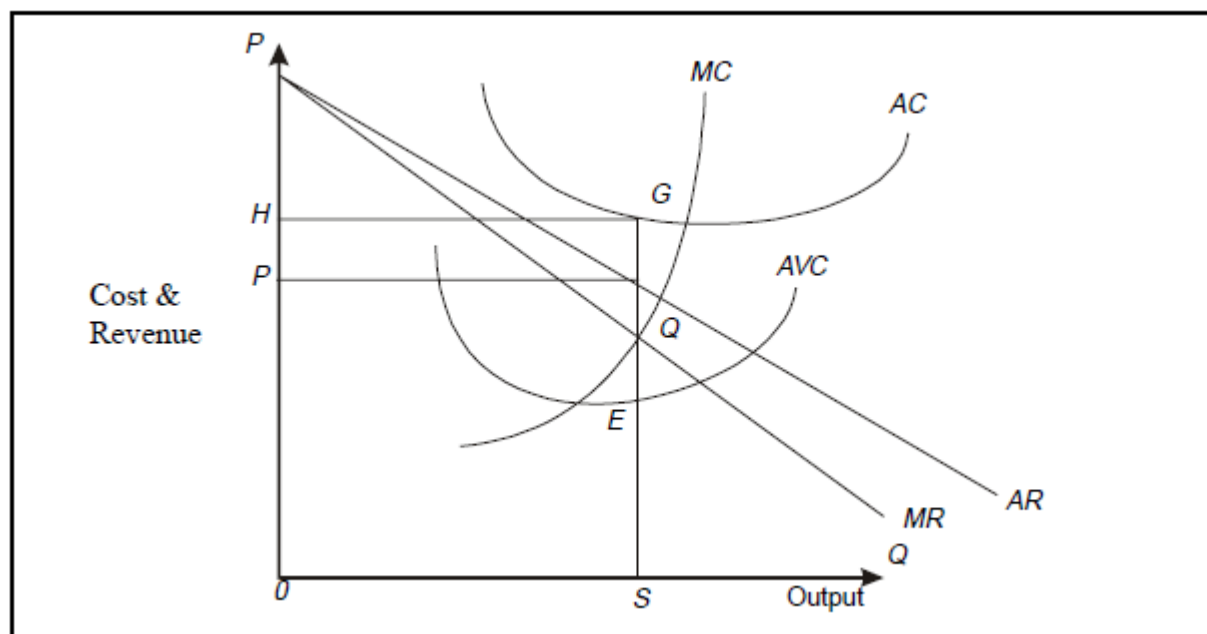
- (i)  $MC = MR$  and

(ii) The slope of  $MC$  is greater than the slope of  $MR$  at the point of their intersection (i.e.  $MC$  cuts the  $MR$  curve from below).

In the short-run a monopolist has to work with a given existing plant. He can expand or contract output by varying the amount of variable factors but working with a given existing plant. Maximisation of profits in the short-run requires the fixation of output at a level at which marginal cost with a given existing plant is equal to marginal revenue. In the following figure  $SAC$  and  $SMC$  are short-run average and marginal cost curves. Monopolist is in equilibrium at  $E$  where marginal revenue is equal to marginal cost. Price set by him is  $SQ$  or  $OP$ . He is making profits equal to  $TRQP$ .



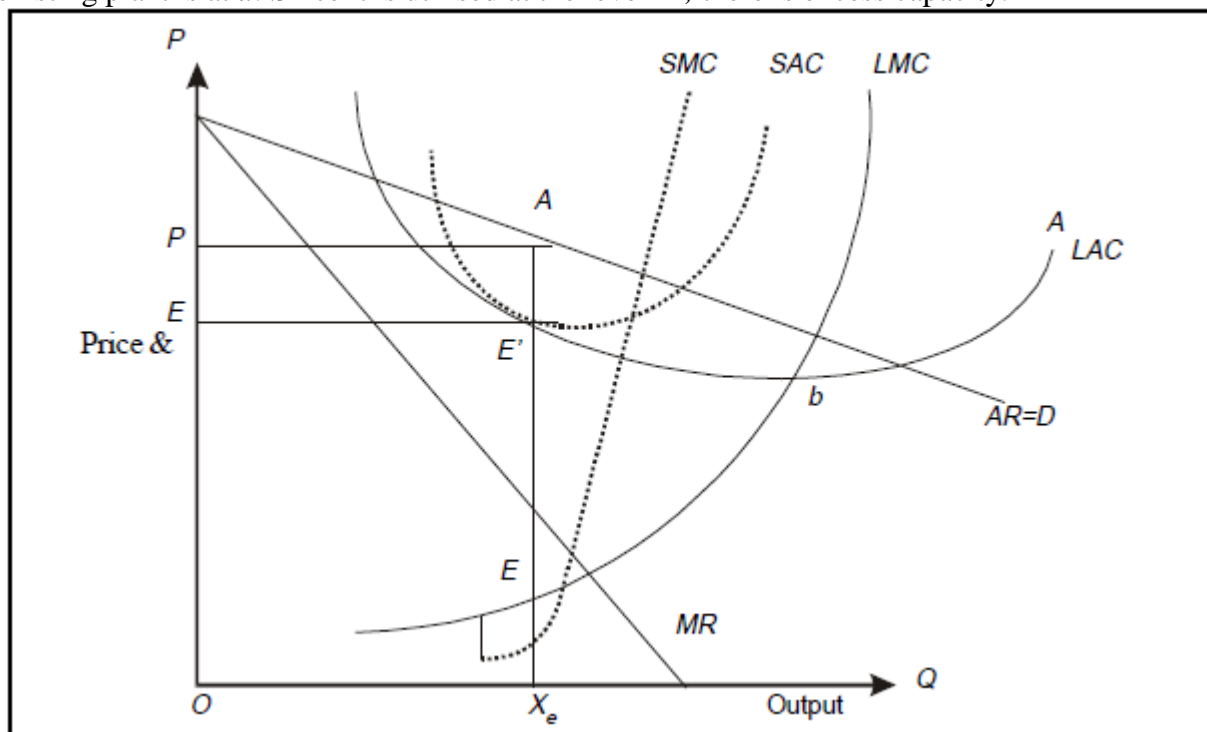
But in the short-run he will continue working so long as price is above the average variable cost. If the price falls below average variable cost the monopolist would shut down even in the short-run. In case of losses, monopoly equilibrium is shown in Figure. The monopolist is in equilibrium at  $OS$  level of output with price  $OP$ . Since the price (or  $AR$ ) is smaller than average cost, he is making losses which are equal to area of the rectangle  $PQGH$ .



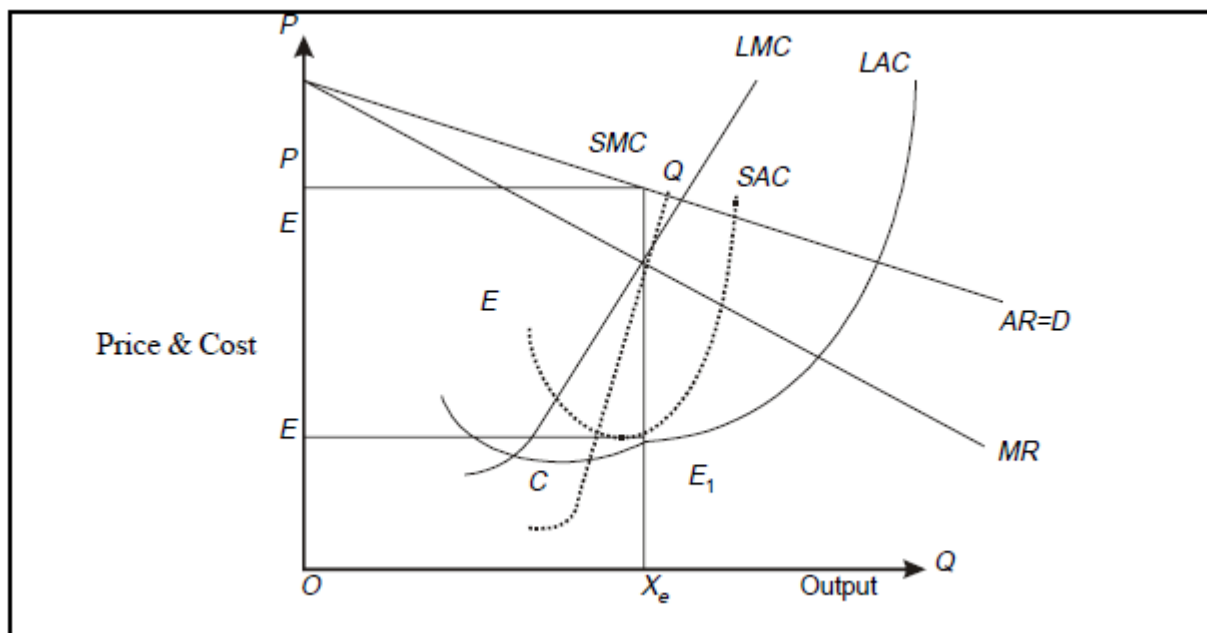
**Figure**

## Long Run Equilibrium

In the long-run the monopolist has the time to expand his plant or to intensively use his existing plant which will maximise his profits. Since there is no entry, it is not necessary for the monopolist to reach an optimal scale. It means that monopolist will not stay in business if he makes losses in the long-run. The size of his plant and the degree of utilization of any given plant size depend entirely on the market demand. He may reach the minimum point of  $LAC$  or remain at falling part of his  $LAC$  and expand beyond the minimum  $LAC$  depending on the market conditions. In Figure we depict the case in which the market size does not permit the monopolist to expand to the minimum point of  $LAC$ . This is because to the left of the minimum point of the  $LAC$  the  $SRAC$  is tangent to the  $LAC$  at its falling part and also because the short-run  $MC$  must be equal to the  $LRMC$ . This occurs at  $E$ , while the minimum  $LAC$  at ' $b$ ' and the optimal use of the existing plant is at  $a$ : Since it is utilised at the level  $E'$ , there is excess capacity.

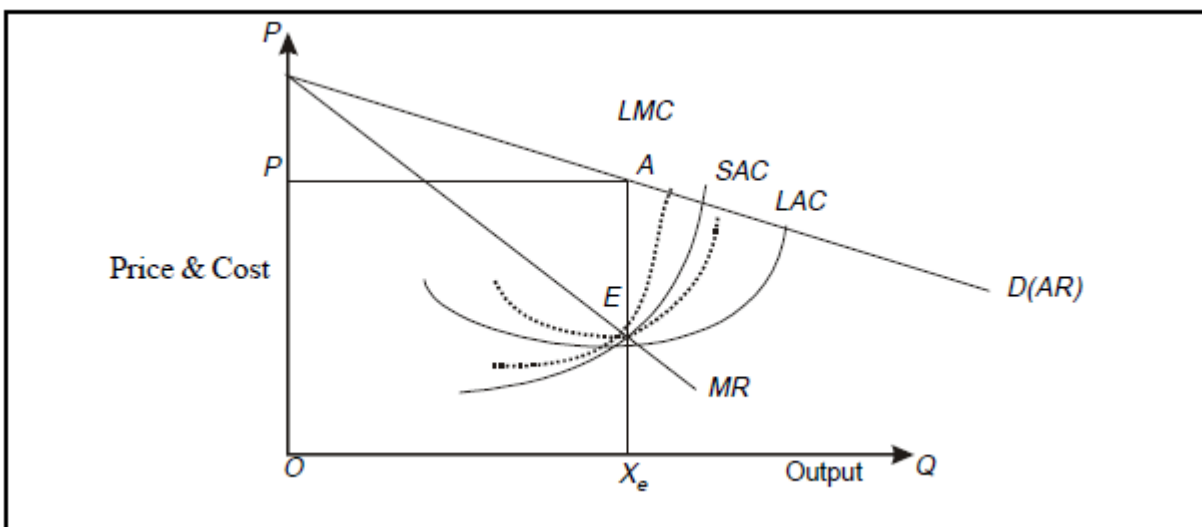


In the Figure- we depict the case where the size of the market is so large that the monopolist, in order to maximise his output, must build a plant larger than the optimal and over utilize it. This is because to the right of the minimum point of the  $LAC$  the  $SRAC$  and the  $LAC$  are tangent at a point of their positive slope and also because the  $SRMC$  must be equal to the  $LAC$ . Thus, the plant that maximizes the monopolist's profits leads to higher costs for two reasons: firstly because it is larger than the optimal size and secondly because it is over utilised.



**Figure**

Finally in Figure- we show the case in which the market size is just large enough to permit the monopolist to build the optimal plant and use it at full capacity. It should be clear as to which of the above situations will emerge in any particular case depends on the size of the market (given the technology of the monopolist).



**Figure**

## Price Discrimination

Price discrimination occurs when the same product or service is sold at more than one price that does not reflect a proportional difference in costs. An airline may sell tickets on a particular flight at a higher price to businessmen than to college students. Companies engage in such practice to enhance profits.

A firm can engage in price discrimination, when following conditions are fulfilled.

1. The firm must have some control over the supply of the product or service. A perfectly competitive seller has no control over price, therefore, he cannot discriminate between different classes of buyers and charge different prices.
2. The different segments of buyers are separable at moderate cost and are unable to transfer products easily from one class to another.
3. The different markets/buyers should have different price elasticity of demand. This may be due to difference in income levels, tastes or availability of products.

From, consumers, viewpoint those in lower price market may benefit compared to Monopoly situations where a uniform price is charged. However, consumers in the higher-price markets are at a disadvantage. The extent to which a seller can separate the market and discriminate between buyers, gives rise to three types of price discrimination.

### First Degree Discrimination

It is assumed that the firm is aware of each consumer's demand curve for the commodity and fixes the price accordingly. The curve indicates the maximum price that can be charged for successive units of output. Figure - shows that  $Q_1$  can be sold for a maximum price of  $P_1$ , the second could be offered for a maximum of price  $P_2$  and so on. The profit maximising output is  $Q_D$  where maximum price obtained for the product is equal to the marginal cost of production. Any attempt to offer more will reduce the profits because price would be less than the marginal cost. A lawyer or doctor may charge different fees based on the income of the clients and patients respectively. Different rates are taken for electricity services for industrial use and residential demand.

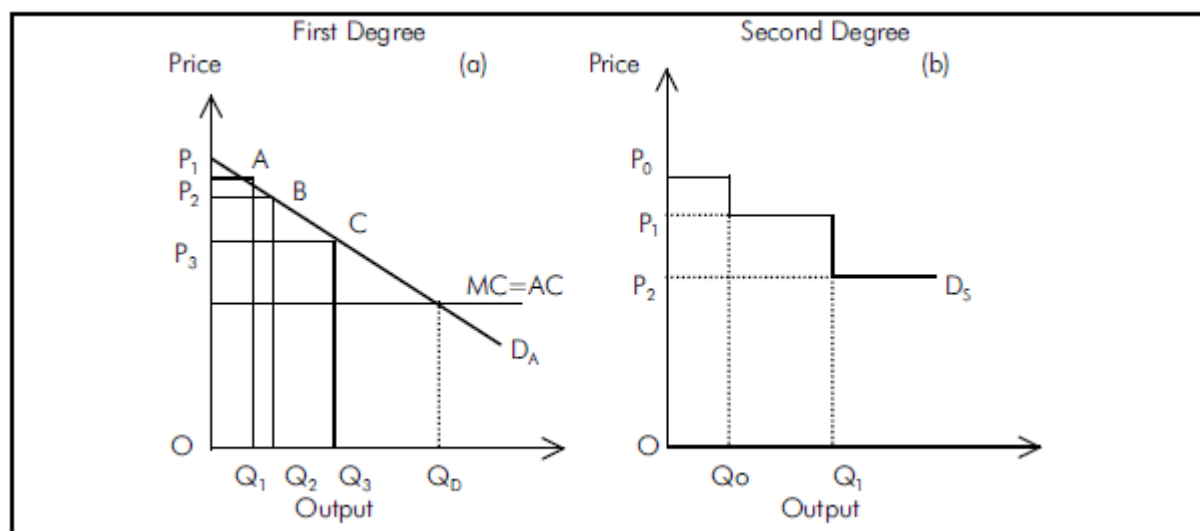


Figure -

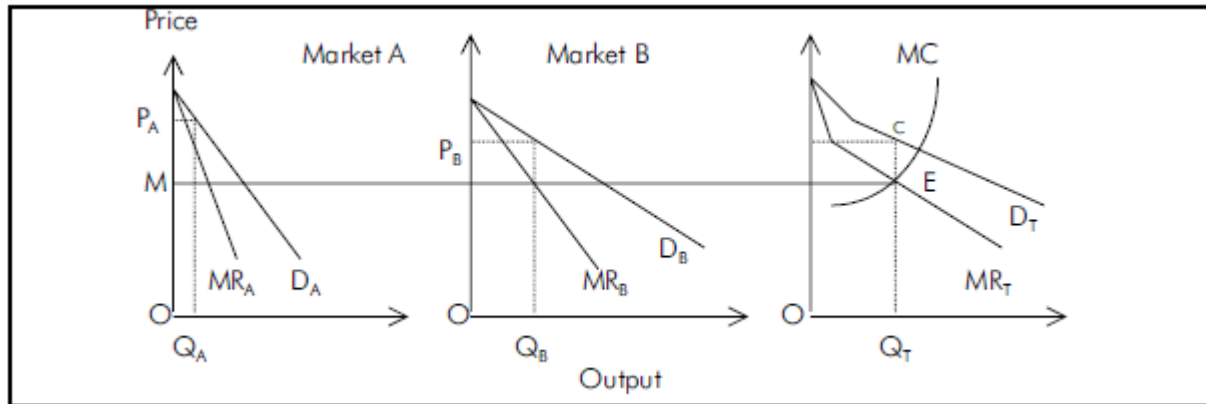
### Second Degree Discrimination

Under this type of price discrimination, differential prices are charged for different amounts of goods and services. The second degree price discrimination is mostly applicable to the goods and services whose consumption is metered like electricity. In Figure - for output less than  $Q_0$ , price  $P_0$  is charged. Medium price  $P_1$  is charged for quantities purchased between  $Q_0$  and  $Q_1$ , and a low price  $P_2$  for purchases beyond  $Q_1$ .



## Third Degree Discrimination

This type of discrimination is most common. The monopolist segregates the customers into different markets and charges different prices in each segment. Market segmentation can be based on location, age, product use or income. Different locations are priced differently even though the cost of offering in each location is same. A theatre varies its seat prices according to audience preferences for different locations.



**Third degree Price Discrimination**

## Oligopoly

### Meaning of Oligopoly

Oligopoly is defined as a market structure in which there are a few interdependent sellers and each controls a significant part of supply and can influence the market price of his product. According to Prof. Leftwich, “Oligopoly is a market situation in which there is a small number of sellers and the activities of every seller are important for others.” George J. Stigler defines oligopoly as “that situation in which a firm bases its market policy in part on the expected behaviour of a few close rivals.”

Under oligopoly the products of different sellers may be homogeneous or differentiated. Where products of rival firms are homogeneous, it is called pure or homogenous oligopoly and where products are differentiated, then it is called differentiated or heterogenous oligopoly. Under pure oligopoly the degree of interdependence between price output policies of the oligopolistic firms is higher than under differentiated oligopoly. Cement, Steel, petrol, cooking gas, chemical, aluminium and sugar industries are example of pure oligopoly whereas automobiles, television sets, soaps and detergents, refrigerators, soft drinks, computers etc. are some examples of industries characterized by differentiated oligopoly.

### Features of Oligopoly

- Few sellers
- Homogeneous or differentiated products
- Interdependence
- Indeterminateness of demand curve
- Price rigidity
- Advertisement and sales promotion activities
- Barriers to entry.

## Emergence of Oligopoly

- Huge capital investment
- Absolute cost advantage
- Patent rights
- Control over natural resources
- Merger and takeover
- Informal collusion

## Duopoly

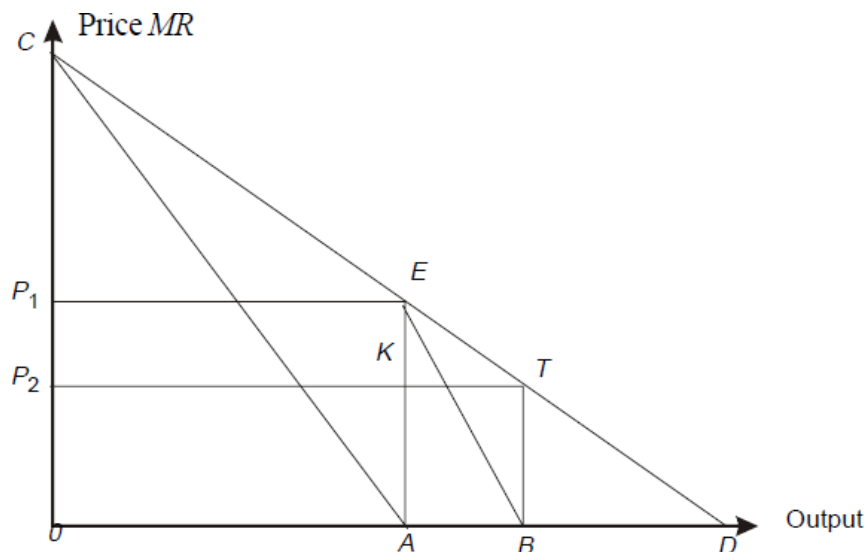
### Cournot Model (Duopoly)

The Cournot model (by Antoine Cournot, 1838) is in terms of duopoly (two sellers) but it can be easily extended to an oligopolistic situation. This model analyses the process of equilibrium in a duopoly situation when each duopolist assumes that his rival will not react when he changes his output to maximize profits.

### Assumptions

1. There are two sellers in the market.
2. The products sold by these two sellers are homogeneous.
3. The market, or total demand curve, is known and it is a straight line.
4. Each duopolist assumes that his rival's output will remain constant when he changes his output. Thus, each duopolist assumes his rival will not react to his action. This is, for each duopolist the conjectural variation or seller-interdependence, as given by  $dQ_1/dQ_2$  or  $dQ_2/dQ_1$  is assumed to be zero. ( $Q_1$  and  $Q_2$  are the outputs of two sellers).
5. Each duopolist produces output of which the profits are at the maximum.
6. The cost of production is zero for both the sellers. For example, two natural springs of mineral water with healing qualities, each owned by one seller. The average and marginal costs for each seller are zero and these curves coincide with the X-axis.

In the following figure,  $CD$  = known straight line total (market) demand curve. Note that under pure competition, Price = marginal cost which is zero by assumption.



Hence, demand or output at zero price shows the competitive output.

...  $OD$  = Competitive output.

Let the two duopolists be denoted by  $X$  and  $Y$ . Let  $Q_x$  and  $Q_y$  be their respective output.

## **Bertrand's Duopoly Model**

This model assumes that his rival firm will keep its price constant irrespective of his own decision about pricing. Thus each firm is faced by some market demand and aims at maximizing its profit assuming that its competitor will not change its price. The model uses the analytical tools of reaction functions of the duopolists derived on the basis of isoprofit curves. These curves are drawn on the basis of various combinations of prices charged by the rival firms for a given level of profit. The equilibrium point is reached where the curves of two firms intersect. The prices at which the two firms will sell their respective outputs is determined by the point equilibrium. This is a stable equilibrium. The assumption that firms never learn from past experience is naive. Each firm maximizes its own profit but the joint profits are not maximized.

## **Edgeworth's Model of Duopoly**

This model also assumes that each seller assumes his rival's price, instead of his output, to remain constant. It is assumed that the entire market is equally divided between the two sellers who face identical demand curves. A continuous price war goes on between the duopolists and the equilibrium price goes on fluctuating. The equilibrium is unstable and indeterminate since price and output are never determined. This model is also based on a naive assumption that each firm continues to assume that his rival will never change its price even if it may change its own.

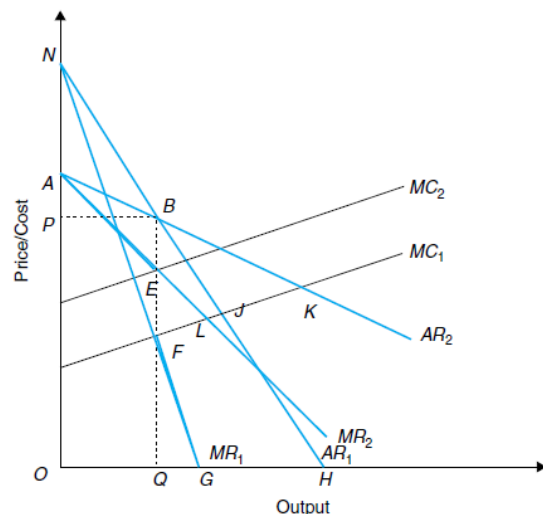
## **Stackelberg's Duopoly Model**

This is an extension of the duopolist model. It assumes that one of the duopolists is sufficiently sophisticated to recognize that his competitor acts on the Cournot assumption. This permits the sophisticated duopolist to determine the reaction curve of his rival and incorporate it in his own profit function. Consequently he maximizes his profit like a monopolist. He emerges as the leader and a stable equilibrium emerges as the naive firm will act as a follower. However, if both firms are sophisticated and act like leaders, disequilibrium results. There will either be a price war until one of the firms' surrenders or collusion will be reached between the two firms.

## **Kinked Demand Curve**

The kinked demand curve model is based on a price conjecture and differentiated products. The price conjecture assesses the reactions of rivals to a fall and an increase in price.

Price reduction: if firm 1 lowers its price, then all other firms producing similar products will either maintain or lower their prices. In this model the firm assumes its rivals will reduce price because they fear losing sales to their cheaper rival. In the following figure the firm is initially at point B on demand curve AR<sub>2</sub>, charging price OP and selling OQ units of output.



If firm 1 considers reducing price to sell more products, then it must be aware of the reaction of its rivals. If no other firm follows its move, then firm 1 will expect to move along the demand curve  $AR_2$  from  $B$  toward point  $K$ , significantly increasing its market share. If rivals lower their prices in response to the price cut, then firm 1 will expect to move along demand curve  $BH$  from  $B$  toward  $J$ . Price increase: if firm 1 were to increase its price, then all other firms producing similar products could maintain or increase their prices. If firm 1 in Figure 9.3 increases its price above  $OP$  and its rivals also increase their prices, firm 1 will move from  $B$  toward  $N$  on demand curve  $AR_1$ . If rivals maintain their price, then firm 1 will expect to move along demand curve  $AR_2$ , from  $B$  toward  $A$ .

If the managers of firm 1 combine the price conjectures, then its anticipated demand curve will be  $ABH$  with a kink at  $B$ . Above the kink (point  $B$ ) the demand curve is relatively more elastic than below the kink, where it is relatively more inelastic. If firm 1 accepts this conjecture, then it may be unwilling to move its price, either up or down, from  $OP$  unless it expects its rivals to follow. The resulting kinked demand curve also has implications for the shape of the marginal revenue curve. For prices above  $OP$  the relevant demand curve is  $ABK$  and the related marginal revenue curve is  $AEL$ . For prices below  $P$  the relevant demand curve is  $NBH$  and the related marginal revenue curve  $NFG$ . Thus, the marginal revenue curve associated with the kinked demand curve  $ABH$  is  $AEFG$ . The  $AE$  element in the marginal revenue curve is associated with the demand curve  $ABK$ , while the  $FG$  portion relates to demand curve  $NBH$ . The element  $EF$  represents a discontinuity in the marginal revenue curve, because the price elasticity of demand at  $B$  on demand curve  $ABK$  is higher than for the same point  $B$  on demand curve  $NBH$ . A profit-maximizing oligopolist would equate marginal revenue and marginal cost. With marginal cost curve  $MC_1$  the profit-maximizing price would be  $OP$ , as it would also be with marginal cost curve  $MC_2$ . In the range  $EF$ , discontinuity in the marginal revenue curve means price will not change even if marginal costs increase from  $MC_1$  and  $MC_2$ . This feature of the model tends to reinforce the unwillingness of the firm to move its price from  $OP$  unless there are compelling reasons to do so and these also apply to competitors.

The kinked demand curve model helps explain why prices are sticky in oligopolist markets and why a firm will resort to non-price competition to help influence demand. The model does not explain how price was established but does help to explain why it does not change.