SUPPLY

Meaning

Supply means the amount offered for sale at a given price. "We may define supply as a schedule of the amount of a good that would be offered for sale at all possible prices at any one instant of time, or during any one period of time, for example, a day, a week and so on, in which the conditions of supply remain the same." (Meyers).

Supply should be carefully distinguished from stock. **Stock is the total volume of a commodity which can be brought into the market for sale at a short notice** and supply means the quantity which is **actually brought in the market.** For perishable commodities, like fish and fruits, supply and stock are the same because whatever is in stock must be disposed of. The commodities, which are not perishable, can be held back, if prices are not favourable. If the price is high, larger quantities are offered by the sellers from their stock. And if the price is low, only small quantities are brought out for sale. In short, **stock is potential supply.**

Law of Supply

Supply has functional relationship with price: **"Other things remaining the same, as the price of a commodity rises its supply is extended, and as the price falls its supply is contracted."** The quantity offered for sale varies **directly** with price, *i.e.*, the higher the price the larger is the supply, and vice versa.

Corresponding to the demand schedule already explained, we can construct an individual's supply schedule. Also, by totalling up the amount supplied at various prices by all the sellers in a market, we can obtain the supply schedule of the market. Supply schedule represents the relation between prices and the quantities that people are willing to produce and sell.

Suppose the following is the (market) supply schedule of apples:

Price per dozen (Rs.)	Quantity supplied (in dozens)
7	43
6	40
5	36
4	31
3	25
2	18
1	10

It will be seen that when price is as high as Rs. 7 per dozen, as many as 43 dozen apples are offered for sale. As the price falls, the amount supplied decreases. When the price is as low as Re. 1 a dozen, only 10 dozen apples are offered for sale. This means that as **price falls supply is contracted, and as price rises supply is extended.** This is the Law of Supply.

The supply schedule given above can be represented in the form of a Supply Curve (Fig. 21.1 given below):
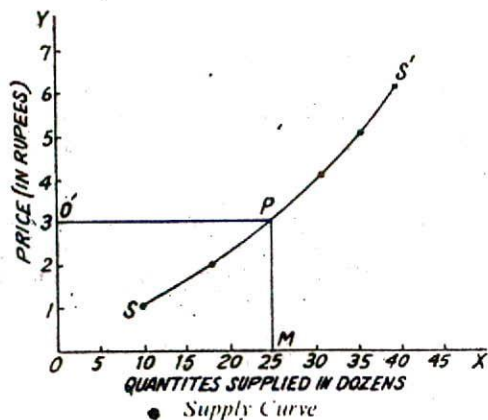

Supply Curve
Fig. 21.1

In this diagram, quantities supplied are measured along OX, and prices along OY, SS' is the supply

curve. If from any point P on the supply curve, PM is drawn perpendicular to OX and PO' to OY, then at PM (=O'O) price, PO' (=OM) quantity will be supplied.

It should be noted that the supply curve slopes downwards from right to left, as contrasted with the demand curve, which slopes from left to right. The reason is that as price falls demand is extended, but supply is contracted; and, conversely, as price rises, demand is contracted, but supply is extended.

If the price falls too much, supply may dry up altogether. The price below which the seller will refuse to sell is called the **reserve price**. At this price, the seller buys his own stock, as it were.

ELASTICITY OF SUPPLY

When a small fall in price leads to great contraction in supply, the supply is comparatively elastic. But when a big fall in price leads to a very small contraction in supply, the supply is said to be comparatively inelastic. Conversely, a small rise in price leading to a big extension in supply shows elastic supply, and a big rise in price leading to a small extension in supply indicates inelastic supply.

The elasticity of supply is really the measure of the ease with which an industry can be expanded and of the behaviour of the marginal costs. If a slight increase in price is followed by the entry of many new firms having minimum average cost equal to price and the marginal cost does not rise, the supply is said to be perfectly elastic. In case, however, the increased output can be obtained only by an infinite increase in price and no new firm is attracted to the industry, the supply will be inelastic. In between these two extremes, there will be different degrees of elasticity. The degree of elasticity will depend, in a particular case, on the slope of the marginal cost curve and the shape of the average cost curves of the successive firms.

The relation between price and the quantity supplied is rather like the relation between a whistle and a dog—the louder the whistle, the faster comes the dog; raise the price and the quantity supplied increases. If the dog is responsive—in economic terminology elastic—quite a small crescendo in the whistle will send him bounding along. If the dog is unresponsive or 'inelastic', we may have to whistle very loudly before he comes along at all."[1]

Measurement of Elasticity of Supply

A vertical straight line will represent absolutely inelastic supply (zero-elasticity) and a horizontal straight line an infinitely elastic supply. In between these two extremes, there will be varying degrees of elasticity. A straight line supply curve drawn

1. Boulding, K.—*Economic Analysis*, 1949, p. 128.

through the origin has a unit elasticity. The following formula is a general measure of elasticity of supply:—
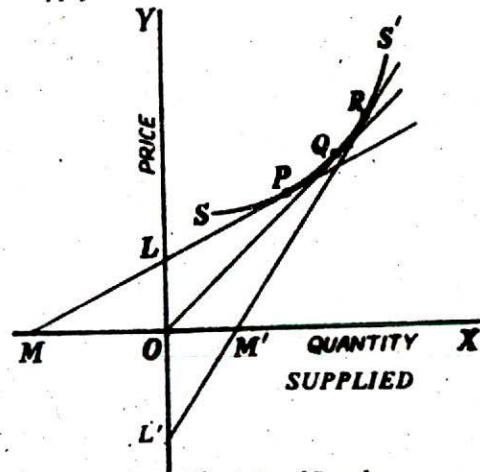
Price Elasticity of Supply

$$= \frac{\text{Proportional change in amount supplied}}{\text{Amount Supplied}} \div \frac{\text{Proportional change in Price}}{\text{Price}}$$

In mathematical symbols, the price elasticity of supply can be expressed as

$$E_s = \frac{\Delta q}{q} \Big| \frac{\Delta P}{P}$$

Here E_s is the price elasticity of supply,

q is the quantity supplied,

Δq is the proportional change in the quantity supplied.

p is the price of the good supplied,

ΔP is the proportional change in the price of the good.

The following diagrammatic method (Figure 21.2) is adopted for the measurement of the elasticity of supply:

Price Elasticity of Supply
Fig. 21.2

SS is the supply curve and three tangents are drawn touching it at P, Q and R and are extended to intersect both axes. For instance, the tangent at P cuts the horizontal axis at M and the vertical axis at L; the tangent at Q cuts both at the origin O, whereas the tangent at R cuts horizontal axis at M' and vertical axis at L'. The price elasticity of supply at a point is measured by the distance along a tangent to the horizontal axis divided by the distance along it to the vertical axis. Thus,

E_s at P is $\dfrac{PM}{PL}$ which is greater than unity since PM is greater than PL.

Es at Q is $\dfrac{QO}{QO}$, which is unity, and

Es at R is $\dfrac{RM'}{RL'}$ which is less than unity since

RM' is less than RL'.

Increase and Decrease in Supply

Economists usually say that, other things being equal, there is a unique demand and supply schedule at any given moment. But other things seldom remain the same. Hence, a change in supply and demand.

Supply is said to increase when, at the same price, more is offered for sale, or the same quantity is offered at a lower price. The supply is said to decrease, when, at same price, less is offered for sale or the same quantity is offered at a higher price. This is illustrated by the accompanying diagram (Fig. 21.3).
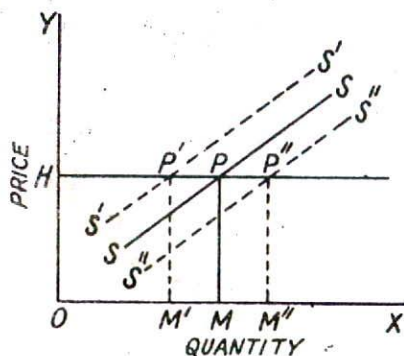
Increase and Decrease in Supply
Fig. 21.3

Suppose SS is the supply curve before the change. S'S' shows a decrease in supply because at the same price PM (= P'M') less is offered for sale, i.e., OM' instead of QM. S''S'' shows an increase in supply because at the same price PM (= P''M'') more is offered for sale, i.e., OM'' instead of OM.

The student should carefully distinguish between the increase in quantity supplied (also known as extension of supply) and increase in supply. Increase in supply means that the whole supply curve has shifted to a new position to the right. It is a new curve altogether, whereas increase in the quantity supplied simply means that more is being offered at a higher price. The supply curve is the same. A movement along the same curve simply indicates changes in quantities offered as a result of a change in price. It does not represent any change in the supply schedule or conditions of supply.

Causes of Changes in Supply

The increase and decrease in supply may take place on account of a number of factors:

(i) Cost of production of a commodity may rise due to increase in the **costs of the various factors of production,** (or resource prices) like raw materials and intermediate products, used in its production. This will result in a decrease in supply. Conversely, a fall in the prices of such factors will lead to greater production and consequently an increase in supply.

(ii) As regards agricultural commodities, **better rainfall, improvement in irrigation, bigger doses of fertilizers; improved seeds and better methods of production** naturally would increase supply. On the contrary, **failure of rains, floods, fires, dust-storms, pests, earthquakes,** etc., will decrease the supply. Food supply recently increased in India owing to larger production brought about by the 'Green Revolution' and larger supply of agricultural inputs like fertilizers, water supply, pesticides, credit, etc.

(iii) Improvement in technique lowers cost of production and increases supply. On the other hand, **higher taxation** imposed on the output of a commodity or on the factors required for its production will decrease the supply.

(iv) Improvement in the means of communication and transport may increase the supply of a particular commodity if imports from foreign countries are encouraged. It may, however, reduce the supply if exports are facilitated.

(v) **Political Disturbances** or a war may disorganise or divert channels of trade and thus create scarcity of certain kinds of goods.

(vi) Supply may be consciously decreased by agreement among the producers, e.g., agreement among the oil producing countries to cut back production. Also, a part of the supply may be destroyed in order to raise prices. During the Great Depression the production of rubber, tea and some other commodities was restricted through international agreements among the producers. Coffee was thrown into the sea in Brazil.

(vii) The supply of goods is also determined by the goals set by the producing firms for themselves. They can decide to produce more or less of a commodity or stop the production of one and undertake that of another.

(viii) The supply of a commodity also depends on the price of that commodity and the prices of other commodities. Higher the price greater is the supply that will come forth: If the prices of other goods are more attractive, then the production of these commodities will be stimulated relatively to a particular commodity.

(ix) The supply also depends on the number of sellers. Entry of more sellers will increase and the exit will decrease the supply.

(x) **Sellers' Price Expectations.** If the sellers fear that the prices will fall in the future, they will hasten to unload the supply now and the supply will increase. On the other hand, expectation of rise in future will induce them to withhold supply and the supply will contract.

(xi) Taxation of output, sales, imports, *etc.*, also affects the supply. By levying high import duties, a government may restrict the supply of a foreign commodity to encourage its production at home, Government may also restrict production of certain articles for reasons of health (*e.g.*, opium in India).

Conclusion. Thus, changes in prices, supply of inputs, production techniques, monopoly control, and taxation are some of the factors which bring about changes in supply.

Supply Function

So far we have discussed the changes in supply in response to certain factors in simple, non-technical terms. We give below practically the same thing in technical terms.

The behaviour of the suppliers of goods follows a general and consistent pattern as they react to some identifiable set of functional supply determinants. Thus the supply function identifies the immediate determinants of supply for all goods. In other words, they explain variations in the quantity of goods supplied. This supply function can be put as under:

$$Qx = F(Px; PY; Pi, T, MT)$$

The supply function is merely a mathematical notation which reads as follows: The quantity supplied of any good Qx varies with the prices of that good Px, the price of other goods Py, the price of factor inputs Pi, technology T and time periods MT. We analyse below these separate functional relationships.

Supply as a Function of Price

This functional relationship can be put in the form of an equation Qx = F (Px). This means that the quantity supplied of good X varies directly with its price. That is if the price of X goes up, its supply would increase, and vice versa. In other words the quantity supplied changes in the same direction as the price of the good concerned. That is, there is a direct functional relationship between a change in the price of a good and change in its quantity supplied. It leads to the law of upward sloping supply (See Fig. 21.1). However, direct relationship between price and quantity supplied is consistent but it is not irrefutable since there are some exceptions. Some factors other than mere change in price may determine the supply of a commodity e.g. change in tastes, weather, fashion, etc.

SUPPLY AS A FUNCTION OF PRICE OF OTHER GOODS

Albert O. Hirschman discusses in his book **"The Strategy of Economic Development** (Ch. 6) econo-mic interdependence as it governs the supply of goods. According to him interdependent relation-ship in supply can be of two types: horizontal and vertical. There is horizontal relationship between goods when they are used at the same stage of production e.g. at the consumption or factor input level. In this case, the two goods compete with each other for the purchaser's choice. Consequently, there will be a unique, pecuniary linkage relationship between the two that is essentially a demand cross elasticity relationship.

But in the case of vertical relationship one good is an input for the production of another. A good has a forward linkage relationship when it is used as a factor input for another, but the good produced has a backward linkage relationship. Whatever the case may be there is an important functional relationship between the price of one good and the supply of another.

When the relationship is horizontal, it is almost always an inverse relationship. That is, if the price of one good rises the demand for the other good will increase. The coefficient of cross elasticity is nega-tive. On the other hand, when the resource transfer-ability is low as between production of say wheat and cars, coefficient of cross elasticity is low or zero.

In the case of forward vertical relationship, an increase in the price of the final product will induce a rise in the price of the factor input. The coefficient of cross elasticity will then be positive. The strength of relationship and the size of the coefficient will depend upon the extent to which one good is uniquely an input for another.

Supply as a Function of The Price of Inputs.

The functional relationship between the supply of a good and the price of its factor inputs is a backward vertical relationship that is always nega-tive. This means that as the price of factor inputs increases, the cost of production must go up which results in decrease in supply reflecting increased relative scarcity of the good. The size of the coeffi-cient of cross elasticity for each of the several factor inputs will depend their relative importance in the production of goods.

Supply as a Function of Technology

It is obvious that technology is the most important determinant of the supply of goods. Applied tech-nology reflects the entrepreneur's talent to make use of scientific discovery, invention and engineering advances in the production process. Technological advance results in the production of new goods, new efficiency levels in production, the development of the new industries and better resource distribution within industries.

Supply as a Function of Marshallian time periods

On the basis of time. Marshall clasified markets in time periods like the market (i.e. at a particular moment), short-run market, long run market, a very long period or secular market. Supply curves rela-tive to time period are discussed in Ch. 27.

Part IV
Product Pricing

22	# MARKET AND MARKET STRUCTURES

MARKET

Meaning of Market

"Originally", says Jevons, "a market was a public place in a town where provisions and other objects were exposed for sale; but the word has been generalised so as to mean **any body of persons who are in intimate business relations and carry on extensive transactions in any commodity.** A great city may contain as many markets as there are important branches of trade, and these markets may or may not be localized . . . . But the **idea of locality is not necessary.** The traders may be spread over a whole town, or region, or a country and yet form a market, if they are, by means of fairs, meetings, published price lists, the post-office or otherwise, in close communication with each other." [1]

In the words of Cournot, a French economist, **"Economists understand by the term market not any particular market place in which things are bought and sold but the whole of any region in which buyers and sellers are in such free intercourse with one another that the price of the same goods tends to equality easily and quickly."**

Thus, the essentials of a market are: (a) a commodity which is dealt with; (b) the existence of buyers and sellers; (c) a place, be it a certain region, a country or the entire world; and (d) such intercourse between buyers and sellers that only one price should prevail for the same commodity at the same time.

Classification of Markets

Markets may be classified:

(a) on the basis of **area** as **local, national** and **world markets;**

(b) on the basis of **time,** as **market price** on any particular day or moment, **short-period price, long-period price,** or **secular markets** covering a generation; and

(c) on the basis of nature of **competition** obtaining therein as **perfect markets** and **imperfect markets.**

Size of the Market

In the case of some commodities, the market is very wide covering the whole country or even the whole world, whereas in certain other cases, the size of the market is very limited covering a small village. The size of the market depends upon several factors:

Character of the Commodity. In order to have a wide market, a commodity must be (i) portable; (ii) durable; (iii) suitable for sampling, grading and exact description; and (iv) such as its supply can be increased. Such commodities are wheat, gold, government securities, *etc.* Bulky articles like bricks and perishable articles like fresh fruit and vegetables have a narrow market.

Nature of Demand. A commodity, which is in universal demand (*e.g.,* gold and silver) will have a wide market. Similarly, a commodity of general consumption has a wide market.

Means of Communication and Transport. The size of the market depends upon the extent to which means of communication and transport have been developed. A properly developed transport and communication system has enabled commodities to be carried long distances and establish wide contacts. This has widened the markets.

Peace and Security. Obviously, goods cannot be marketed in distant places unless peace and order prevail. In war-time, due to insecurity in war zones, markets get restricted. Thus, the extent of the market depends on the peace prevailing in the region.

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1. Quoted by Marshall—*Economics of Industry,* pp. 134-35.

Currency and Credit System. If the currency and credit system of the country are well-developed, marketing can be conveniently and profitably carried on over extensive areas. The extent of the market very largely depends on the state of the currency and the confidence it inspires.

Policy of the State. Markets may be restricted by the policy of the State. Prohibitive duties and quotas restrict the market. The zoning system (*e.g.*, wheat zones) which allows free movement of goods only within a certain zone has the same effect. Thus, the Government policy can also affect the extent of the market.

Degree of Division of Labour. We know that division of labour is limited by the extent of the market. The converse of this is also true. That is, the extent of the market also, in its turn, depends upon the degree of division of labour. The greater the division of labour the cheaper the articles and wider the market.

Perfect and Imperfect Markets

A distinction is made between perfect market and imperfect market. **"A market is said to be perfect** when all the potential sellers and buyers are promptly aware of the prices at which transactions take place and all the offers made by other sellers and buyers, and when any buyer can purchase from any seller and conversely. Under such a condition, the price of a commodity will tend to be the same (after allowing for cost of transport including import duties) all over the market." **Thus the prevalence of the same price for the same commodity at the same time is the essential characteristic of a perfect market.**

On the other hand, a **market is said to be imperfect** when some buyers or sellers or both are not aware of the offers being made by others. Naturally, therefore, different prices come to prevail for the same commodity at the same time in an imperfect market. In a perfect market, on the other hand, the same price rules throughout the market.

Conditions of a Perfect Market

For a market to be perfect the following conditions are essential:—

(i) **Free and Perfect Competition.** In a perfect market, there are no restrictions either on the buyers or on the sellers. They should be absolutely free to buy from or sell to anybody they like. In other words, there should be no monopolies.

(ii) **Cheap and Efficient Transport and Communication.** Same price for the commodity will not rule if the information about changes in prices cannot be quickly transmitted or if the commodity cannot be cheaply and speedily transported. Hence, efficient transport and communication system is essential for a perfect market.

(iii) **Wide Extent.** A perfect market is sometimes considered synonymous with a wide market. We have already discussed above the extent on which the extent of the market depends. In order to have a wide market, a commodity should be portable, durable, gradable and should have a wide demand.

Let us now examine some cases and find out whether the markets are perfect or imperfect.

Market for invested capital (stocks and shares) is the nearest approach to a perfect market, since the stock exchange markets are highly organised.

Markets for precious metals, first-class bills of exchange, foreign currencies and important raw materials are also efficiently organised and may be regarded as perfect.

Markets for consumers' goods, which are retail markets, are less perfect. Retail prices differ appreciably in different localities.

Producers' goods are, as a rule, purchased wholesale; the markets for such goods are more perfect.

Labour market is mostly imperfect. This is due to the comparative immobility of labour, their weak bargaining power and the ignorance that generally prevails in labour circles.

The market for real estate is relatively perfect. Owing to big amounts involved, the buyers take a lot of trouble before they make a purchase.

In the money market, the rate of interest varies according to the risk of default and the period of the loan. Hence, money market may be regarded as imperfect. It is especially so in India.

MARKET FORMS OR MARKET STRUCTURES

The type of market depends on the degree of competition prevailing in the market. Broadly speaking, there are two types of competition prevailing in the markets: (i) Perfect competition and (ii) Imperfect competition.

Perfect Competition and Pure Competition. Modern economists draw a distinction between perfect competition and pure competition. Perfect competition is a wider concept. In order that there should be perfect competition, the market should satisfy not only the conditions of pure competition but also a few more, as we shall show on the next page.

Imperfect competition may also take several forms, *e.g.*, monopolistic competition, oligopoly, duopoly or monopoly.

Thus, at one extreme stands perfect competition and at the other monopoly. In between these two extremes, there are all degrees of competition or lack of competition.

The following chart shows at a glance different types of market forms on the basis of the nature of competition:—

Type of the market	No. of firms	Nature of the commodity
A. Perfect Competition		
Perfect or pure competition	Infinite	Homogeneous
B. Imperfect Competition		
(a) Monopolistic Competition	Many	Differentiated
(b) Perfect Oligopoly	A few	Homogeneous
(c) Imperfect Oligopoly	A few	Differentiated
C. Pure or Absolute Monopoly		
Pure or Absolute Monopoly	One	Homogeneous

Now we shall study these forms in some detail. We take first pure and perfect competition.

Pure Competition

Pure competition is said to exist when the following conditions are fulfilled:—

(i) **Large Number of Buyers and Sellers.** One condition of pure competition is that there should be operating in the market a large number of buyers and sellers. If that is so, no single seller or purchaser will be able to influence the market price, because the output of any single firm is only a small proportion of the total output and of the total demand. Hence, market price has to be taken as given and unalterable by every purchaser and seller. Thus, no individual purchaser can influence the market price by varying his own demand and no single firm is in a position to affect the market price by varying its own output. "Thus, the market price is a parameter to be reacted to rather than a variable to be determined."

(ii) **Homogeneous Product.** The second condition is that the commodity produced by all firms should be standardised or identical. In case all farms produce Kalyan-S wheat, it is immaterial for the purchaser as to who has produced it. He can buy it as well from the one as from the other. This condition ensures that the same price rules in the market for the same commodity. The product of each firm is a perfect substitute for the products of all other firms in the industry.

It is the purchaser's opinion which will determine whether the products are identical or not. Even if the products are really identical, the purchaser may have a prejudice against the output of a particular firm and may consider it different. Hence, under pure competition, the consumers do not differentiate between the products of different firms.

When the quality is the same. the commodities

are perfect substitutes for one another and their cross-elasticity is infinity. In these circumstances, if a firm raises its price, it will lose all the customers. It can sell as much as it likes at the prevailing price. Why should it then think of lowering its price? Hence, a firm cannot raise its price nor need it lower it. That is why the prevailing market price is accepted and acted upon by all the dealers.

If the above two conditions, viz., homogeneous product and large number of buyers and sellers, are found in a market, it is said to be under **pure competition.**

Shape of Demand Curve in Pure Competition

When there is pure competition, the average revenue curve (AR) or demand curve of a firm is a horizontal straight line which means that any firm can sell any quantity at the prevailing price. Since the number of firms is very large, no individual firm has the power to vary the market price. Also, since the products are identical from the consumer's point of view, the price paid by them cannot be different. This is represented by the following diagram. (Fig. 22.1).

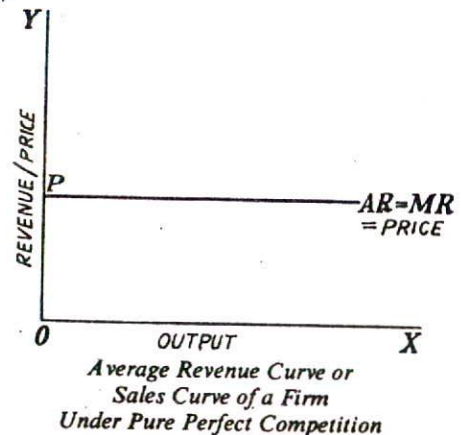*Average Revenue Curve or Sales Curve of a Firm Under Pure Perfect Competition*
Fig. 22.1

OX and OY are the two axes. Along OX is represented the output and along OY the Price/Revenue. At OP price, a seller can sell as much as he likes. He cannot charge more and he will not charge less. If he raises the price, he will lose all his customers and if he charges less, he will be unnecessarily losing.

Examples of pure competition are to be found in the case of farm products, e.g., wheat, cotton, rice, etc. In this case, there is a large number of producers, each producing an insignificant portion of the total market supply. In other fields, we seldom come across pure competition.

Perfect Competition: Conditions

There is said to be perfect competition when every purchaser and seller is so small relative to the

entire market that he cannot influence the market price by increasing or decreasing his purchases or his output.

Perfect competition is a wider term than pure competition. Besides, the two conditions of pure competition mentioned above, *viz.*, the homogeneity of the product and the existence of a large number of dealers, several other conditions must also be fulfilled to make it a perfect competition.

Thus, the conditions of perfect competition are:—

(i) Large number of buyers and sellers.

(ii) Homogeneous product.

(These conditions of pure competition have already been discussed above.)

(iii) **Free Entry or Exit.** There should be no restrictions, legal or otherwise, on the firms' entry into, or exit from, the industry. In this situation, all the firms will be making just normal profit. If the profit is more than normal, new firms will enter and extra profit will be competed away; and if, on the other hand, profit is less than normal, some firms will quit, raising the profits for the remaining firms. But if there are restrictions on the entry of new firms, the existing firms may continue to enjoy supernormal profit. Only when there are no restrictions on entry or exit, the firms will earn normal profit.

(iv) **Perfect Knowledge.** Another assumption of perfect competition is that the purchasers and sellers should be fully aware of the prices that are being offered and accepted. In case there is ignorance among the dealers, the same price cannot rule in the market for the same commodity. When the producers and the customers have full knowledge of the prevailing price, nobody will offer more and none will accept less, and the same price will rule throughout the market. The producers can sell at that price as much as they like and the buyers also can buy as much as they like.

(v) **Absence of Transport Costs.** If the same price is to rule in a market, it is necessary that no cost of transport has to be incurred. If the cost of transport is there, the prices must differ to that extent in different sectors of the market.

(vi) **Perfect Mobility of the Factors of Production.** This mobility is essential in order to enable the firms to adjust their supply to demand. If the demand exceeds supply, additional factors will move into the industry and in the opposite case, move out. Mobility of the factors of production is essential to enable the firms and the industry to achieve an equilibrium position.

Mrs. Robinson thus defines perfect competition: "When the number of firms being large, so that a change in the output of any of them has a negligible effect upon the total output of the commodity, the commodity is perfectly homogeneous in the sense that the buyers are alike in respect of their prefer-

ences (or indifference) between one firm and its rivals, then competition is perfect, and the elasticity of demand for the individual firm is infinite." [2]

Here is a comprehensive definition: "Perfect competition is the name given to an industry or to a market characterised by a large number of buyers and sellers all engaged in the purchase and sale of a homogeneous commodity, with perfect knowledge of market prices and quantities, no discrimination and perfect mobility of resources." [3]

Chamberlin thus brings out the distinction between pure competition and perfect competition: "Purity requires only the absence of monopoly, which is realised when there are many buyers and sellers of the **same** (perfectly standardised) product. Perfection is concerned with other matters as well: mobility of resources, perfect knowledge, *etc.* . . . Perfection is a different thing from its purity, meaning by the latter its freedom from monopoly elements." [4]

Imperfect Competition

Imperfect competition takes three main forms:—

(a) Monopolistic Competition,

(b) Oligopoly, and

(c) Monopoly.

We shall briefly describe below these forms of imperfect competition.

Monopolistic Competition

The main features of monopolistic competition are as under:—

(i) Under monopolistic competition, the number of dealers is not large; at any rate not so large as under perfect competition.

(ii) The products are not homogeneous; they are, on the other hand, differentiated, inter alia, by means of different labels attached to them such as different brands of toilet requisites.

(iii) Either in ignorance or on account of transport costs or lack of mobility of the factors of production, same price does not rule in the market throughout. Rather different prices are charged by different producers for products which are really similar, but are made to appear different through advertisements, high pressure salesmanship and labelling and branding. The result is that each producer comes to have a hold on a clientele from whom he can charge higher prices.

2. Robinson, J.—*The Economics of Imperfect Competition,* 1954, P. 51.

3. Spencer, Milton H.—*Contemporary Economics,* 1971, p. 380.

4. Chamberlin E.—*The Theory of Monopolistic Competition,* 1956, p. 25.

(iv) Under monopolistic competition, the demand curve or sales curve or what is also called average revenue (AR) curve, is not a horizontal straight line. It is, on the other hand, a downward sloping curve. This means that the seller can sell more by reducing price, whereas under perfect competition, he need not reduce the price for he can sell any amount at the prevailing price. Under monopolistic competition, the producer can charge higher prices, because his customers are attached to him.

The seller can thus have a price policy of his own, whereas a seller under perfect competition has no price policy; he has merely to accept the market price.

(v) Thus, under monopolistic competition, the demand for the product is not perfectly elastic; it is responsive to changes in price.

This form of market is a blend of the monopoly and competition and has been called monopolistic competition or 'competing monopolists' by Chamberlin, an American economist. In the real world, we have neither absolute monopoly (i.e., absence of competition) nor perfect competition, but monopolistic competition, i.e., partly monopoly and partly competition. The products are not complete substitutes for one another but they are close substitutes.

As mentioned already, monopolistic competition is only one form of imperfect competition where there is a fairly large number of sellers but products are differentiated. Other forms of imperfect competition are oligopoly and ordinary monopoly.

Oligopoly

When in a market, there are only a few sellers of a product, it is called Oligopoly. The basic characteristic of an oligopolistic situation is the fact that every seller can exercise an important influence on the price-output policies of his rivals. This is due to the fact that the number of sellers is not very large and each seller controls a substantial portion of the supply. Every seller, therefore, is so influential that his rivals cannot ignore the likely adverse effect on them of a given change in the price-output policy of any single manufacturer. This rival consciousness, or the recognition on the part of the seller of the fact of interdependence, is the most important feature of oligopolistic situations.

Oligopoly differs from monopoly and monopolistic competition in this that, in monopoly, there is a single seller; in monopolistic competition, there is quite large number of them; but in oligopoly, there is only a small number of sellers.

Oligopoly Without Product Differentiation

Under oligopoly, the pricing theory is fundamentally the same as in other forms of competition with this difference that the larger the number of firms the greater will be differences in marginal costs and more remote will be the possibility of collusion or agreement whether tacit or explicit. When they all deal in a standardised product and each is producing a considerable portion of the total output, the price and output policy of each producer is likely to affect the others appreciably, but none can foretell precisely how. The price which will be fixed in oligopoly without product differentiation is thus indeterminate.

Oligopoly With Product Differentiation

In case there is product differentiation, monopoly agreements are even less likely. Since products are not similar, any producer in oligopoly can raise or lower his price without any fear of losing customers or immediate reactions from his rivals. Cut throat competition is unlikely. However, keen rivalry among them may create conditions of monopolistic competition. The price, in the long run, may settle at a level between the monopoly price and that in cut-throat competition.

Monopoly

When there is monopoly, a single producer or seller controls the entire market. There are no substitutes for his product. He controls the entire supply and he can fix the price. He is the firm and he also constitutes the industry. It is a one-firm industry. Thus, under monopoly, the distinction between the firm and industry disappears. The average revenue (AR) curve (or the demand curve) always slopes downwards to the right as in monopolistic competition, but it is less elastic in monopoly than in monopolistic competition. In monopoly, there is no need to differentiate products because no close substitutes are available. It is one product, homogeneous and completely under the control of the monopolist.

Market Classifications and Cross Elasticity of Demand

Some economists (e.g., Triffin) have used the concept of cross elasticity of demand for measuring the extent of competition among the firms. In this way, on the basis of the cross elasticity of demand an attempt has been made to classify the market structures. In other words, we can distinguish between the various types of market situations on the basis of cross elasticity of demand. Stonier and Hague observe in this connection, "In perfect competition, the cross elasticity of demand for the product of a single firm with respect to a change in the price of the rest of industry will be infinite. That is to say, the proportionate fall in the demand for the product of a single firm will be infinitely large compared with any given proportionate fall in the price of the product of the whole industry. Similarly,

in monopolistic competition, the cross elasticity of demand for the product of a single firm with respect to a change in the price of the other products made in the monopolistic 'group' will be very high. The cross elasticity of demand for the product of a monopolist with respect to a fall in the price of other products in the economy will be very low."[5] In other words, when the cross elasticity of demand is infinite, it is a case of perfect competition; when it is very high it is a case of monopolistic competition and when it is very low, it is a case of monopoly.

But cross elasticity of demand is a very unsatisfactory measure of the extent of competition pervailing in the market. It has been pointed out by some economists (e.g., Chamberlin) that cross elasticity of demand of any perfectly competitive firm is zero (and not infinity). As mentioned above, under monopoly also cross elasticity of demand is zero. Hence on the basis of cross elasticity, the two market situations of pure competition and pure monopoly are lumped together whereas they are two opposite extreme cases. In a perfectly competitive situation, cross elasticity of demand is zero because a firm is producing a product that has so many identical substitutes produced by other firms. Hence if a purely competitive firm tries to raise its price, its product will be ousted by the homogeneous products of other firms.

Cross elasticity as a criterion for classification of markets is also criticised on the ground that it ignores "the two basic determinants of market structure: the degree of closeness or remoteness of substitution among products and the number of firms in the relevant group or industry."

Thus, we may conclude that cross elasticity of demand, as a criterion of market classification, is not satisfactory. The best way to classify markets is, therefore, on the basis of number of firms in the industry and the nature of the product (that is, closeness or remoteness of substitutability).

CRITERIA FOR CLASSIFICATION OF MARKETS

We have already given classification of markets. The following criteria for the classification of markets have been suggested:

(1) Substitutability of Products

This criterion refers to the existence and closeness of substitutes i.e. the extent and form of competition among the firms in the industry. This criterion may be measured by the conventional price cross-elasticity (ep) for the products of any two firms.

$$ep.\,ji = \frac{dqj}{dpi} \cdot \frac{pi}{qj}$$

This formula measures the degree to which the sales of jth firm are affected by the price charged by the ith firm in the industry. If the elasticity is high, the products of the two firms will be close substitutes. In the case of perfect substitutes (i.e. homogeneous products), the price cross-elasticity between every pair of producers approaches infinity. On the other hand, if the products are differentiated, but can be substituted for one another, the price cross-elasticity will be finite and positive. If products are not substitutes, their price cross-elasticity will tend to zero.

(2) Inter-Dependence

This refers to the extent to which firms in the industry take into account the reactions of competitors. This criterion is related to the number of firms in the industry and the degree of differentiation of the products. If the number of firms is large, no firm will take into account the actions of the rivals and each firm will act atomistically. But if there are only a few firms in the industry, they will all be alert as to what the rivals may be doing and mould their own policy accordingly.

The degree of interdependence of the firms will be measured by an unconventional quantity cross-elasticity for the products of any two firms, thus

$$eqji = \frac{dpi}{dqj} \cdot \frac{qi}{pj}$$

This formula measures the proportionate change in the price of jth firm resulting from an infinitesimally small change in the quantity produced by the ith firm. The higher the value of this elasticity the stronger the interdependence of the firms. In case the number of the firms in the industry is large, each firm will tend to ignore the reactions of the competitors whether the products are close substitutes or not. In a case like this, the quantity cross-elasticity between each pair of the producers will tend to be zero. But if the number of firms in the market is small e.g. oligopoly, there will be marked interdependence even when the products are differentiated. The quantity cross-elasticity in this case will be finite.

In the case of a monopolist both elasticities will be zero, because there is only one firm in the industry and there are no close substitutes.

(3) There is the third criterion, viz the **condition of entry** i.e. whether new firms are free to entry into the industry without let or hindrance or not.

The 'condition of entry' has been defined by the expression

$$E = \frac{Pa - Pc}{Pc}$$

Here E is the condition of entry, Pc price under pure competition and Pa price actually charged.

5. Stonier A. W. and Hague, D. C.—*A Text Book of Economic Theory*, IV Edition, p. 244.

23 | REVENUE AND REVENUE CURVES

In an earlier chapter (No. 20), we have discussed cost and cost curves. Parallel to these we have revenue and revenue curves. We explain below marginal revenue and average revenue and their inter-relationship.

MARGINAL REVENUE AND AVERAGE REVENUE

Meaning

Average revenue is the revenue per unit of the commodity sold. It is found by dividing total revenue by the number of units sold. But since different units of a commodity are sold at the same price, in the market, average revenue equals price at which the commodity is sold. Thus, **average revenue means price.** Since the consumer's demand curve is a graphic relation between price and the amount demanded, it also represents the average revenue or price at which the various amounts of a commodity are sold, because the price offered by the buyer is the revenue from seller's point of view. Therefore, **average revenue (AR) curve of the firm is really the same thing as demand curve of the consumer.**

On the other hand, **marginal revenue** at any level of firm's output is the net revenue earned by selling **another (additional) unit** of the product. Algebraically, it is the addition to the total revenue earned by selling 'n' units of product instead of n—1, where n is any given number. The word **net** in this definition is important. If the price of a product falls when more of it is offered for sale then that would involve a loss on the previous units which were sold at a higher price before and will now be sold at the reduced price along with the additional one. This loss in the previous units must be deducted from the revenue earned by the additional unit.

Suppose a firm is selling 7 units of the output at the price of Rs. 16 per unit. Now if it wants to sell 8 units instead of 7 and thereby the price of the product falls to Rs. 15 per unit, then the marginal revenue will not be equal to Rs. 15 at which the eighth unit is sold. Seven units, which were sold at the price of Rs. 16 before, will now all have to be sold at the reduced price of Rs. 15 and that will mean the loss of one rupee on each of the previous 7 units. The total loss on the previous units would be equal to Rs. 7. Therefore, this loss of 7 rupees should be deducted from the price of Rs. 15 of the eighth unit while reckoning the marginal revenue. The marginal revenue in this case, therefore, will be Rs. 15—Rs. 7 = Rs. 8 and not Rs. 15 which is the average revenue.

The marginal revenue can also be directly found by taking out the difference between the total revenues before and after selling the additional unit as follows:

Total revenue when 7 units are sold at the price of Rs. 16 = 7 × 16 = Rs. 112

Total revenue when 8 units are sold at the price of Rs. 15 = 8 × 15 = Rs. 120

Therefore, Marginal Revenue or the net revenue earned by the 8th unit = 120 − 112 = Rs. 8

Thus, Marginal Revenue of the nth unit.

= **difference in total revenue in increasing the sale from n − 1 to n units.**

Or

= **Price of nth unit minus loss in revenue of previous units resulting from price reduction.**

Generally speaking, marginal revenue is less than price as indicated by the above formula. But in perfect competition, when a firm can sell any amount at the ruling market price, marginal revenue is equal to average revenue or price since there loss incurred on the previous units.

Relationship Between AR and MR

Let us consider the relationship between marginal, average and total revenue at various level

output more fully with the help of a table given below. This tab'e represents a situation of a hypothetical firm.

TABLE
Total, Average and Marginal Revenue Schedules

Number of units sold	Price or Average revenue	Total Revenue AR× Quantity sold	Marginal Revenue (addition made to total revenue)
(1)	(2)	(3)	(4)
1	22	22	22
2	21	42	20
3	20	60	18
4	19	76	16
5	18.	90	14
6	17	102	12
7	16	112	10
8	15	120	8
9	14	126	6
10	13	130	4

In the above table, Column 2 shows the Average Revenue, while Column 4 shows the marginal revenue. Marginal revenue has been derived from the total revenue column of the table. Thus, in going from two to three units the marginal revenue is 18 and this is found out by subtracting 42 from 60, and so on. The Table further indicates that when average revenue is falling, marginal revenue is less than average revenue.

Under Perfect Competition. When competition is perfect, as already seen, the average revenue curve of the firm is a horizontal straight line. This is so because an individual firm under perfect competition, by its own action, cannot influence the price. The seller under perfect competition can·sell any amount of the commodity at the ruling market
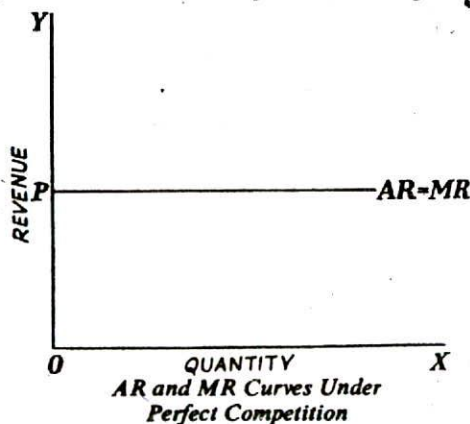

AR and MR Curves Under
Perfect Competition
Fig. 23.1

price. In this case, when average revenue curve is the horizontal line the Marginal Revenue curve coin-

cides with the Average Revenue curve. This is so because additional units are sold at the same price as before and no loss is incurred on the previous units which would have resulted if the sale of additional units would have forced the price down.

The average revenue and marginal revenue curves of a firm under perfect competition are shown in Fig. 23.1.

Under Imperfect Competition. By converting the schedules of Average Revenue given in table alongside into curves, we get two downward sloping curves and find that marginal revenue curve is below average revenue curve. This is shown in Fig. 23.2

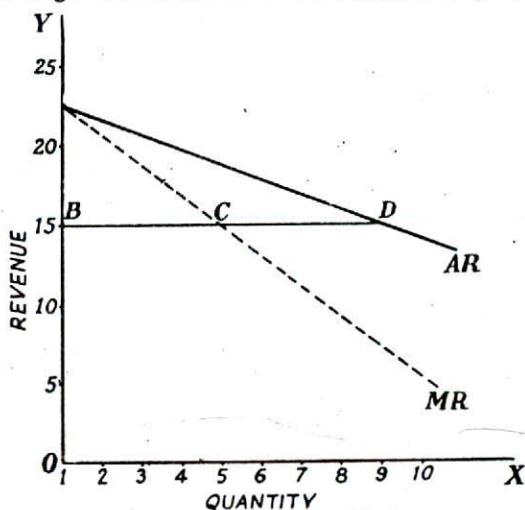AR and MR Curves Under
Imperfect Competition
Fig. 23.2

AR is the Average Revenue Curve and MR, the dotted curve, is the Marginal Revenue Curve. As we shall see in a later chapter, the divergence between the average revenue and marginal revenue as shown in the figure here is actually found when a firm is working under conditions of monopoly or imperfect competition. It is quite obvious that when price is falling as indicated by the declining AR curve, the marginal revenue must always be less than average revenue, because a falling price must mean some loss on the sale of additional supply. That is why MR curve lies below AR curve.

How much is MR below AR? We have seen above that when average revenue curve falls downward, the marginal revenue curve lies below it (or to the left of it). Now the question arises how far to the left (or below) will it lie? This will depend on the shape of the AR and MR curves: (a) They may be straight downward sloping lines; or (b) they may be convex to the origin; or (c) they may be concave to the origin.

(a) **When both the marginal revenue curve and average revenue curve are straight lines** and sloping

downwards, as shown in Fig. 23.2, the marginal revenue curve will cut in the middle of any line perpendicular to the Y-axis. That is, if from D, any point on the average revenue curve, we draw DB a perpendicular to the Y-axis, then marginal revenue curve MR must pass through the middle of this perpendicular, i.e., through C where DC = BC.

(b) However, if the average revenue curve is **convex to the origin,** as in Fig. 23.3, the marginal
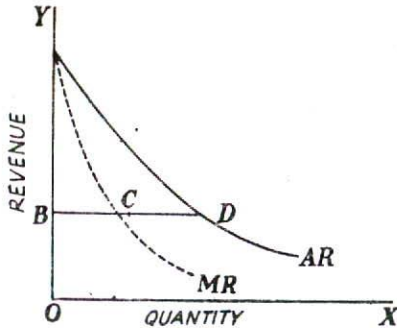

Fig. 23.3

revenue curve MR cuts any line perpendicular to the Y-axis more than half-way from the average revenue curve, i.e., DC > BC.

(c) Again, where the **average revenue curve is concave to the origin** (Fig. 23.4), the marginal
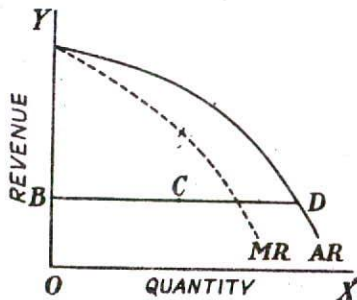

Fig. 23.4

revenue curve cuts any perpendicular line to the Y-axis less than half-way from the average revenue curve. i.e., DC < BC.

Elasticity of Demand, Average Revenue and Marginal Revenue

There is a very useful relationship between elasticity of demand, average revenue and marginal revenue at any level of output. We shall make use of this relation extensively when we come to the study of price determination under different market conditions. Let us study briefly what this relation is.

We have stressed above that the average revenue curve of a firm is really the same thing as the demand curve of consumers for the firm's product. Therefore, elasticity of demand at any point on a consumer's demand curve is the same thing as the elasticity on the given point on the firm's average revenue curve. We have already seen how elasticity of demand at any point on the demand curve is measured.[*] With this measure of point elasticity of demand, we can study the relationship between average revenue, marginal revenue and elasticity of demand at any level of output.
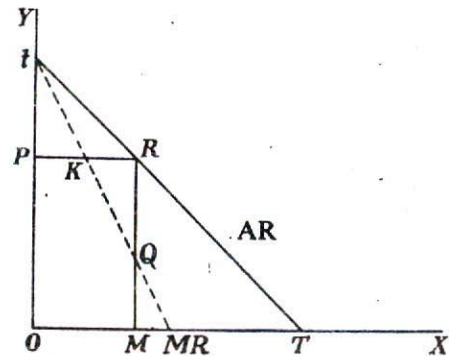
In Fig. 23.5, AR and MR respectively are the

Fig. 23.5

average and the marginal revenue curves. Elasticity of demand at point R on the average revenue curve

$$= \frac{RT}{Rt}$$

Now, in triangles PtR and MRT
$$\angle tPR = \angle RMT \text{ (right angles)}$$
$$\angle tRP = \angle RTM \text{ (corresponding angles)}$$
$$\angle PtR = \angle MRT \text{ (being the third angle)}$$
Therefore, triangles PtR and MRT are equiangular.

Hence $\quad \dfrac{RT}{Rt} = \dfrac{RM}{tP} \qquad \qquad \ldots(i)$

In the triangles PtK and KRQ
$$PK = RK$$
$$\angle PKt = \angle RKQ \text{ (vertically opposite)}$$
$$\angle tPK = \angle KRQ \text{ (right angles)}$$

Therefore, triangles PtK and RQK are congruent (i.e., equal in all respects).

Hence $\qquad \qquad Pt = RQ \qquad \qquad \ldots(ii)$

From (i) and (ii) we get

Elasticity at $R = \dfrac{RT}{Rt} = \dfrac{RM}{tP} = \dfrac{RM}{RQ}$

Now it is obvious from fig. 23.5 that
$$\frac{RM}{RQ} = \frac{RM}{RM - QM}$$

Hence, elasticity at $R = \dfrac{RM}{RM - QM}$

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[*]See Chapter 11 on the Elasticity of Demand, p. 86.

It will also be clear from the figure that RM is average revenue and QM is the marginal revenue at the output OM which corresponds to the point R on the average revenue curve. Therefore,

Elasticity at

$$R = \frac{\text{Average Revenue}}{\text{Average Revenue} - \text{Marginal Revenue}}$$

If, A stands for Average Revenue

M „ „ Marginal Revenue

e „ „ point elasticity on the average revenue curve

Then

$$e = \frac{A}{A - M}$$

If follows from this that

$$eA - eM = A$$
$$\therefore \quad eA - A = eM$$
$$\therefore \quad A(e - 1) = eM$$
$$\therefore \quad A = \frac{eM}{e - 1}$$

Hence

$$A = M \left(\frac{e}{e - 1} \right)$$

And also

$$M = A \left(\frac{e - 1}{e} \right).$$

The general rule therefore is : At any output, Average Revenue = Marginal Revenue $\times \frac{e}{e - 1}$ and

Marginal Revenue = Average Revenue $\times \frac{e - 1}{e}$,

where e stands for point elasticity of demand on the average revenue curve.

With the help of these formulae, we can find marginal revenue at any output from average revenue at the same output, provided we know the point elasticity of demand on the average revenue curve. If the demand elasticity of a firm's average revenue curve is equal to one, marginal revenue equals zero, because

$$M = A \left(\frac{e - 1}{e} \right)$$
$$= A \left(\frac{1 - 1}{1} \right)$$
$$= A \times 0$$
$$= 0.$$

Similarly, when demand elasticity on a firm's average revenue curve is 2, the marginal revenue equals half the average revenue. This is because

$$M = A \left(\frac{e - 1}{e} \right)$$
$$= A \left(\frac{2 - 1}{2} \right)$$
$$= A(\tfrac{1}{2}).$$
$$= \tfrac{1}{2} A.$$

By applying the formula for various elasticities of demand at different points (or at different levels of output) on the average revenue curve, it will be found that marginal revenue is always positive at any point or output where the elasticity of the average revenue curve is greater than one, and marginal revenue is always negative where the elasticity of the average revenue curve is less than one.

RELATIONSHIP BETWEEN AR, MR, TR AND ELASTICITY OF DEMAND

By making use of the formula given above MR = AR $\left(\frac{e-1}{e} \right)$, where MR is marginal revenue, AR is average revenue and e is elasticity of demand, we can find out the relationship between AR, MR and TR on the one hand and elasticity of demand on the other.

If the elasticity of demand e is equal to one then

$$MR = AR \left(\frac{e-1}{e} \right)$$
$$= AR \left(\frac{1-1}{1} \right) \quad = AR \times \frac{0}{1} = 0$$

Similarly, it can be shown that if e > 1, MR is positive and if e < 1, MR is negative.

This relationship can be illustrated by the following diagram (Fig. 23.6)

Fig. 23.6
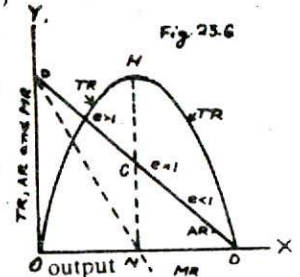
In this diagram DD is a straight line demand curve or AR curve, MR is the marginal revenue curve and OD is the total revenue curve. At the middle point C of AR curve elasticity is one (e = 1). On its lower half it is less than one (e < .) and on the upper half it is greater than one (e > 1). Referring to the formula MR = AR $\frac{(e-1)}{e}$ given above, we can say that marginal revenue corresponding to the middle point C of the demand curve (or AR curve) is zero. This is shown by the fact that MR curve cuts the X-axis at N which corresponds to the point C on the AR curve. If the quantity is greater than ON, it will correspond to that portion of the AR curve where e < 1 marginal revenue is negative because MR goes below the X-axis. Likewise for a quantity less than ON, e > 1 and the marginal revenue is positive. This means that if quantity greater than ON is sold, the total revenue (TR) will be diminishing and for a quantity less than ON the total revenue TR will be increasing. Thus the total revenue TR will be maximum at the point H where elasticity is equal to one (unit elasticity) and marginal revenue is zero.

EQUILIBRIUM OF THE FIRM AND INDUSTRY : GENERAL

EQUILIBRIUM OF THE FIRM

A firm is said to be in equilibrium when it has no incentive either to expand or to contract its output. A firm would not like to change its level of output only when its total profits are the maximum. A rational entrepreneur will expand output if he thinks he can increase his total profits by doing so, and likewise, he will contract his output if he thinks he can avoid losses and thus increase his total profits. Therefore, **a firm is in equilibrium position when it is earning maximum money profits.**

Conditions of Firm's Equilibrium

Having studied marginal revenue and average revenue in the previous chapter, we are now in a position to discuss the conditions of equilibrium of the firm. Here, we shall attempt only an analysis of the conditions of firm's equilibrium in general and not with reference to any particular market form. The firm's equilibrium conditions with particular reference to different market forms, *i.e.*, under perfect competition, monopoly and imperfect competition, will be discussed in later chapters.

, **Assumptions.** Before explaining firm's equilibrium, we assume that the entrepreneur, *i.e.*, the owner of the firm, is rational. The rationality on the part of the entrepreneur implies that he tries to maximize his money profits. This is a fundamental assumption in the theory of production and without this, the equilibrium of the firm cannot be easily explained. A corollary from the assumption of rationality is that whatever output the firm produces, it produces as cheaply as possible given the existing production techniques. We further assume, for the sake of simplicity, that the firm produces only one product. Our analysis would, however, remain valid also in case of multiple-product firm. But when a firm produces two goods or more, certain other complications arise which we wish to avoid at this stage.

The equilibrium of the firm can be explained in two ways:

- (i) With the help of total revenue and total cost curves, and
- (ii) With the aid of marginal revenue and marginal cost curves.

Equilibrium of Firm: By Curves of Total Revenue and Total Cost

A rational entrepreneur will expand output if he thinks he can increase his profits by doing so and he will likewise contract output if thereby he can avoid losses and thus increase profits. He will be in equilibrium position at the level of output where his money profits are the maximum. In other words, he will then have no inducement either to expand or contract his output when he is earning maximum money profits. Now, profits are the difference between total revenue and total cost. Hence, the point where this difference is the maximum will represent the position of maximum profits and, therefore, of equilibrium.

A cost-revenue situation of a hypothetical firm is depicted in Fig. 24.1 where TC represents total cost curve and TR represents the total revenue curve. It will be noted that total cost curve TC starts not at the origin but at the height of OF. This is so because it is assumed that even if the firm produces nothing (or shuts down), it has to bear certain costs of production due to fixed factors. These are the fixed costs.

Break-even Point. From the figure, it is clear that at any output smaller than OL, total cost exceeds total revenue and the firm is having losses. At the output OL total cost equals total revenue and the firm is having neither losses nor profits. This point L is called **'Break-even point'.** At the outputs larger than ON, the total revenue is less than total cost so that the firm is having losses. Point N is again a

break -even point. Between OL and ON will lie the optimum point of maximum profits.
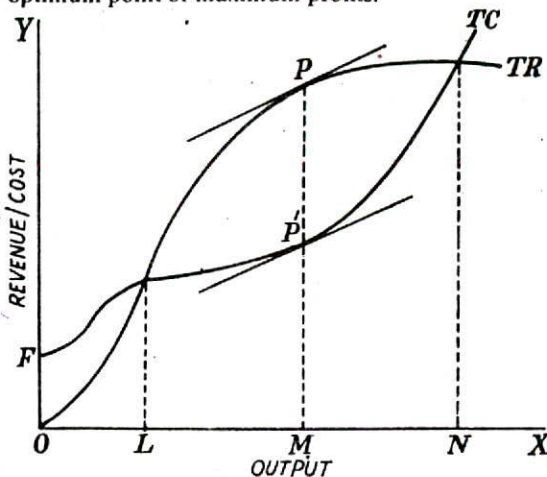
Equilibrium of Firm:
Total Revenue and Total Cost
Fig. 24.1

The maximum-profit will lie where revenue-cost spread is the largest or in other words where the vertical distance between the total revenue and total cost curves is the greatest. The maximum profit point in our diagram is M where PP′ is the longest vertical distance between the two curves. Hence, at this point, the firm is in equilibrium position and is earning maximum profits PP′ by producing OM output. The maximum profit point will in fact be at that output where the slopes of the two curves are the same, that is to say, where the tangents to the total cost and total revenue curves respectively are parallel as is shown in Fig. 24.1 above.

Limitations. This way of finding out the point of maximum profits by total revenue and total cost curves is reasonable and is also often used by businessmen but it has some limitations:

First, maximum vertical distance between the total revenue and total cost curve is difficult to see at a glance. Many tangents have to be drawn before one reaches the appropriate one corresponding to the maximum profit point. Secondly, in this method, it is not possible to discover price per unit at various outputs at first sight. Total revenue has to be divided by total number of units produced in order to get the price per unit. For example, at the equilibrium output OM, the price can be found by dividing MP by OM.

Owing to these limitations, complicated problems of equilibrium analysis cannot be discussed easily and clearly in this way of representing equilibrium of the firm. Modern economists, therefore, adopt a method which shows marginal quantities, *i.e.,* marginal cost and marginal revenue at first sight.

Now we turn to this second way of representing equilibrium of the firm.

EQUILIBRIUM OF FIRM: BY CURVES OF MARGINAL REVENUE AND MARGINAL COST

We know that a firm will be in equilibrium when it is earning maximum profits. We shall presently that for a firm, to make maximum profits, two conditions are essential:
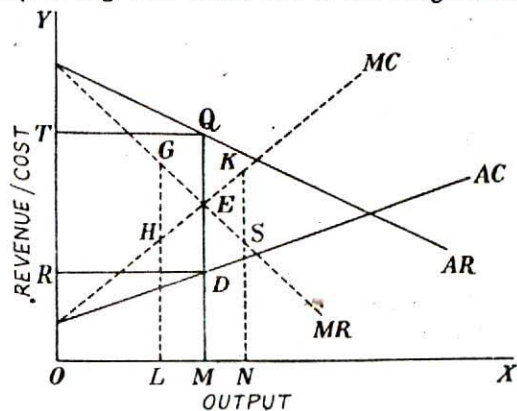
(i) Marginal Revenue = Marginal Cost, and
(ii) MC curve cuts MR curve from below at the equilibrium point.

It is obvious that total profits can be increased by expanding output as long as the addition to the total revenue resulting from the sale of extra unit of output is greater than the addition to the total cost caused by producing an extra output. Now the addition to total revenue and total cost due to an extra unit of output are nothing else but marginal revenue and marginal cost respectively.

Thus, a firm will go on expanding output as long as marginal revenue exceeds marginal cost of production. If, at any output, marginal revenue falls short of marginal cost, *i.e.,* if an additional unit of output adds less to total revenue than to total cost, the firm will contract output to avoid losses and thus increase its profits. **The level of output where marginal revenue and marginal cost are equal is the point of maximum profit.**

Before this point of equality of marginal revenue with marginal cost is reached, the firm will be increasing its total profits by producing more as it is adding more to the total revenue than to the total cost. But if production is carried beyond this point of equality, the profits will start decreasing as the extra revenue will be smaller than the extra cost of production of a unit of output.

The whole argument can be explained with the help of Fig. 24.2 where MC is the marginal cost

Equilibrium of Firm:
MR and MC
Fig. 24.2

curve and MR the marginal revenue curve. AC and AR are the average cost and average revenue curves

respectively At the output OM, marginal cost equals marginal revenue (MR and MC curves intersect at E above this point). This represents the point of maximum profits and hence of equilibrium.

At outputs smaller than OM, marginal revenue exceeds marginal cost and hence there is scope for increasing profits by increasing output. For example, at output OL, marginal revenue is LG and the marginal cost is LH, and LG is greater than LH. It means that by producing the Lth unit, the firm is adding more to revenue than to its cost and, therefore, it will be profitable for it to produce the Lth unit.

Similarly, for every other unit till the Mth one, the marginal revenue exceeds marginal cost, and, there-fore, the firm can increase its total profits by producing up to OM output. If the firm stops producing at OL, the units of output which could have added more money to the firm's revenue than to its cost would not have been produced and profits would have been smaller by the area GHE than they could have been. Thus, a firm has an incentive to produce up to OM level of output.

But if the output is increased beyond OM, mar-ginal cost would exceed marginal revenue and the production of each additional unit beyond OM output would add more to total cost than to total revenue. For example, at ON output, the marginal cost is KN whereas the marginal revenue is SN and KN is greater than SN. Thus, production of more units than OM would involve losses, and reduce the total profits. Therefore, the firm would not like to produce beyond OM.

Hence, we conclude that firm's profits at OM output are the maximum and **the firm is in equili-brium when**

Marginal Cost = Marginal Revenue.

This is one condition which is necessary but which is not sufficient for equilibrium.

In the Fig. 24.2, the total profits earned by the firm in the equilibrium position can be easily found. At output OM, the average cost is DM while the average revenue is QM. Therefore, the profit per unit will be equal to QD and the total profits will be equal to the rectangle QDRT.

At an equilibrium position, the **marginal cost curve must cut the marginal revenue curve from below.** The condition that for a firm to be in equilibrium marginal cost must equal marginal revenue is no doubt a necessary condition but not a sufficient condition of equilibrium. For attaining equilibrium, a second condition must also be satisfied, viz., that the marginal cost (MC) curve must cut the marginal revenue (MR) curve from below at the point of equilibrium. This means that, beyond the equilibrium output, marginal cost must be greater than marginal revenue. If this condition is not met, a firm will not be earning maximum profits

and hence will not be in equilibrium, as we shall see in the diagram below:

In our Fig. 24.2, the point E (i.e., output OM) satisfies this second condition also, as the MC curve cuts the MR curve from below at E and MC is greater than MR beyond E. It will be clearly not profitable, therefore, to expand output beyond OM. But there can be such a cost-revenue stituation, which satisfies the first condition of MC being equal to MR but the second condition of MC cutting MR curve from below is not met.

In Fig. 24.3, MR is the straight line marginal
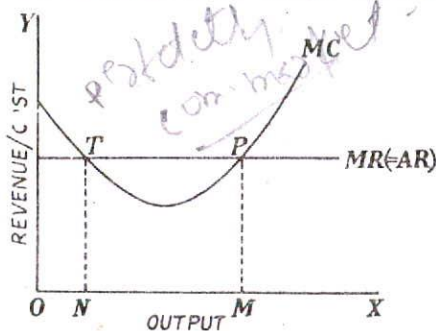
MC Cutting MR from Below
Fig. 24.3

revenue curve (as we have already seen, a straight line marginal revenue curve is actually faced by a firm under perfect competition). MC is the marginal cost of the firm. At point T where MC and MR intersect, the marginal cost equals marginal revenue but from the figure it is clear that at T, marginal cost curve MC is cutting marginal revenue curve MR from above and, therefore, marginal cost is less than the marginal revenue beyond the point T. Obvious-ly, T cannot be a position of equilibrium since after T, marginal cost is less than marginal revenue and it will be profitable for the firm to expand output. At T or output ON, the firm instead of making maximum profit is making maximum losses. At point P in the same figure, however, marginal cost curve is cutting marginal revenue curve from below and marginal cost beyond the point P is greater than marginal revenue. Hence, if the firm expands output beyond P (i.e., OM output), it will be adding more to cost than to revenue—clearly an unprofitable move. Thus, we conclude that in this figure, the point P, and not point T is the profit maximising point. In this equilibrium position, the firm is producing equilibrium output OM.

Similarly, point E in the Fig. 24.4 (a) cannot be a position of equilibrium though MC equals MR at this point. This is because at E marginal cost curve is cutting the marginal revenue curve from above rather than from below. Though at point E, both MC and MR curves are falling downwards, yet MC is falling more steeply than MR. Therefore, beyond
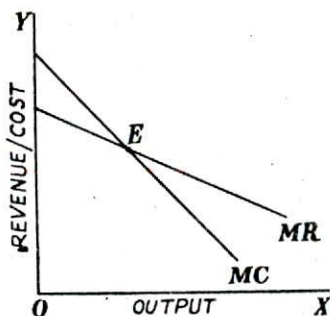
Fig. 24.4 (a)

Equilibrium when both MC and MR are Falling

Fig. 24.4 (b)

E, MR is greater than MC. Hence, it will be profitable for the firm to expand output. Hence, E cannot be the position of firm's equilibrium. For the firm to be in equilibrium, in Fig. 24.4 (a) MC beyond E must rise upwards to cut the MR curve from below. If it does not rise upwards beyond E, then there can be no definite position of equilibrium in cost-revenue situation presented in Fig. 24.4 (a).

It should be carefully noted that point S in Fig. 24.4 (b) is really a position of equilibrium under the given cost-revenue situation. At S, MC equals MR and also MC curve is cutting MR curve from below. Although at S both MC and MR are falling downwards, yet MC is falling less rapidly than MR and, therefore, beyond S, MC is greater than MR. It will be unprofitable to expand output beyond S; nor will the firm move to the left of S, since it can increase its total profits by producing until S.

Two Conditions. Thus, we repeat that for a firm to be in equilibrium position, two conditions must be satisfied;

(i) **MC = MR**; and
(ii) **MC curve must cut MR curve from below at the equilibrium output.**

These two conditions of equilibrium hold good both in the short run as well as in the long run. Whether the period is short or long, a firm aims at maximisation of profits and the profits are maximised only when the above two conditions are satisfied. But there is one difference. In the short run, it is the short-run marginal cost curve and in the long run, it is the long-run marginal cost curve which is relevant for comparing with the marginal revenue curve.

Again, these two fundamental conditions, viz., marginal cost being equal to marginal revenue and MC curve cutting MR curve from below, are valid whether a firm is working under perfect competition, monopoly or imperfect competition. The difference lies only in the shape of the marginal revenue and marginal cost curves. Under perfect competition, MR and AR curves are horizontal
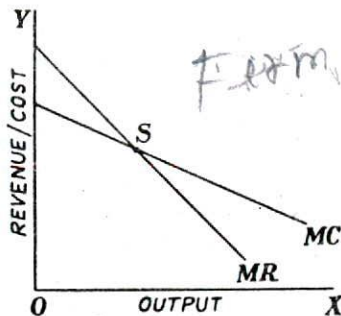
straight lines and they coincide, but under imperfect competition MR and AR curves are downward sloping as in Figure 23.2 and 23.3 in Chapter 23 respectively.

EQUILIBRIUM OF INDUSTRY

Meaning. An industry is said to be in equilibrium when there is no tendency for it to increase or decrease its output. Now, it will have no tendency to expand or contract its output only when the demand for and supply of its product are in equilibrium. If, for instance, the demand for its product exceeds the supply, the output is bound to increase. On the other hand, if the supply is greater than the demand for its product, the supply will have to be contracted to restore the equilibrium between demand and supply. Hence, equality between demand and supply for the product of industry is very essential if the industry is to be in equilibrium.

We know that the equilibrium of the firm does not determine the price under perfect competition. A firm operating under perfect competition has to accept the price prevailing in the market. But it is the equilibrium of the industry as a whole that determines the price under perfect competition. This means that there must be an equilibrium between demand for the product of the industry and the supply of that product by the industry. Hence we may say that industry is in equilibrium at the level of output at which the quantity demanded and the quantity supplied of its product are equal, *i.e.*, at which the demand curve for the product of industry and its supply curve intersect each other.

CONDITIONS OF EQUILIBRIUM

We have said above that an industry is said to be in equilibrium when there is no tendency for its output to increase or decrease. Now the output of the industry can vary (a) by the expansion or contraction of output by the individual firms and (b) by the entry or exit of the firms. Thus, an industry would be in equilibrium when neither the individual firms have incentive to change their output nor is

there any tendency for the new firms to enter or the existing firms to leave it.

Thus, besides equality between demand and supply of industry's products, two conditions must be satisfied if there is to be the equilibrium of the industry:

(a) Each and every firm should be in equilibrium. This will happen, as already explained, at the output where marginal cost is equal to marginal revenue and marginal cost curve cuts the marginal revenue curve from below at the equilibrium point.

(b) Industry as a whole should be in equilibrium, i.e., there should be no tendency for the firms either to move into or out of the industry. This will happen when all the entrepreneurs, i.e., owners of the firms in the industry, are earning only 'normal profits', that is, profits which are just sufficient to induce them to stay in the industry, and when no entrepreneur outside the industry thinks that he could earn at least normal profits if he were to enter it.

Thus, the concept of normal profits is important in defining and describing equilibrium of the industry. If we assume that all the entrepreneurs in a certain industry have the same transfer earnings, there would be a fixed amount of normal profits for the whole industry. Every entrepreneur must earn at least this fixed amount of normal profits, if he is to stay in the industry.

If firms in the industry are earning profits above the normal, there will be incentive for the firms outside the industry to enter it. This is so because there is every reason for the entrepreneurs outside the industry to expect that they would be able to earn at least normal profits if they entered this industry. Thus, there will be a tendency for the number of firms in that industry to increase.

If, on the other hand, some of the firms in the industry are earning profits below normal (or when they are having losses), they will leave the industry and search for normal profits elsewhere. Thus, the number of firms in that industry will tend to diminish.

Thus, equilibrium of the industry or **full equilibrium**, as it is sometimes called, would be attained when industry as a whole is in equilibrium (i.e., there is no movement into or out of the industry) and also all the individual firms in it are in equilibrium, i.e., they are equating marginal cost with marginal revenue, and their MC curves cut MR curves from below.

Short-run and Long-run Equilibrium. We might distinguish between the short-run and the long-run equilibrium of an industry. We have said that the industry is in equilibrium when all the firms comprising the industry are making normal profits. But this is a long-run view. In the short run, it may be that the firms are making supernormal profits. In that case, new firms will enter the industry to take

advantage of this favourable situation. On the other hand, it may be that the circumstances are so unfavourable that the firms in the industry are incurring losses. In that case, some firms will tend to leave the industry. In both these cases, the industry cannot be said to be in equilibrium. Since in the short run, by definition, the entry or exit of the firms is ruled out, the condition of making only normal profits by the existing firms in the case of short-run equilibrium is not required. Hence we can say that the industry is in short-term equilibrium (a) when the short-run demand for and the supply of the industry's product are equal and (b) when all the firms in it are in equilibrium, even though they may be making super-normal profits or having losses depending upon the demand conditions of the industry's product.

In the long run, exit or entry of the new firms is possible. Hence only normal profits will be made by the firms. Super-normal profits will be competed away by the entry of the new firms and, if there are losses, they would be eliminated by the exit of some of the existing firms. Thus, an industry will be in equilibrium in the long run if the following two conditions are satisfied beside the equality between the long-run supply and the demand for the industry's product: (a) all the firms in the industry should be in equilibrium and (b) there should be no incentive to entry into the industry by the new firms or compulsion for the existing firms to leave it. In other words, the number of firms should be in equilibrium.

Incorporating Normal Profit into Average Cost Curve

A firm's decision to stay or leave the industry will depend not only on whether it is covering average total cost as it is generally defined but also on whether it is earning at least normal profits. It is, therefore, useful to include normal profits in average cost. This inclusion of normal profits in average cost helps us to judge easily whether firms have a tendency to stay or leave the industry. If we do not include normal profits in the average cost, we shall have to compare the current level of earnings with normal profits which is an unnecessary complication.

If price is equal to average cost including normal profit of all the firms, it means that all the firms are making just normal profits besides covering average cost of production. We can then easily conclude that industry is in equilibrium as in this situation the firms would have no tendency either to enter or leave the industry.

If the price is greater than average cost including normal profits, it means that existing firms are making super-normal profits. This will induce new firms to move into the industry. This movement will

continue until the super-normal profits are competed away.

On the other hand, if the price is less than the average cost including normal profits, it follows that firms are making sub-normal profits, *i.e.*, having losses; therefore, some firms will be forced to quit the industry until the existing firms are at least covering average cost including normal profits.

In Fig. 24.5, we have drawn a curve ACP which
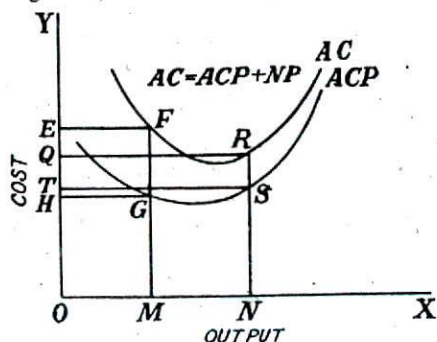
Incorporating Normal Profits into A C
Fig. 24.5

represents average cost of production and does not include normal profits. If in ACP we add normal profits, we get AC curve which is the summation of the average cost of production and normal profits calculated per unit. The normal profits per unit will fall progressively as output increases. This is because a fixed sum of total normal profits will be spread over a progressively large number of units of output. Consequently, the vertical distance between ACP and AC=(ACP+NP) curve will steadily fall but the two curves will never meet. For instance, at the output level OM, the normal profit per unit is FG, and at output ON, the normal profit per unit is RS. It should be carefully noted that rectangles showing normal profits such as EFGH and QRST would be of equal areas as we are assuming that normal profits represent a fixed sum of money.

As already pointed out, it is reasonable to assume that there will be a fixed amount of normal profits in an industry. This **normal profit, is a fixed amount, (*i.e* independent of the level of output) which the firms must earn if they are to remain in the industry.** As the normal profits represent a fixed sum of money, it means that as output increases normal profits calculated per unit of output will fall as a fixed sum will be spread over a large number of units of output. This will be an additional reason for the average cost curve to slope downward over the low ranges of output.

VALIDITY OF PROFIT-MAXIMISING DOCTRINE

We have seen in the analysis of a firm's equili

brium, that a producer is not interested in reducing either his average cost or total cost to the minimum or in maximising his revenue. What he is interested really is in the difference between his total cost including normal profit and total revenue which is his profit. It is said that he wants to make this difference as big as possible In other words, a firm seeks to maximise its profits. But is this assumption valid ?

But let us be clear as to what we mean by profit maximisation. The normal profits are minimum income which the entrepreneur must get if he is to stay in business. The normal profits are included in the cost and, therefore, do not come under the profit maximizing principle. Therefore, it is the super-normal profits, *i.e.*, true or pure profits, which is the residual income of the entrepreneur, which he aims at maximizing.

There has been lot of controversy over this issue. There are economists who doggedly stick to this assumption and strongly assert that a firm exists and operates for no other purpose than to maximise profits. But there are others who question the validity of maximising doctrine.

Meaning of Profit

We usually define profit in Economics as a reward for enterprise or for risk-taking or uncertainty-bearing. But this definition does not lend itself to any quantitative interpretation to enable us to settle the issue.

There are two technical difficulties in interpreting the concept of profit maximisation: First difficulty relates to the time dimension. A businessman is said to maximise his profit for each accounting period, say a year. But this is not a good assumption, when dealing with a continuing business. Because a business can certainly increase its profits in a particular year by utterly neglecting the future, *e.g.*, clearing all the stock of finished goods at the end of the period.

The economist, therefore, as distinguished from the businessman, lays emphasis on the future in the concept of profits. According to this interpretation, profits may be defined as the maximum dividend that a company can pay without impairing its ability to pay the same dividend in subsequent years.

The second difficulty about the concept of profits relates to the criterion for evaluating risk for which profit is a reward.

Leaving aside the dispute regarding the interpretation of the term 'profits', let us try to see whether the doctrine of profit maximisation is a mere theory to be found only in text-books on Economics or whether the firms do actually try to maximise profits.

Arguments For

The following arguments are put forward to show that the assumption of profit maximisation is amply borne out by business behaviour:—

(i) The businessmen sometimes assert that it is their business to look after social welfare, rather than personal gain.

Thus the actual behaviour of businessmen is in accord with profit maximisation doctrine.

(ii) The postulate of profit maximisation certainly applies to industries and it is the behaviour of the industry, rather than of an individual firm which determines the flow of products and the demand for inputs.

Arguments Against

Those who question the validity of the profit-maximisation postulate put forward the following arguments:—

(i) Enlightened businessmen vehemently deny that their object is to maximise profits. Service of society rather than personal profit is said to be their aim.

(ii) The profit-maximisation doctrine would be the rule, if business decisions were taken by those who are to get the profits. Most business decisions are taken by business executives or salaried managers, rather than by owners of firms.

(iii) The objective of profit maximisation is difficult of realisation. If a businessman is to maximise his profits, he must fix a price, so as to equalise marginal revenue and marginal cost. This means that he must be able to estimate demand at all prices and marginal cost at all outputs. This is a fantastically difficult task and is seldom attempted in practice.

(iv) Besides being difficult of precise calculation, profit maximisation is also regarded as immoral. "Profit maximisation requires the businessman to use every trick he can think of to keep wages and fringe benefits down, to extract the last possible dollar from the consumer, to sell as low quality merchandise as he can legally hoodwink the customer into buying, to use income solely for the benefits of the stock holder, to disclaim any responsibility to the community, to wrangle the lowest possible price from his vendors regardless of its effect on them, and so on."[1]

(v) The business policies and practices actually pursued by businessmen are not consistent with the profit maximisation doctrine. The calculus of maximisation does not fit the notions which actually sway businessmen. They are guided by a sense of fairness, adequacy, etc. They are satisfied with a satisfactory rate of profit instead of pursuing maximum profits with callous disregard for other interests.

Conclusion

Thus, profit maximisation maxim is unrealistic since it is difficult of calculation and not very ethical to pursue. Marginal analysis as a tool of profit maximisation is a valid technique for selecting the most efficient technique out of the various alternatives available, where the alternatives can be fairly clearly specified and where it is possible to estimate costs and revenue reasonably well. But this is not always possible.

We may conclude in the words of Robert Dorfman thus: "On balance, the maximisation hypothesis is not as firmly grounded in the facts of life as a fundamental scientific hypothesis should be. But substantial and prolonged divergences from the behaviour it implies are rare, particularly in industries with many participants. It, therefore, can still be entertained as a sound working hypothesis."[2]

Full Cost Pricing Principle

For many years, Chamberlin's and Joan Robinson's price theory of monopolistic competition had come to be generally accepted. According to this theory, the firms were able to act atomistically on the principle of profit maximisation without fear of rivals' reactions. They fixed prices so as to maximise their profits and this they did by equating marginal cost to marginal revenue (MC=MR). But empirical studies made by Oxford economiests under the leadership of professors Hall and Hitch (*Price Theory and Business Behaviour*) showed that the firms did not use the *marginalist rule* (MC=MR) and that oligopoly was the main market structure in the business world. According to Hall and Hitch, the firms did not act atomistically or irrespective of what their rival firms did. Rather they are continuously watching the reactions of the rival firms. The traditional theory could not adequately explain the oligopolistic inter-dependence.

In such a situation, the firms do not attempt to maximise short-run profits by acting on the marginalistic rule (MC=MR) but aim at maximising long-run profits by acting on the *average-cost principle*. That is, the firms do not set their price and output at the inter-section of MC and MR curves but they set them at a level which covers the average variable cost, (AVC) and average fixed cost (AFC) and normal profit margin in the business in ques-

1. Hailstones, Thomas J.—*Readings in Economics,* 1963, pp. 113-114.

2. Dorfman R.—*The Price System,* 1965, p. 42.

tion. Thus P = AVC + AFC + Normal Profit. Firms do not seek abnormal profits for fear of losing business to rivals, actual or potential. Hall and Hitch found that the firms are ignorant not only of their demand curves but also of their marginal cost, especially in multi-product firms. Rather they follow the full cost principle which gives them a 'fair profit' and cover the full cost of production. Hall and Hitch found that the firms' main concern is with price and not output as the traditional theory implies.

Profit Maximisation and single owner-Entrepreneur

We have examined above one assumption underlying the traditional theory of the equilibrium of the firm, viz. profit maximisation through the marginalist principle (*i.e.* equating marginal cost with marginal revenue). We have shown that, according to Hall and Hitch, it is the fall cost principle rather than the marginal principle which is found to operate in the business world. The traditional theory also assumes that the firm on which profit is sought to be maximised is owned by a single owner-entrepreneur whose sole concern is to maximise profit. In modern business world, however, single entrepreneur is an exception rather than the rule. It is the professional manager who actually controls the business because the dominating form of business organisation today is a joint stock company. There is thus a divorce between ownership and management. The single owner-entrepreneur was supposed to act with 'global rationality' and there were no time, information or other constraints restraining him from pursuing the single aim of profit maximisation.

Obviously this assumption is unrealistic, because actually it is the manager who has the decision-making power. He may as well pursue goals other than profit-maximisation, *e.g.* social welfare, employees' welfare, stability and growth. The salaried manager also lacks the motivation that a single owner-entrepreneur has for maximising profit.

Conclusion

The fact is that given the uncertainty in and complexity of the modern business world, lack of full and accurate information, the limited time and limited activity of the manager/entrepreneur and other constraints, the firms do not seek the maximisation of profits, sales, growth or anything else. They at best try to exhibit satisfactory behaviour i.e. satisfactory profit, satisfactory sales, satisfactory growth, *etc.* This is known as 'Behaviourism'.

GOALS OTHER THAN PROFIT-MAXIMIZATION

We have discussed above the profit maximization principle. It gives the impression that every businessman aims at maximizing his profits regardless of all other considerations. This, however, is not so. On the other hand, in the world of reality, businessmen pursue several other goals in running their business. Among these we may mention **Security Motive, Sales Maximization Motive or Utility Maximization Motive.** We shall say a word about each.

Security Motive

It is said that when an entrepreneur fixes the price for his product, his aim is not to get maximum possible profit, but to satisfy his sense of security. In other words, he aims at getting a good income for many years to come so that he does not suffer from any sense of insecurity. This means that the entrepreneur's objective is to secure a steady flow of profit for a long time. Professor K.W. Rothschild observes in this connection, "Profit maximization has uptill now served as the wonderful master-key that opened all the doors leading to an understanding of the entrepreneur's behaviour . . . . . But there is another motive which cannot be so lightly dismissed and which is probably of a similar order of magnitude as the desire for maximum profits; the desire for secure profits."[3]

If we take the market structure into consideration, we might say that so far as imperfect competition and monopolistic competition with a large number of firms or absolute monopoly are concerned, profit maximization seems to be a valid assumption. In the case of perfect competition, a firm has to accept the prevailing price and has no option, therefore, the question of profit maximization does not arise. In the case of monopolistic competition and absolute monopoly, the entrepreneurs are in a position to fix their price and maximize their profits. But in the case of oligopoly, profit maximization cannot be considered a valid assumption. The oligopolist has both the desire and the power to achieve a secure position. In such a market situation, therefore, the desire for security rather than the desire for maximum profit rules the entrepreneur's mind.

Sales Maximization

The sales maximization hypothesis has been put forward by Professor Baumol. In his view, maximization of sales rather than the maximization of profit is the ultimate objective that the entrepreneur pursues. He says that sales have become an end of themselves and not merely as a means to further other objectives like operational efficiency and profits. Baumol, therefore, regards sales maximization as the most valid assumption governing the behaviour of a firm. By sales is meant the revenue earned by selling the product. Therefore, it is also called **Revenue Maximization Hypothesis.**

However, Prof. Baumol concedes that while

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3. Rotheschild K. W., Price Theory and Oligopoly The Economic Journal Vol. LVII 1974, p. 229 to 230, reprinted in *Readings in Price Theory* (AEA).

promoting sales businessmen do not ignore altogether the goal of profits. He, therefore, modifies his position by saying that the entrepreneur promotes sales subject to the limitation that costs incurred are covered and a usual rate of return on investment is secured. Hence, according to Prof. Baumol, the objective is the sales maximization subject to minimum profit constraint. He says "So long as profits are high enough to keep stock holders satisfied and contribute adequately to the financing of company's growth, management will bend its efforts to the augmentation of sales revenue rather than to further increase in profits." [4]

The following diagram (Fig. 24.6) illustrates how, a firm aims at maximum revenue or sales consistent with earning minimum profit. This model is a compromise between total sales and profits. But it is also understood that after MR = MC, increase in sales can only be at the expense of profits. This puts a limit to sales increase because minimum profits must be made.

Fig. 24.6
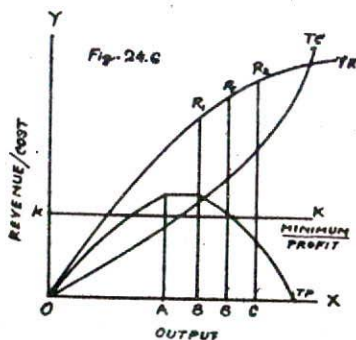
Here TR is total revenue, TC total cost and TP curve represents total profit. At the output OA, profits are maximum. But if the firm aims at only sales maximisation, output will be OC which corresponds to R_2 at the top of TR giving maximum total revenue. But actually this firm will produce and sell OB corresponding to R_1 total revenue because it gives minimum profit.

Utility Maximization

There are economists like Benjamin Higgins, Melvin Redder and Tibor Scitovsky who say that maximization of satisfaction or utility is the overriding consideration which governs businessman's behaviour. This goal is also called **Preference Function Maximization.** These economists point out that profit maximization does not necessarily result in maximization of satisfaction. In their view, we should not only consider the satisfaction that an entrepreneur gets from his material possessions

which he may get from his profits, but also the satisfaction which he may get from the leisure that he is able to enjoy. The entrepreneur's attitude towards work and leisure is a very important consideration if the entrepreneur is to maximize his utility or satisfaction. According to this view, an entrepreneur would try to reach the highest possible indifference curve in order to derive the maximum possible satisfaction and this will happen where his net profits curve is tangent to indifference curve.

We may, however, add that to assume entrepreneur's willingness to work as independent of his income seems to be an unrealistic assumption. Generally, it is the income motive which is a more powerful motive that sways the businessman's behaviour. But as Scitovsky has pointed out "The assumption that the entrepreneur's willingness to work is independent of his income need not imply that he is not interested in the material rewards of his work. It may also mean that he is so keen on making money that his ambition cannot be damped by a rise in income . . . . . This is likely to be the case partly because the desire for success is more insatiable than the demand for the material goods and partly because it is not a high but a rising income that is a sign of business success. [5] This means that it is success in business which gives greater satisfaction to the businessman **than** the money that the business brings.

According to Professor Benjamen Higgins, an entrepreneur tries to maximize his satisfaction or what he calls utility index rather than profits. He says that profit maximization is a condition of survival in perfect competition. But profit maximization motive is much weaker under the conditions of imperfect competition. There are three types of desires which in Higgins' opinion lead to non-profit maximization: (a) Desires and forces which lead the entrepreneur to produce at a point below the profit maximization motive, e.g., desire for leisure; (b) forces which lead the entrepreneur to produce at a point above the profit maximization output, e.g., desire to wield more power and enjoy greater prestige; and (c) forces which make the entrepreneur stay where he is irrespective of the profit maximizing output. This may be due to his reluctance to make experiments.

Conclusion

We may, therefore, conclude by saying that there is not only one goal which the businessmen pursue, but there are several goals which they keep before them while running their business. Much depends upon the psychology of the businessman and the market environment in which he operates.

4. Baumol. W. I.—*Business Behaviour, Value and Growth*, pp. 49–50.

5. Scitovsky, T. A. Note on Profit Maximization and Implications. *The Review of Economic Studies.* Vol. XI (1943), Reprinted in *Readings in Price Theory* (AEA).

25 EQUILIBRIUM OF FIRM AND INDUSTRY UNDER PERFECT COMPETITION

Conditions of Perfect Competition: Their Implications

In the previous chapter, we have discussed in detail the conditions of equilibrium of a firm and industry. As mentioned earlier, our analysis in regard to the equilibrium in the last chapter was only in general terms and not with reference to any particular market form. Now in the present chapter, we shall discuss the conditions of equilibrium of the firm and industry under conditions of perfect competition.

In chapter 22, the meaning and conditions of perfect competition have already been studied. Perfect competition, as explained there, refers to a situation when:

(i) Number of sellers and buyers is very large;

(ii) Products are homogeneous;

(iii) Both producers (or firms) and consumers possess perfect knowledge about the prevailing price and current bids in the market; and

(iv) Entry into and the exit from the industry is free for the firms.

The first condition ensures that an individual firm and an individual consumer (or buyer) have no control over the price of the product. There being a large number of firms in the industry, the output of an individual firm is an insignificant part of the total output of the whole industry. An individual firm produces such a small proportion of the total output of the industry that even a large increase or decrease in its output has little or negligible effect on the total output and hence on the price of the product of that industry. Therefore, an individual firm has to take the price as given.

Similarly, the buyers or consumers of the product are also numerous and a single buyer's demand for the product is so small that changes in it cannot have any perceptible effect on the total demand and hence on the price of the product of that industry.

Thus, under perfect competition, an individual firm or individual buyer acts as if he had no influence on price and merely adjusts to a given market price.

The second condition ensures that all firms are producing goods which are accepted by consumers or buyers as homogeneous or identical. It means that product of one firm is indistinguishable from the products of other firms in the industry. Trade marks, patents, special brand labels, *etc.*, do not exist. The control over price is completely eliminated only when all firms are producing perfectly homogeneous goods, since if the product of any one firm is slightly different from that of others, it would have a degree of control over the price of his own brand. Thus, if there is to be no control over the price of the product by any one producer, the products must be homogeneous.

It should be carefully noted that whether or not products are homogeneous should be judged from the viewpoint of the consumers. If the consumers (or buyers) find some imaginary differences between the products, their prices are bound to differ, however, physically alike the products may be. Anything which makes the buyers prefer one seller to another, be it personality, reputation, convenient location, or the tone of his shop, differentiates the product purchased to that extent, since what is bought is really a bundle of utilities of which these things are a part. The utilities offered by all sellers to all buyers must be identical, otherwise individual sellers will have a degree of control over their individual prices. "Under such condition it is evident that buyers and sellers will be paired in random fashion in a large number of transactions. It will be entirely a matter of chance from which seller a particular buyer makes his purchases, and purchases over a period of time will be distributed among all sellers according

to the law of probability. After all, this is only another way of saying that the product is homogeneous." [1]

The third condition guarantees that buyers and sellers are fully aware of the prevailing price in the market. Since there are no uninformed buyers, sellers cannot attempt to charge more than the prevailing price. Consumers cannot hope to buy from some producers at less than the prevailing price for similar reasons. If any seller tries to charge a higher price than the prevailing market price, the buyers will shift to some other seller and buy the commodity at the ruling price, since they are supposed to know the prevailing market price. The consumers will refuse to buy the commodity at the higher price.

The above three conditions ensure that a single price must prevail in the market under perfect competition and, further, that the demand curve or average revenue curve faced by an individual firm under perfect competition is perfectly elastic at the prevailing market price.

The fourth condition ensures that there must not be any restriction on the entry of new firms or the exit of the existing firms. As we have pointed out previously, in the short run, the firms can neither change the size of their plants nor can the firms enter or leave the industry. But, in the long run, both the size of the firm as well as the number of the firms can vary. The fourth condition of perfect competition requires that there must be absolute freedom for the entry or exit of the firms, in the long run. If the prevailing price in the market is such that all the firms are making super-normal profits, new firms will enter the industry until all firms in the industry are earning just normal profits. If the prevailing price is such that the firms are incurring losses, some of the existing firms will leave the industry so that those remaining in the industry are again making at least normal profits.

Whereas the first three conditions ensure that average revenue curve or demand curve faced by an individual firm under perfect competition is perfectly elastic at the ruling market price, the fourth condition of free entry or exit guarantees that, in the long run, all firms must be earning just normal profits.
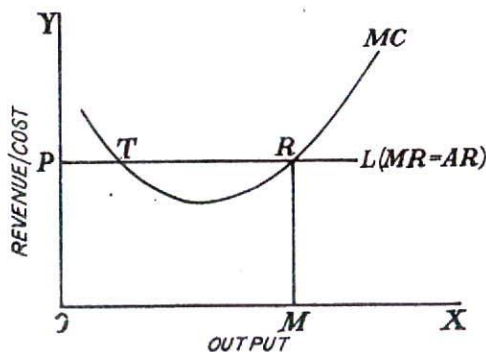
Conditions of Equilibrium

Under perfect competition, as explained earlier, price for an individual firm is given. It cannot influence the price by its own action. It works under the assumption that it can sell as much as it likes, at the prevailing price. Therefore, the demand curve or **average revenue curve facing a firm under perfect**

competition is **perfectly elastic** at the ruling price. Since a perfectly competitive firm can sell as much as it wants without affecting the price, addition made to total revenue by an extra unit of output, *i.e.*, marginal revenue, is equal to the price (average revenue) of the commodity.

Hence, **the average revenue (or demand) curve, (AR) and marginal revenue curve (MR) must coincide with each other for a firm under perfect competition.**

In Fig. 25.1, if price prevailing in the market is

Conditions of Equilibrium Under
Perfect Competition
Fig. 25.1

OP, then PL is both the average and marginal revenue curve. MC is the marginal cost curve. It may be noted that, under perfect competition, a firm's MC curve is also its supply curve. Given the price OP, the firm will fix its output where its profits are maximum. Profits are the greatest at the level of output for which marginal cost is equal to marginal revenue and marginal cost curve cuts the marginal revenue curve from below.

As explained in the previous Chapter (Fig. 24.3), at point T though MC is equal to MR but MC is cutting MR from above rather than from below. Therefore, T cannot be a position of equilibrium. At point R or output OM, the marginal cost equals MR and marginal cost curve is also cutting MR curve from below. Hence, at the output OM or point R, the profits would be maximum and the firm would be in equilibrium position. Marginal cost, which is equal to marginal revenue in equilibrium, must also be equal to price in equilibrium under perfect competition, since price and marginal revenue are equal under perfect competition.

Hence, conditions of firm's equilibrium under perfect competition are:—

(i) MC = MR = Price.
(ii) MC curve must cut MR curve from below.

Thus, a perfectly competitive firm will adjust its output at the point where its marginal cost is equal to marginal revenue or price, and marginal cost

1. Chamberlin, E.H.—*Theory of Monopolistic Competition*, 7th ed., p. 8.

curve cuts the marginal revenue curve from below. But producing at this point does not guarantee that the firm will always make positive profits. Whether or not there are positive profits depends on the relation between total cost and total revenue, or between average cost and average revenue (price).
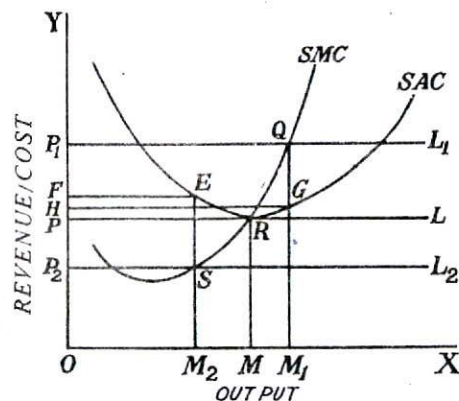
Equilibrium in the Short Run

The short run has been defined as a period of time sufficient to allow the firm to adjust its output by increasing or decreasing the amount of variable factors of production, but during which fixed factors of production cannot be altered. Thus, in the short run, the size and kind of plant cannot be changed, nor can new firms enter the industry.

Assumptions. In explaining the equilibrium of firm under perfect competition both in the short run and long run, we assume that all firms are working under **identical cost conditions**. Given this assumption, we shall explain the equilibrium of one firm and this explanation will apply to all other firms in the industry. Identical cost conditions for the firms mean that average cost and marginal cost curves are identical for all the firms. The entrepreneurs of all the firms are equally efficient. Further, we assume that the factors of production used by the different firms are homogeneous and are available at given and constant prices.

The above twin conditions of equilibrium ensure that profits have been maximised or losses mini- mised, but they do not tell about the firm's absolute profit or loss position. In this connection there are three possibilities: (a) When the firm makes super- normal profits; (b) When it makes only normal profits; and (c) When it incurs losses, but still does not shut down. Let us take them one by one.

(a) **When the firm makes supernormal profits in the short-run.** In Fig. 25.2, if the price is OP_1, the

Firm's Equilibrium: Short Run

Fig. 25.2

average-marginal revenue curve is $P_1 L_1$ and the firm is in equilibrium at point Q of output OM_1. In

this case, average cost is $M_1 G$, whereas price is OP_1 ($= QM_1$). Hence, profit per unit is GQ. The output is OM_1 ($= GH$). Hence, in this equilibrium position, the firm is making supernormal profits, which are equal to the area $P_1 QGH$. As all the firms in the industry have identical cost curves with the firm represented in Fig. 25.2, all would be making supernormal profits. There will be a tendency for the new firms to enter the industry to compete away these supernormal profits. But the short run is not a period sufficient for the new firms to enter; there- fore, the existing firms will continue to earn super- normal profits at the price OP_1 in the short period.

Thus, with price OP_1, all the **firms in the industry** will be in equilibrium at Q but **industry**, as a whole, will not be in equilibrium as there will be a tendency for the new firms to enter the industry.

(b) **The Firm just makes normal profit.** Now suppose that the ruling price in the market is OP. PL will then be the average-marginal revenue curve and the firm will be in equilibrium at the point R. At the point R, besides marginal cost being equal to marginal revenue and MC curve cutting MR curve from below, average revenue (or price) is also equal to average cost. Hence, with OP price and at the equilibrium point R or equilibrium output OM, the firm in Fig. 25.2, and hence all the firms in the industry, will be making only normal profits (normal profits are included in average cost curve). Since all the firms in the industry are making only normal profits, there will be no tendency either for the new firms to enter or for the existing firms to quit the industry.

Thus, even in the short run, the industry will be in equilibrium with price OP and firms producing OM at point R. In other words, even in the short run, full equilibrium, *i.e.*, equilibrium of all the firms as well as of the industry as a whole, will be achieved with price OP and the firm producing at point R or output OM.

But the attainment of full equilibrium in the industry in the short run is a rare phenomenon. It is only by accident that the industry will be in equili- brium in the short run. It is more likely that the long-run **adjustment in the number of firms takes place before the industry comes to be in equilibrium.**

(c) **The Firm incurring Losses, but does not shut down.** If the short-run price in the market were OP_2, instead of OP_1 and OP, the firm will be in equilibrium at point S, since with price OP_2, only at S the marginal cost is equal to marginal revenue or price OP, and MC curve cuts MR curve $P_2 L_2$ from below. But, at S or output OM_2, the firm is incurring losses, (Average revenue SM_2 is less than average cost EM_2 at the point S or output OM_2). The total losses in this situation are equal to the area $P_2 SEF$. This is the smallest loss that a firm can incur under the given price-cost situation, if it is to produce at all. Given the price OP_2 in the market, the loss of

the firm would be greater if it tries to produce at a point other than S.

Thus, we see that equating marginal cost with marginal revenue is optimal (when the second condition is also satisfied) even though profits are negative, because in that way losses are kept at the minimum. Since all the firms of the industry have identical cost conditions with the firm of Fig. 25.2, all would be incurring losses. The firms would have a tendency to quit the industry to go in search for normal profits elsewhere. But in the short run they cannot do so.

Thus, with price OP_2, all the firms would be in equilibrium at point S (though all will be incurring losses), but the industry, as a whole, will not be in equilibrium, since the firms will have a tendency to leave it.

The question now naturally arises: "Why at all should the firms continue operating if they are incurring losses. If they cannot leave the present industry, why do they not at least shut down (which they can even in the short run) to avoid losses? As we have said earlier, the short run is a period in which firms cannot alter their fixed capital equipment. They, therefore, will have to bear fixed costs in the short run even if they shut down. Only variable cost can be avoided by stopping production. Therefore, if a firm chooses to shut down in the short run, even then it will have to bear losses equal to the fixed cost of production.

Hence, if the firm in operation can earn revenue more than the variable cost, it will not be prudent for the firm to close merely because it is not possible to cover fixed costs fully. Instead, the firm should keep operating in the short run, if it can cover variable costs and make anything to cover a part of the fixed costs also. The saying 'half a loaf is better than none' is suggestive of prudent action, since it is better to obtain some revenue to meet a part of the fixed costs than none at all. But if the price happens to be so low that the firm cannot cover even its variable costs, it should shut down in order to minimize the losses.

Hence, if losses are greater than total fixed costs, *i.e.*, when revenue earned is even less than the total variable costs, the firm will shut down to avoid unnecessary losses.

Shut-down Point. The whole argument can be easily understood with the help of Fig. 25.3, where AC and MC are average cost and marginal cost curves respectively. AVC is the average variable cost curve. If price is OP_2, the firm is in equilibrium at S and is incurring losses equal to the area P_2SNF, but the firm is covering total variable cost and a part of the fixed costs, since price OP_2 ($=M_1S$) is greater than the average variable cost M_1K at the equilibrium output OM_1. Hence, in the short run, it is in the interest of the firm to keep operating at price OP_2.

But if the price happens to be OP_3, the firm will be in equilibrium at point D. At point D, the firm would be covering total variable costs but no part of the fixed costs, since price OP_3 is equal to Average Variable cost MD at the equilibrium output OM.
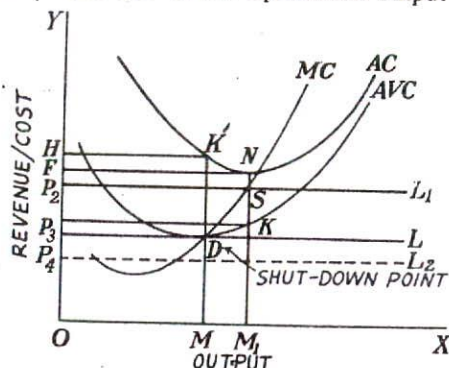
Equilibrium of Firm—Short Run:
Shut Down Point
Fig. 25.3

But if the price is less than OP_3 or MD (*i.e.*, if price is less than the bottom of AVC), the firm would shut down, as in that situation it would not cover even the variable costs, since the price will be less than the average variable cost. Point D is, therefore, called the **shut down point**. For example, at price OP_4, the firm would not cover even variable cost since OP_4 is less than the average variable cost at every level of output. With price OP_4, the firm's losses would be equal to fixed costs plus a part of the variable cost not covered by the total revenue. Therefore, the firm will refuse to produce any output at price OP_4 and wait for some good time to re-open.

Hence, we may conclude that a firm will shut down even in the short run, if the price falls below the bottom of Average Variable Cost curve.

Equilibrium in the Long Run

The long run is a period of time long enough to permit changes in the variable as well as in the fixed factors. In the long run, accordingly, all factors are variable and none fixed. Thus, in the long run, firms can change their output by increasing their fixed equipment. They can enlarge the old plants or replace them by new plants or add new plants. Moreover, in the long run, new firms can also enter the industry. On the contrary, if the situation so demands, in the long run, firms can diminish their fixed equipments by allowing them to wear out without replacement and the existing firms can leave the industry.

Thus, the long-run equilibrium will refer to a situation where free and full scope for adjustment has been allowed to economic forces. In the long run, it is the long run average and marginal cost

curves which are relevant for making output decisions. Further, in the long run, average variable cost is of no particular relevance. It is the average total cost which is of determining importance, since in the long run all costs are variable and none fixed.

We have discussed above that in the short run a firm under perfect competition is in equilibrium at that output at which marginal cost equals price (or Marginal Revenue). This is equally valid in the long run. But, in the long run for a perfectly competitive firm to be in equilibrium, besides marginal cost being equal to price, price must also be equal to average cost. If the price is greater than the average cost, the firms will be making supernormal profits. Lured by these supernormal profits, new firms will enter the industry and these extra profits will be competed away. When the new firms enter the industry, the supply of output of the industry will increase and hence the price of the output will be forced down. The new firms will keep coming into the industry until the price is depressed down to average cost, and all firms are earning only normal profits.

On the other hand, if the price happens to be below the average cost, the firms will be incurring losses. Some of the existing firms will quit the industry. As a result, the output of the industry will decrease and the price will rise to equal the average cost so that the firms remaining in the industry are making normal profits.

Hence, in the long run, firms need not be forced to produce at a loss since they can leave the industry, if they are having losses.

Thus, for a perfectly competitive firm to be in equilibrium in the long run, the following two conditions must be satisfied.

    Price = Marginal Cost.

    Price = Average Cost.

But if price equals both the marginal and the average costs then for the long-run equilibrium of the firm under perfect competition, we have a combined condition:

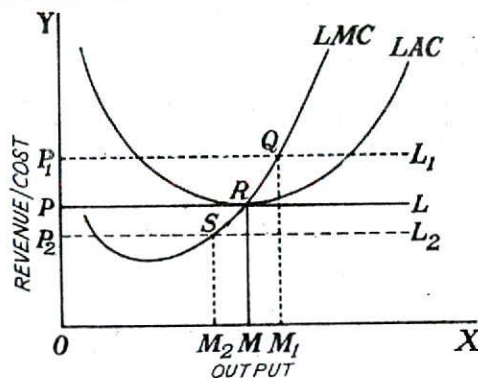   **Price = Marginal Cost = Average Cost.**

Now when average cost curve is falling, marginal cost curve is below it, and when average cost curve is rising, marginal cost curve must be above it. Hence, marginal cost can be equal to the average cost only at the point where average cost curve is neither falling nor rising, i.e., at the minimum point of average cost curve. Therefore, it is at the point of minimum average cost curve that marginal cost curve intersects the average cost curve, and the two are equal there.

Thus, the conditions for long-run equilibrium of perfectly competitive firm can be written as:

    Price = Marginal Cost = Minimum Average Cost.

The conditions for the long-run equilibrium of

the firm under perfect competition can be easily understood from the Fig. 25.4, where LAC is the

Equilibrium of Firm: Long Run
Fig. 25.4

long-run average cost curve and LMC is the long-run marginal cost curve. The firm under perfect competition cannot be in long-run equilibrium at price OP_1, because though the price OP_1 equals MC at Q (i.e., at output OM_1) but it is greater than the average cost at this output and, therefore, the firm will be earning supernormal profits. Since all the firms are assumed to be identical, all would be earning supernormal profits. Hence, there will be incentive for the new firms to enter the industry. As a result, the price will be forced down to the level OP at which price, the firm is in equilibrium at R and is producing OM output. At point R or equilibrium output OM, the price is equal to average cost, and hence the firm will be earning only normal profits (normal profits are included in average cost). Therefore, at price OP, there will be no tendency for the outside firms to enter. Hence, the firm will be in equilibrium at OP price and OM output.

On the contrary, a firm under perfect competition cannot be in the long-run equilibrium at price OP_2. Though price OP_2 is equal to marginal cost at point S, or at output OM_2 but price OP_2 is lower than the average cost at this point and thus the firm will be incurring losses. Since all the firms in the industry are identical in respect of cost curves, all would be incurring losses. To avoid these losses, some of the firms will leave the industry. As a result, the price will rise to OP, where again all firms are making normal profits. When the price OP is reached, the firms would have no further tendency to quit.

Thus, we conclude that at price OP, the firm under perfect competition is in equilibrium in the long run when:

    Price = MC = Minimum AC.

Now, at price OP, besides all firms being in equilibrium at output OM, the industry will also be in equilibrium, since there will be no tendency for new firms to enter or the existing firms to leave the

industry, because all will be earning normal profits. Thus, at OP price, **full equilibrium,** *i.e.,* equilibrium of all the individual firms and also of the industry, as a whole, is achieved in the long run under perfect competition.

Tendency to Optimum. An important conclusion that follows from the above discussion of firm's equilibrium in the long run is that the forces of competition force all the firms to produce at the minimum point of the average cost curve. In other words, all the firms under perfect competition tend to be of the **optimum size** in the long run. This is advantageous from the viewpoint of consumers, since the product in question is being produced in the cheapest possible manner without any firm incurring a loss.

RELEVANCE OF PURE COMPETITION

We have discussed the equilibrium of firm under pure competition. But pure competition is practically non-existent in the real world, Then what is the relevance of pure competition?

Advantages of Pure Competition. Broadly speaking, the advantages of pure competition can be put under two main headings: (1) The purely competitive firm produces at the most efficient level of production. This is so because (a) Since the firm has no control over price, its marginal revenue curve is perfectly elastic. The pressure of competition forces the price to the point at which the firm can make only normal profit. This point conforms to the level of full capacity and a level that can be achieved at the lowest per-unit cost. (b) The purely competitive firm is under compulsion to use the most economical and modern methods of production so that its cost may be brought down to a competitive level. The normal-profit prices will weed out the old-fashioned and technologically backward firms by putting them to loss. (c) Pure competition is characterised by homogenous or identical products. Hence advertisement is unnecessary. This cuts down cost and makes for economical production

Disadvantages of Pure Competition. But pure competition is not an unmixed blessing It has some disadvantages too: (a) Since the product is homogeneous, consumers' tastes for variety remain unsatisfied. (b) In a purely competitive situation, the firms have to sacrifice economies of scale or the use of modern technology. (c) Purely competitive firms lack the resources to engage in extensive research and development.

What is then the use or relevance of the purely competitive model?

The study of the purely competitive model can be justified on the following grounds:

(a) Although pure competition is a rare phenomenon, there are at any time in existence certain industries which resemble a competitive model. The example is of a contractors' firm in a garment industry, where the number of firms is large, their size small and capital investment low.

(b) From the purely competitive model we can come to know how outside forces affect an industry. Agriculture is a purely competitive industry which is vitally affected by external factors.

(c) The study of the purely competitive market structure is helpful in understanding the imperfectly competitive model. The competitive model furnishes an ideal yard-stick for other market forms. The economists have made a good use of the purely competitive model to analyse capitalism. We can understand the monopolistic markets by reference to competitive models or as departures from pure competition.

(d) Purely competitive model is a very useful starting point for economic analysis in the real world conditions. In this competitive model, we assume a situation devoid of all interference from extraneous factors. It is a situation in a vacuum. Then one by one we introduce other factors to make the situation conform to the world of reality.

(e) An understanding of a purely competitive model can enable us to study the beneficial effects of increased production. We can understand, for instance how competition lowers prices, costs and profit margins under the impact of increased production. This is highly beneficial to the general public. When we understand the purely competitive model, we can grasp the force of anti-trust or anti-monopoly arguments and arguments for lowering the tariff barriers, reduce import quotas and have freer inernational trade.

EQUILIBRIUM UNDER IMPERFECT COMPETITION

(Equilibrium under imperfect competition, i.e., under monopoly, monopolistic competition and oligopoly and duopoly is discussed respectively in chapters 28, 29 and 30 as price-output determination under the respective market conditions. Price-output determination is nothing else except discussing conditions of equilibrium).

<table>
<tr><td>**26**</td><td>**SUPPLY CURVE OF PERFECTLY COMPETITIVE INDUSTRY**</td></tr>
</table>

Concept of Supply Curve

The supply curve of an industry depicts the various quantities of the product that it would offer to sell at various prices at a given time.

The quantities that the industry can offer to sell will depend on the price of its good in relation to the cost conditions of the firms. The cost conditions, in their turn, depend on the prices of the factors of production or inputs used by the firms and their production function. Hence, the supply of the industry will change not merely when the price of its good changes, but also as a result of a change in the production functions. This gives us the **supply function** of the industry as under:—

$$S_A = f(P_A, P_X, P_Y, P_Z \ldots \ldots \ldots \ldots \text{PF})$$

Here

S_A is the quantity of the good A supplied.

f represents the functional relationship, *i.e.*, varies with.

P_A is the price of the good A.

P_X, P_Y and P_Z are the prices of the factors used in production.

P_F represents all the production functions of the firms.

Thus, the factor prices and the production functions are the parameters of the supply curve. That is, any change in the factor prices or the production functions will shift the supply curve to a new position, for this will mean a change in the very condition of supply (*i.e.*, the supply function). For instance, a shift in the supply curve to the right of the original supply curve will mean that owing to improvement in technology or to a fall in the factor prices, the industry is now in a position to supply a larger output at every price of its good. In other words, it is prepared to supply any output at a lower price than before. A rise in factor prices will have the opposite effect.

It is to be borne in mind that the concept of supply curve is relevant only to perfect or pure competition, and not to cases of imperfect competition, namely, monopolistic competition, monopoly and oligopoly. The reason is obvious. In the discussion of supply curve, we say how a firm adjusts (increases or decreases) its output in response to changes in price. To a firm under perfect competition price is given; it cannot influence it in any manner; it has to accept it. The only thing that a firm can do is to adjust its supply to the prevailing price. Thus, under perfect competition, a firm is a quantity-adjuster. But under various forms of imperfect competition, *e.g.*, imperfect competition or absolute monopoly, the firm can set its own price. Price-output determination is under its control. There is no question of adjusting output or supply to a given price as under perfect competition, but of choosing that price-output which maximizes its profit.

As Professor Baumol observes, the supply curve is, strictly speaking, a concept which is usually relevant only for the case of pure (or perfect) competition . . . . The reason for this lies in its definition—the supply curve is designed to answer questions of the form, "How much will firm A supply if it encounters a price which is fixed at P dollars"? But such a question is most relevant to the behaviour of firms that actually deal with prices over whose determination they exercise no influence". This situation is that of perfect competition and not any form of imperfect competition.

We shall now study both the short-run and long-run supply curves for a competitive industry, since its intersection with the market demand curve will determine the short-run and the long-run competitive prices respectively.

1. Boumol I. W.—*Economic Theory and Operation Analysis*, 2nd ed., p. 342.
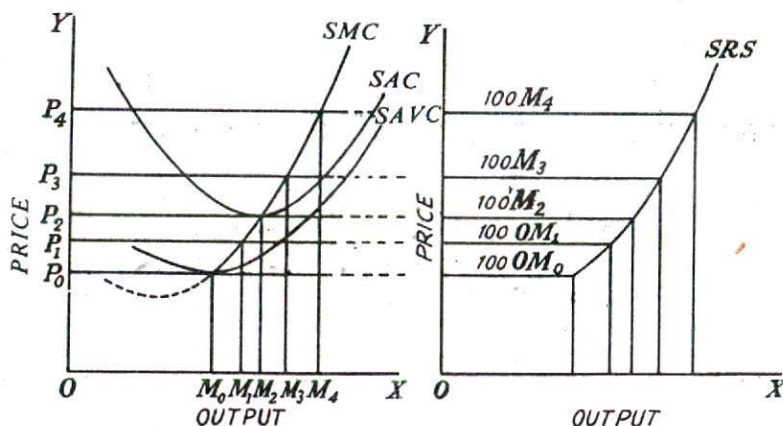
(a)   Deriving Short-run Supply Curve   (b)

Fig. 26.1

Short-run Supply Curve

As seen previously, the short-run is a period in which the capital equipment is fixed and the increased demand is met only by the intensive use of the given plant, *i.e.*, by increasing the amount of the variable factors. We have studied above that a firm under perfect competition produces an output at which marginal cost equals price. The short-run marginal cost curve of the firm, therefore, indicates the quantities which the firm will produce in the short run at all possible prices. **Thus, the short-run marginal cost curve of the firm is the supply curve of the perfectly competitive firm in the short run.**

This is illustrated in Fig. 26.1 (a). At price OP_4, the firm will produce or supply an amount equal to OM_4, since only at this output, price OP_4 equals marginal cost. Similarly, at price OP_3, the firm will supply an amount OM_3 and at prices OP_2 and OP_1 it will supply the amounts OM_2 and OM_1 respectively. As explained before, a firm in the short run will not supply at prices below the minimum average variable cost, since at prices below the minimum average variable cost, it will not be covering even variable costs. Therefore, **the firm's short-run supply curve is identical with that portion of the short-run marginal cost SMC curve which lies above the minimum point of the short-run average variable cost (SAVC) curve.** The quantity supplied would be zero at all prices less than the minimum average variable cost. The firm's short-run supply curve, therefore, consists of the shaded or thick (not dotted) segment of the SMC curve in Fig. 26.1 (a).

The short-run supply curve for the whole perfectly competitive industry is derived by the lateral summation (*i.e.*, adding up sideways) of that part of all the firms' marginal cost curves which lies above the minimum points on their average variable cost curves. If a hypothetical competitive industry consists of 100 identical single-plant firms, one of which

is pictured in Fig. 26.1 (a), the industry would supply an amount equal to 100 OM_1 at price OP_1, 100 M_2 at price OP_2, 100 OM_3 at price OP_3, and so on. The industry would not supply any output at prices less than OP_0. SRS is the short-run supply curve of the industry.

It may be noted that while Y-axis of both the Figs. 26.1 (a) and 26.1 (b) have been drawn on the same scale and represent price per unit, scales of the X-axes of the two Figs. 26.1 (a) and 26.1 (b) are not the same.

Thus, we see that the short-run supply curve of the perfectly competitive industry always slopes upwards, since the short-run marginal cost curve (above the minimum point of the AVC) of individual firms always slopes upwards too. How steeply will the industry's short-run supply curve rise will obviously depend on the slope of the cost curves of the individual firms in the industry. The elasticity of the short-run supply curve of the industry will depend on the elasticity of the marginal cost curves of the individual firms in the industry.

Long-run Supply Curve

As already mentioned, long run is a period sufficiently long to allow changes in both the size as well as the number of firms in the industry. If there is an increase in demand, in the short run, it will be met by over-utilisation of the existing plant. But if the increased demand persists in the long run, it will be met by both the expansion of the existing firms as well as by the entry of new firms in the industry.

Long-run supply is defined as supplies offered at various prices by the existing as well as the potential producers in the long run. As explained before, a firm under perfect competition is in long-run equilibrium when it is equalizing price with both marginal cost and average cost. The forces of competition (*i.e.*, free entry or exit of the firms) force the firm under perfect competition to produce at the mini-

mum point of its average cost curve in the long-run equilibrium.

On a little reflection, it will be clear that the long-run supply curve of the perfectly competitive industry cannot be the lateral summation of the long-run marginal cost curves of the firms as in short-run supply curve. This is so because, in the long-run equilibrium, owing to the free entry or exit of the firms under perfect competition, firms are forced to produce only at the minimum point of the long-run average cost curve where the long-run marginal cost curve intersects it. It is also because the expansion of the industry, *i.e.*, increase in the number of firms, brings about shifts in the cost curves of the firms due to the emergence of external economies and diseconomies of production. Moreover, the number of firms in the long-run equilibrium varies at different prices.

The concept of external economies and diseconomies is important in describing the shape of the long-run supply curve. External economies and diseconomies are those economies and diseconomies which are realised by each member firm as a consequence of the expansion of the whole industry. An expansion of the industry may lead to the availability of new and cheaper raw materials, tools and machinery, and to the discovery and diffusion of new and cheaper techniques of production.

Some raw materials and tools may be made available at reduced prices. This is so because, as the industry grows, subsidiary and correlated firms may spring up in the vicinity of the industry to provide it with raw materials and tools at the reduced prices. Further, as the industry expands trade journals may appear which help in discovering and spreading new technical knowledge. Moreover, with expansion of the industry, specialised firms may come into existence which work up its 'waste products'. The industry can then sell them at good price.

Thus, the entry of firms enlarging the size of the industry may enable all firms to produce at lower costs. The large-scale firms reap internal economies. The large-scale industry brings to the firms constituting the industry external economies. The availability of internal economies will shift the marginal and average cost curves of the firms below the previous level. There is every possibility of external economies to be reaped when a young industry grows in a new territory. But it is extremely doubtful whether external economies continue to accrue as a well-established good-sized industry experiences further growth.

On the contrary, an expanding industry may experience external diseconomies. As more firms enter into the industry, competition among them may push up the prices of scarce raw materials, skilled labour and other scarce factors or inputs. Further, the additional factors of production, other than entrepreneur, coming into the industry may be less efficient than the previous ones. The emergence of the external diseconomies will shift the marginal and average cost curves above the previous level.

Thus, whether a particular industry on expansion will experience the phenomenon of rising costs or falling costs or constant costs will depend upon the combined result of external economies and diseconomies. The long-run supply curve of a perfectly competitive industry will, therefore, have different shapes depending upon the fact:

   (i) whether the industry in question is a constant cost industry;
  (ii) increasing cost industry; or
 (iii) decreasing cost industry.

We shall now examine these cases.

Supply Curve of the Constant Cost Industry

A constant cost industry will be one in which the external economies and diseconomies may cancel each other so that the constituent firms of an enlarged industry do not experience any shift in their cost curves. An industry can also be a constant cost industry if its expansion generates neither external economies nor external diseconomies.

Obviously, as the number of firms in the industry increase, there will be increased demand for productive factors like raw materials, labour, capital *etc.*, by the industry; and if the prices of these productive factors rise, as the industry expands, then the costs must rise. Hence, a constant cost industry, therefore, must be one which makes little impact on the market for these productive resources. In other words, its demand for these productive factors must be a very small proportion of the total demand for these factors. It is only then that the increased demand for these factors, as a result of the expansion of the industry, will not raise the prices of these factors.

The paper-doll industry might be a case in point. This industry uses such a small proportion of the total quantity of paper produced in a year that a large increase in its demand for paper as a result of its expansion would have no perceptible influence on the price of paper. Similarly, the increased demand for labour in the paper-doll industry would have little effect of raising the wages of the labour generally.

In the case of constant cost industry, which is shown in Fig. 26.2 (b), the long-run supply curve will be a horizontal straight line at the level of minimum long-run average cost curve.

Every firm will be in long-run equilibrium where Price = MC = AC, *i.e.*, at the minimum point of the long-run average cost. In the long run, new firms will enter the industry without raising or lowering the cost curves of the firms in the industry so that the industry would supply any amount of commodity at
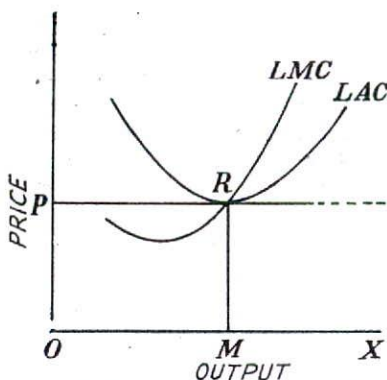
Long-run Supply Curves:
Fig. 26.2 (a)
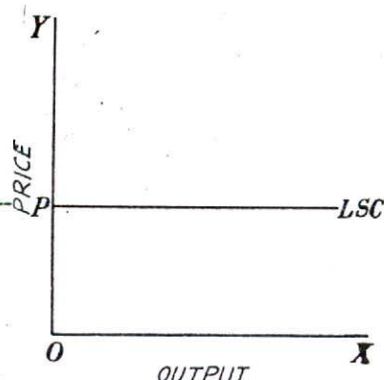
A Constant Cost Industry
Fig. 26.2 (b)

the price OP which is equal to the minimum long-run average cost.

Thus, we see that in case of the constant cost industry, the new firms, which will enter the industry in the long run, will have identical cost conditions with the already existing ones; and all firms will produce at the minimum point of the average cost curve. The additional supplies of the product will come primarily from the entry of new firms—having the same minimum average cost so that any amount can be supplied at the price equal to the minimum average cost by the increase in the number of firms.

In Fig. 26.2 (b), LSC is the long-run supply curve of the constant cost industry and in Fig. 26.2 (a), LAC and LMC are the long-run average and marginal cost curves respectively. The long-run marginal cost curve of the firms in its relevant portion slopes upwards but the long-run supply curve is horizontal straight line (i.e., perfectly elastic) at price OP, which is equal to the minimum average cost. Thus, it will be clear that the long-run supply curve is not the lateral summation of the long-run marginal cost curves.

Supply Curve of the Increasing Cost Industry

If the industry is of appreciable size and its demand for productive resources constitutes a suffi-

ciently large part of the total demand for the resources, then its expansion will cause their prices to rise. The wages of specialized labour and the prices of other scarce factors like raw materials, capital equipment are bound to rise as the demand for them increases as a result of the expansion of the industry. There may be some external economies but generally the external diseconomies will overweigh the external economies.

Thus, these net external diseconomies will raise the costs and, therefore, shift both U-shaped average and marginal cost curves of all the firms (both existing as well as the new ones) above the previous level. As a result, the minimum average cost will rise.

Every firm will be in long-run equilibrium where Price = MC = minimum AC. But this price and minimum average cost will be higher than the one before expansion of the industry. It is, therefore, clear that the additional supplies of the product by new firm, in the case of increasing cost industry, will be forthcoming only at a higher price. The long-run supply curve (LSC) of the increasing cost industry will, therefore, slope upwards as shown in Fig. 26.3 (b).

In Fig. 26.3 (a), the new, i.e., dotted long-run
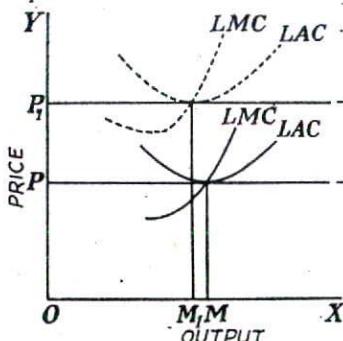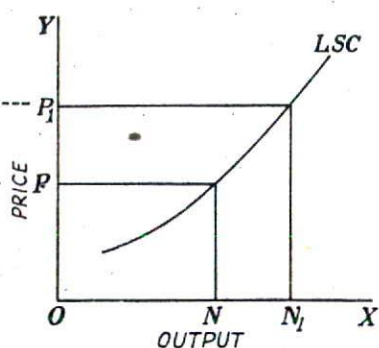
Long-run Supply Curve:
Increasing Cost Industry
Fig. 26.3

average cost curve (LAC) and long-run marginal cost curve (LMC) have been shifted up a little as a result of the net external diseconomies due to the increase in the number of firms in the industry. Every firm will be in equilibrium at OM_1 output, where it will be equalizing price OP_1 with new marginal cost and new minimum average cost. More will be supplied at price OP_1 than at the old price OP [see Fig. 26.3 (b)], because there will be **larger number of firms at price OP_1 than those at OP** and, therefore, the long-run supply curve slopes upwards to the right.

This case of upward sloping supply curve is probably the most typical of the actual competitive world. That is so because productive resources are used in various industries; hence higher prices have to be paid to transfer these resources from one industry to another.

Supply Curve of the Decreasing Cost Industry

It is conceivable that an industry might have decreasing costs due to net external economies. As a young industry grows in a new territory, it is likely that external economies may overweigh the external diseconomies so that, with the expansion of the industry, production costs would be reduced. The presence of net external economies will shift the cost curves of the firms (both existing as well as new ones) downward.

The cost curves of a young industry with its expansion may be lowered (a) because cheaper and better trained labour becomes available, (b) because better information centres and markets are created, (c) because productivity of the factors in one firm is enhanced by expanded production in others or (d) because raw materials produced at decreasing costs by other specialised industries are obtained cheaply.

Owing to the external economies, the additional supplies of the product will be forthcoming at reduced prices. Every firm after expansion will be in equilibrium where it is equating price with marginal

cost and minimum average cost. But this new price and minimum average cost will be lower than the original ones.

Fig. 26.4 (a) depicts the position of one firm but all firms are supposed to have identical conditions. At the initial price OP, before expansion of the industry, every firm will be in equilibrium at E and will be producing OM. The total supply of the product by the industry at price OP would be ON [Fig. 26.4 (b)]. As the new firms enter, in the long run under the stimulus of increased demand, additional supplies of the product will be coming at the lower price OP_1, since costs would be reduced with the expansion of the industry. The new dotted LAC and LMC curves are long-run average and marginal cost curves respectively after the industry has expanded due to the entry of new firms. In this new position, every firm will be in long-run equilibrium equating price OP_1 with new marginal and minimum average cost at E_1 and producing OM_1. The total supply of the product by the industry will be ON_1 [Fig. 26.4 (b)]. The total supply will be greater at the new price OP_1 than at the old price OP partly because of the larger production by the existing firms but mainly because there will be a greater number of firms at OP_1.

Summing up

From the above discussion, it follows that while the short-run supply curve of the industry always slopes upwards, the long-run supply curve may be a horizontal straight line, sloping upwards or sloping downwards depending upon the fact whether the industry is a constant cost, an increasing cost or a decreasing cost industry. But, as mentioned above, the long-run upward sloping supply curve is more in conformity with the actual world, since external economies are very much limited in scope in the real world. The productive resources are required in all lines of production and increased demand for them by any industry is bound to push their prices up.

Long-run Supply Curve :
Decreasing Cost Industry

Fig. 26.4

27 PRICE-OUTPUT DETERMINATION— PERFECT COMPETITION
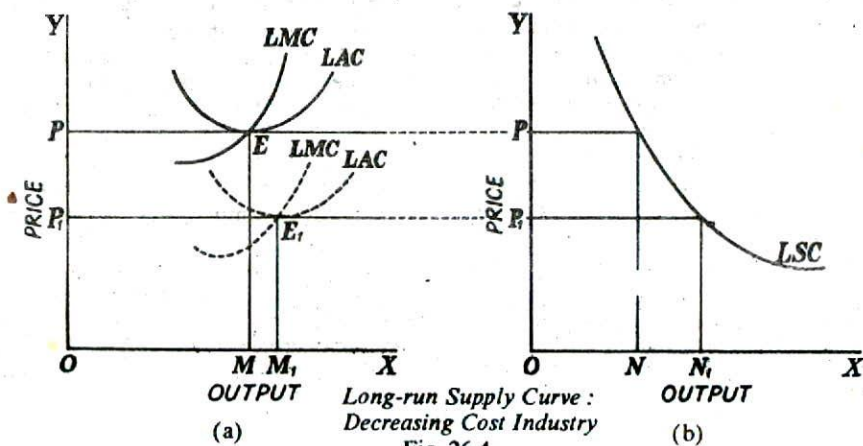
Our main purpose in the preceding chapters was to bring us to a position where we can explain how price is determined under conditions of perfect competition. In the discussion of consumer's behaviour, we assumed that, under perfect competition, a single buyer or consumer is unable to influence the price and, therefore, takes the market price as given and allocates his money expenditure so as to obtain maximum satisfaction. On this assumption, we derived demand curve for a product of a single consumer as well as of the market as a whole (*i.e.*, of all the consumers or buyers of the product) both according to the old Marshallian utility analysis and the new indifference curve technique.

Similarly, we studied the behaviour of the entrepreneur or firm under perfect competition assuming that a single firm or producer cannot affect the price of his product by his own individual action. A single firm under perfect competition then takes the market price as given and adjusts its output so as to obtain maximum profits. On this assumption, we discussed in details the conditions for the firm's equilibrium in perfect competition and derived both short-run and long-run supply curves of the firm as well as of the whole industry.

Now the interaction between these two forces of demand and supply determines price in the market. It is not the demand and supply of a single buyer and a firm respectively that determines price but it is the demand of all the buyers taken together and the supply of all the firms taken together that determine the price by their interaction. We see, therefore, that the price of a commodity which is given for each individual consumer or firm is determined by all the consumers and firms that buy and sell.

Two Approaches

There are two well known approaches to pricing under perfect competition, *viz.*, partial equilibrium approach and the general equilibrium approach.

The first is set by Alfred Marshall and the second by Walras. We have already discussed partial Equilibrium and General Equilibrium in Chapter 3 of this book.

Partial Equilibrium Approach

In the partial equilibrium approach to pricing, we explain price determination of a single commodity, keeping the prices of other commodities unchanged. We assume that the prices of various commodities are independent of one another and do not mutually affect one another. Marshall explains this approach thus, "The forces to be dealt with are. however, so numerous that it is best to analyse a few at a time and work out a number of partial solutions as auxiliaries to our main study. Thus we begin by isolating the primary relations of supply, demand and price in regard to a particular commodity. We reduce to inaction all other forces by the phrase 'other things being equal.' We do not suppose that they are inert, but for the time we ignore their activity."

Thus, in the Marshallian or partial equilibrium approach to pricing under perfect competition, demand for a commodity is determined on the assumption that prices of other commodities, tastes and incomes of the consumer remain constant. Similarly, supply is determined on the assumption that the prices of other commodities, prices of resources or factors and production functions remain the same. The partial equilibrium analysis discusses only the price determination of a commodity in isolation and does not explain how the prices of the various commodities are inter-dependent and inter-related.

Thus, the partial equilibrium analysis is based on the assumption that the changes in any single sector of the economy do not significantly affect the other sectors. As Prof. Lipsey observes, "All partial equilibrium analyses are based on the assumption of

ceteris paribus. Strictly interpreted, the assumption is that all other things in the economy are unaffected by any changes in the sector under consideration (say sector *A*). This assumption is always violated to some extent, for anything that happens in one sector must cause changes in some other sector. What matters is that the changes induced throughout the rest of the economy are sufficiently small and diffused so that the effect they in turn have on the sector *A* can be safely ignored." [1].

General Equilibrium Approach

The general equilibrium analysis does not assume that the price of a good is determined independently of the prices of other goods. It supposes rather that a change in the price of a particular good affects prices and quantities demanded of other goods and the changes in prices of the other goods affect the price and quantity demanded of this particular good. Thus, the general equilibrium analysis explains the mutual and simultaneous determination of the prices of all goods and factors. It thus "looks at **multi-market equilibrium.** It considers the way in which the prices of all goods in an economic system are set simultaneously each in its own Flex-price market" [1]

We have said above that the partial equilibrium approach assumes that the effect of a change in price of a particular good will be so diffused in the rest of the economy that it will have a negligible effect on the prices of other goods. But when the effect is significant as in the case of inter-related goods, the partial equilibrium analysis ceases to be applicable. In such cases, we have to resort to the general equilibrium approach. As Stonier and Hague observe, "If X and Y are either strongly complementary or strongly competitive, a fall in the price of X can have a substantial effect on the demand for Y. General equilibrium analysis attempts to take account of such relationship." [2]

Hence "to explain the inter-relationship and inter-dependence among the prices and quantities of goods and factors ultimately to explain the determination of the relative prices of all goods and factors, the proportion in which different goods are being produced and different factors are being used for the production of different goods is the essence of general equilibrium analysis." [3]

Professor Ryan explains the general equilibrium thus, "Let us suppose that the whole economy is initially in 'general' equilibrium; that is, that at the going prices the planned sales of each commodity

and productive services are equal to the planned purchases . . . . When a 'general' equilibrium is disturbed by some economic event there will ensue a process of adjustment and re-adjustment during which each price affects, and is in turn affected by, each other price. The change in pattern of prices is in part the cause, and in part the consequence, of revision in the purchases and sales plans of individuals, households and firms . . . . Ultimately, a new equilibrium will emerge in which the planned sales of each commodity and productive services will again be equal to the planned purchases. In the new 'general equilibrium', full adjustment will have been made to the new conditions." [4] In this chapter, we shall confine ourselves to partial equilibrium approach. The general equilibrium approach is beyond this level of this study.

Price Determination: General Statement

Before Marshall, there was a dispute among economists on whether the force of demand (*i.e.,* marginal utility) or the force of supply (*i.e.,* cost of production) is more important in determining price. Marshall gave equal importance to both the demand (or marginal utility) and supply (or cost of production) in the determination of the value or price.

Marshall's famous analogy of a pair of scissors is worth quoting. "We might as reasonably dispute whether it is the upper or the under blade of a pair of scissors that cuts a piece of paper, as whether value is governed by utility or cost of production. It is true that when one blade is held still and the cutting is effected by moving the other, we may say with careless brevity that the cutting is done by the second, but the statement is not strictly accurate and is to be excused only so long as it claims to be merely a popular and not a strictly scientific account of what happens". Thus, neither the upper blade nor the lower one taken separately can do the work of cutting, both have their importance in the process of cutting. The lower blade may be kept stationary and only the upper one may be moved, yet both are indispensable for the process of cutting.

"The only really accurate answer to the question whether it is supply or demand which determines price is that it is both. At times it will seem that one is more important than the other, for one will be active and the other passive. For example, if demand remains constant but supply conditions vary, it is demand which is passive and supply active. **But neither is more or less important than the other in determining price.**" [5]

Thus, the demand of all consumers and the supply of all firms together determine the prices which are then taken as given by each one of them.

1. Lipsey, R. G.—*An Introduction to Positive Economics,* III Ed. 1971, p. 404.

2. Stonier and Hague, *Text Book of Economic Theory,* IV Ed. 1972, p. 383.

3. Ahuja H. L. *Advance Economic Theory* 1975, p. 489.

4. Ryan. W. J. L., *Price Theory* 1958, p. 244, 246-47.

5. Stonier and Hague—*A Text-book of Economic Theory,* p. 155.

Equilibrium Price

In the chapters on demand analysis—both in Marshallian utility analysis and indifference curve technique, we concluded that a demand curve normally slopes downwards. In other words, it means that, other things remaining the same, more quantity of a commodity will be demanded at a lower price than that at a higher price. Similarly, we saw in an earlier chapter that the supply curve of the commodity normally slopes upwards. In other words, the producers will offer to sell larger quantity of the product at a higher price than at a lower one. Supply depends on the number and size of firms, production techniques and the prices of the productive resources.

Thus, quantity demanded and quantity supplied vary with price. The price which will tend to settle down or come to stay in the market is one at which the quantity demanded is equal to the quantity supplied. Only at the price at which quantity demanded is equal to the quantity supplied, will all the buyers' and sellers' wishes be satisfied. This price at which demand and supply are equal is known as an **equilibrium price**, since, at this price, the forces of demand and supply are balanced, or are in equilibrium. The quantity bought and sold (or the amount demanded or supplied) at this equilibrium price is known as **equilibrium amount.**

If the equality between quantity demanded and supplied does not hold for some price, buyers' and sellers' desires are inconsistent: either the amount demanded by the buyers is more than that offered by the sellers or the amount offered by the sellers is greater than the amount demanded by the buyers. In either case, the price will change so as to bring about equality between quantity demanded and quantity supplied.

An example both in terms of schedules and curves will make the whole thing clear. The table given below gives the demand and supply schedules relating to a variety of common cloth and in Figure

TABLE

Price per metre	Quantity demanded (million metres) per month	Quantity supplied (million metres) per month	Pressure on price
Rs.			
5	9	18	↓ Falling
4	10	16	↓ Falling
3	12	12	Neutral
2	15	7	↑ Rising
1	20	0	↑ Rising

27.1, DD is the demand curve and SS is the supply curve. A glance at the table and the figure will show

how the price is determined between the demand and supply.
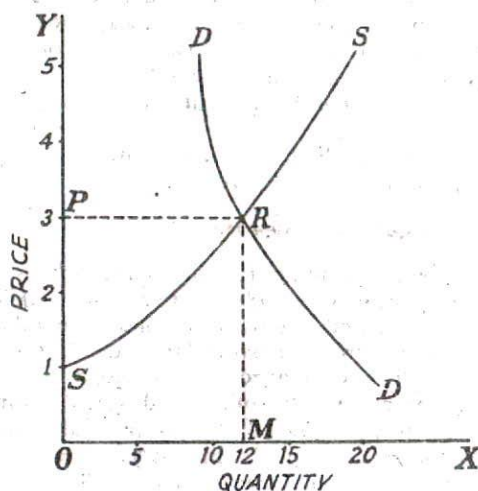
Interaction of Demand and Supply
Fig. 27.1

It will be seen that when price is Rs. 3 per metre, 12 million metres are supplied and 12 million of metres are demanded, i.e., the quantity demanded is equal to the quantity supplied. Rs. 3 per metre, therefore, is the equilibrium price. Price is at equilibrium at Rs. 3. In other words, price of Rs. 3 will persist in the market, because at this level there is no tendency for it to rise or to fall. Of course, this equilibrium price may not be reached at once. There may have to be an initial period of trial and error and of oscillations around this equilibrium level before the price finally settles down and supply balances demand.

If the price is Rs. 5 (i.e., above the equilibrium level), the quantity offered (18 million metres) by the sellers will be greater than the quantity demanded (9 million metres) and there will be a tendency for the price to fall. At the price of Rs. 5, some of the sellers will be unable to sell all the quantity they want to sell and will, therefore, cut down the price in order to attract customers.

On the other hand, as the price falls, the quantity demanded will increase and the quantity supplied will decline in the way shown in the table until at the price of Rs. 3 per metre at which supply balances demand. At this price, the whole quantity of the product, which all sellers are willing to sell, will be purchased by the buyers.

Similarly, if the price is Rs. 2 per metre, i.e., below the equilibrium price, the amount of the cotton cloth demanded (15 million metres) by the buyers will exceed the amount offered to supply (7 million metres), therefore, the price of cotton cloth will tend to rise. Since at Rs. 2 the quantity demanded exceeds the quantity supplied, the buyers who are willing to

buy at this price will find that the quantity offered is not sufficient to satisfy their wants, *i.e.*, sellers are not willing to supply as large a quantity as buyers demand. Hence, some of the consumers, who have not been able to satisfy their demand, will be induced to bid the price up in the hope of getting more supplies. This action of unsatisfied buyers will push up the price in the market up to the equilibrium level.

Thus, Rs. 3 is the equilibrium price and 12 million metres is the equilibrium amount, because only at this price of Rs. 3 per metre will there be no tendency for the price to rise or to fall; only at this price the same quantity is demanded and supplied. Only at this price will there be no unsatisfied buyers or sellers who are prepared to let prices alter to satisfy their desires.

From the above discussion, it follows that the equilibrium between demand and supply, or what is often called market equilibrium, determines the price in the market. Price comes to stay in the market at the level where demand and supply curves intersect each other.

The equilibrium price will change if either the demand or the supply curve change due to a change in demand or supply conditions. Given the supply curve, an increase in demand (*i.e.*, shift of the demand curve to the right) will raise the price and a decrease in demand (*i.e.*, shift of the demand curve to the left) will lower the price. On the contrary, an increase in supply (*i.e.*, shift of the supply curve to the right), demand curve remaining the same, will lower the price and a decrease in supply (*i.e.*, shift in the supply curve to the left) will raise the price.

The change in equilibrium price as a result of change in demand or supply curve is shown in Fig. 27.2 given below. In Fig. 27.2(a) SS is the supply curve and DD is the demand curve. If now there is an increase in demand from DD to D'D', the supply curve remaining the same, equilibrium price will rise to OP' (=M'R') at which the new demand curve D'D' intersects the supply curve SS at the point R'. As a result of the increase in demand, equilibrium amount demanded and supplied will also rise to OM'. On the contrary, if demand decreases from DD to D''D'', the equilibrium price will fall to Op'' (=M''R'') and the equilibrium amount will decrease from OM to OM''.

On the other hand, in Fig. 27.2 (b), demand curve DD remains the same and it is the supply curve which shifts. To begin with, SS is the supply curve which intersects the demand curve DD at the price OP. If now the supply curve increases from SS to S'S', the equilibrium price will fall to OP' (=R'M') and the equilibrium amount will increase to OM'. If supply decreases from SS to S''S'', the equilibrium price will rise to OP''(=R''M'') and the equilibrium amount will decrease to OM''.

Thus, we see that changes either in demand or supply will change the equilibrium price.

Demand and Supply only Superficially Affect Price

From the above analysis, it seems that price is determined by the interaction of demand and supply. But it should be remembered that demand and supply are themselves governed by a host of other factors. 'Supply and Demand' is only a superficial formula. Professor Samuelson rightly remarks: "Supply and demand are not ultimate explanations of price. They are simply useful catch-all categories for analysing and describing the multitude of forces, causes and factors impinging on price. Rather than being final answers supply and demand simply
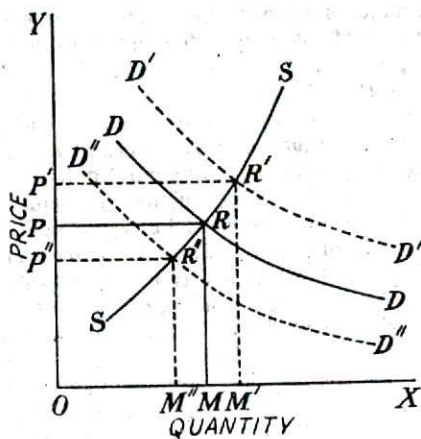
(a)

Effect of Change in Demand on Equilibrium Price
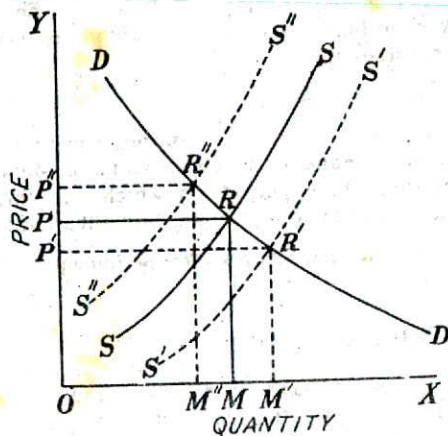
Fig. 27.2

(b)

Effect of Change in Supply on Equilibrium Price

represent initial questions. Our work is not over but just begun."[6]

For example, the cost of production is the main determinant of supply curve. A change in cost of production will change the supply curve and will thus change the equilibrium price. Similarly, the market demand for a commodity may change because the incomes of the consumers have changed or the total number of consumers have changed because of the change in the number of population.

Thus, we see that factors like cost of production, incomes of the consumers, and the size of the population, etc., take part in determining price but all of them work through either supply or demand.

In the last analysis, the firms seek to minimise costs and maximise profits. This will govern the amount of resources they will use. The resources are supplied by the households. The price of a resource will depend on the amount which the firms want in relation to the household's ability and willingness to provide the resource. The price of a good will depend on the amount which the households want in relation to the firms' willingness to produce it.

Thus, prices depend on the willingness and ability of the households to sell resources and buy goods and the firms' ability and willingness to sell goods and buy resources. The price will be established at a point where (a) the quantity of goods produced must be the same as the households want to buy and (b) the quantity of resources used must be the same as those which the households want to sell.

IMPORTANCE OF TIME ELEMENT

We have seen that the price is determined by the equilibrium between demand and supply. But Marshall, who propounded the theory that the price is determined by the interaction of demand and supply, also laid emphasis on the role of time element in the determination of price. This is so because supply conditions vary with the length of period under consideration.

Three Time-Periods

On the basis of response of supply over time to a given and permanent change in demand, Marshall distinguished three periods in which equilibrium between demand and supply was brought about:

(i) **Very short period or market period equilibrium** when supply is fixed or is limited to the existing stock on hand;

(ii) **Short-run equilibrium** when firms can expand output with the existing plants by changing the amounts of variable factors employed; and

(iii) **Long-run equilibrium** when firms can abandon old plants or build new ones and when the new firms can enter the industry or old ones can leave it.

It is on the basis of time allowed to the forces of demand and supply for mutual adjustment that Marshall talked of **market price, short-run price** or **long-run normal price.** Let us see how price changes in these time periods.

Market Period. If a sudden and once-for-all increase in demand takes place, there will be a sharp rise in market price but, there can be no change in the amount supplied, because, in the market period, firms can sell only what they have already produced, i.e., what is in stock.

Short-run Period. This period is sufficient only to make limited output adjustment with the existing equipment by expanding output along the short-run marginal cost curves. The new short-run equilibrium price will be higher than the price before the increase in demand, but not as high as the market price or very short-run price just after the increase in demand. The output will be greater in short-run equilibrium than it was before the increase in demand.

Long-run Period. In the long run, the time is long enough for the firms to change the size of their plants or build new plants. Also, new firms can enter the industry. In the long-run equilibrium, therefore, the price will be established at a lower level and output at a higher level than in the short-run position.

Thus, we see that the price that will tend to prevail in the market depends on the period under consideration. In other words, time plays an important role in the determination of price.

Which is More Important: Demand or Supply?

An important reason for introducing time element in the determination of price by Marshall was that it is thereby possible to resolve the controversy raised among economists before Marshall as to whether it is demand or supply which determines price. According to Marshall both demand and supply determine price. But, "as a general rule", said Marshall, "the shorter the period which one considers the greater must be the share of our attention which is given to the influence of demand on value; and the longer the period the more important will be the influence of cost of production on value. Actual value at any time—the market value as it is often called—is more often influenced by passing events and causes whose action is fitful and short-lived than by those which work persistently. But in the long run these fitful and irregular causes in a large measure efface one another's influence, so that in the long run persistent causes dominate values completely."[7]

Roughly speaking it can be said that in the very short run it is demand which determines price and

6.   Samuelson, P. A.—*Economics*, 1970.Edition, p. 369.

7.   Marshall—*Principles of Economics*, pp. 349-50.

in the long run it is supply which determines price. Thus, the economists who contended that price is determined by demand were right and so were those who held that price is determined by supply. Only the former were emphasising the price determination in the market, period in which cost of production has no influence on price, and the latter were stressing the price determination in the long run in which cost of production, which affects supply, has an important bearing.

But, as already pointed out, a correct scientific answer to the question whether it is demand or supply which determines price is that it is both. The above statement of either demand determining price in the market period or supply determining price in the long run is only a rough one. As it is clear from the analogy of scissors provided by Marshall from the viewpoint of scientific accuracy, fixity of supply in the market period is as much a determinant of price as the variability of demand.

Conclusion. Thus, we see that, as factors determining price, both supply and demand are important. Only their influence varies over different time periods.

Time Affects Supply

From the above analysis, one important conclusion follows that it always takes time for the supply to adjust fully to the changed conditions of demand. The reason why changes in supply conditions take time to adjust themselves to the changed demand condition is that the nature of technical conditions of production is such as to prohibit instantaneous adjustment to a changed demand condition. A period of time is required for changes to be made in the size, scale and organisation of firms as well as of the industry.

It is because of the response of supply over a period of time to a sudden and a once-for-all change in demand that economists find it useful and important to study the pricing process (a) in the market period or very short run, (b) in short run, and (c) in the long run, depending upon whether supply conditions have time to make (i) no adjustment, (ii) some adjustment of labour and other variable factors, and (iii) full adjustment of all factors and all costs.

Change in Supply Does not Necessarily Change Demand

On the other hand, the economists do not study the adjustment in demand as a consequence of the changes in supply conditions. This is because, "There is no reason why, if supply conditions change, demand conditions should change as well, or, if they do, why should they change differently in the short run and the long run. Changes in consumers' tastes are not dependent on technology

in the way that supply condition are. Admittedly consumers' tastes may, and probably will, change as time goes on. But this will be a change of data and not a change induced by changed supply conditions. Thus, there is no necessary reason why the long-run demand curve should differ from the short-run demand curve, however odd the behaviour of supply has been . . . . We must expect that the longer is the period during which demand and supply are coming into equilibrium, the more changes will have time to take place. If we were to study the changes in demand and supply which would take place, in response to any change of data, during many successive very short periods of time, we should find that we had introduced unnecessary and intolerable detail into the analysis."[8]

We shall now study how the equilibrium between demand and supply is brought about in three periods of time. In other words, we shall study the determination of:

    (i) market price,
    (ii) short-period price, and
    (iii) long-period price.

In this discussion, we shall describe the way in which the supply of a commodity adapts itself to a sudden and once-for-all change in demand for it in various periods and thus influences price.

DETERMINATION OF MARKET PRICE

Market price is determined by the equilibrium between demand and supply in a market period or very short run. The market period is a period in which the maximum that can be supplied is limited by the existing stock. The market period is so short that more cannot be produced in response to increased demand. This market period may be an hour, a day or a few days or even a few weeks depending upon the nature of the product, *i.e.*, in case of perishable commodities like fish, this market period may be a day and for a common textile industry it may be a few weeks.

What will be the nature of supply curve in a market period? Two cases are prominent—one is that of **perishable goods** and the other that of **non-perishable durable goods**, or reproducible goods.
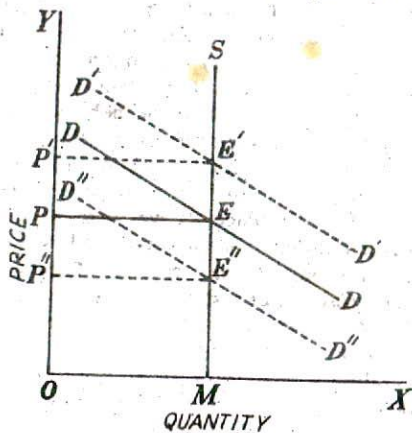
Of Perishable Goods

In the case of a perishable commodity like fish, the supply is limited by the quantity available or stock in a day and which cannot be kept back for the next period. Hence, the whole of it must be sold away on the same day, whatever may be the price.

8. Stonier and Hague—*A Text-book of Economic Theory*, 1st ed., pp. 152-53.

In Fig. 27.3, therefore, the supply curve of the fish has been shown as a vertical straight line like MS in

Market Price of Perishable Goods
Fig. 27.3

the figure, where OM is the quantity of the fish available on that day. DD is the market demand curve. With perfect competition between buyers and sellers, an equilibrium price OP (= EM) will be established at which the quantity demanded is equal to the available supply, that is, equilibrium price will be established at the point E where downward sloping demand curve DD intersects the vertical supply curve MS.

Now suppose that there is a sudden increase in demand from DD to D'D'. With the supply of fish remaining unchanged, the increased demand will raise the market price sharply from OP to OP' (= E'M). On the contrary if there is a decrease in demand from DD to D''D'', the price will fall to OP'' (= E''M). The quantity sold remains the same in all cases.

Of Reproducible Goods

In case of non-perishable but reproducible goods, the supply curve cannot be a vertical straight line throughout its length, because some of the goods can be preserved or kept back from the market, and carried over to the next market period. There will then be two critical price levels. The first, if price is very high, the seller will be prepared to sell the whole stock. The second level is set by a very low price at which the seller would not sell any amount in the present market period, but will hold back the whole stock for some better time.

Reserve Price

The price at which a seller will refuse to sell is called the reserve price. There are several factors which govern the reserve price of a seller:

(i) The reserve price will depend upon the seller's

expectations regarding the future price. If he expects a high future price, the reserve price will be higher, and *vice versa*.

(ii) The seller's liquidity preference is another determining factor. The more urgent is his need for cash, the lower will be the reserve price.

(iii) The reserve price also depends on the charges which have to be incurred for carrying stocks. The period for which the stocks have to be held is, therefore, important. The longer is the period the lower will be the reserve price.

(iv) It also depends upon the future costs. If the costs are expected to fall, the reserve price will be lower, and *vice versa*.

(v) The reserve price will also depend upon the durability of goods; the greater the durability, the higher is the reserve price.

(vi) Some obstinate dealers attach too much importance to costs incurred in the past and fix a high reserve price even though it may lead them to a greater loss.

Given the two extreme price levels, one at which the seller is prepared to sell the whole stock and the other at which he will refuse to sell any, the amount which he will offer for sale will vary with price. Given his anticipations of future price and intensity of his need for cash, *etc.*, he will be prepared to supply more at a higher price than at a lower one. The supply curve of a seller will, therefore, slope upwards to the right. Beyond a price at which he is prepared to sell the whole stock, the supply curve will be a vertical straight line whatever the price. Similar analysis will apply to each of the sellers.

There is an additional reason for the total market supply curve to slope upwards in some of its portion. This is that the reserve price will be different for different sellers. At a given price, some of the sellers will be prepared to sell while others will hold back, and, at a higher price, some more sellers will offer the output for sale. At a very high price, all sellers may be prepared to supply the whole stock of the product, and, at a very low price, all may refuse to sell.

In Figure 27.4 SRFS is the supply curve of the durable goods while OQ is the total amount of the stock of the goods. Up to the price OP' (= QF), the quantity supplied varies with price so that at a higher price more is supplied than at a lower one. At the price OS, nothing is sold, the whole stock being held back. Therefore, SF portion of the supply curve slopes upwards from left to right. At the price OP' (= QF), the whole of the stock is offered for sale, and beyond OP', the quantity supplied remains the same whatever the price. Therefore, beyond price OP', the market supply curve has been shown as a vertical straight line. DD is the demand curve which slopes downwards from left to right.

Market price determined is OP (= RM) as at this

price quantity demanded is equal to the quantity supplied since the demand curve DD and the supply curve SF intersect at the point R. At this equilibrium
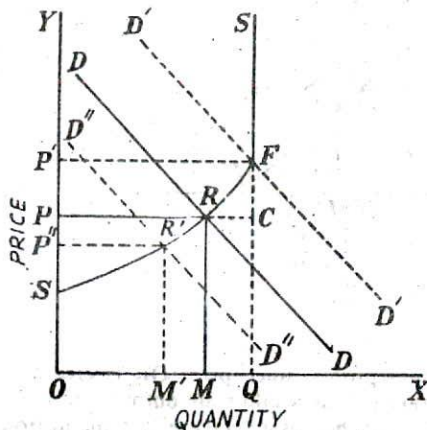
Market Price of Durable Commodity
Fig. 27.4

price OP (=RM), OM amount from the stock is sold, while the rest of the stock, i.e., MQ (=RC) is held back from the market.

If now the demand increases from DD to D′D′, the price will rise to OP′ (=QF) and the whole stock OQ will be sold. In case, the demand further increases from D′D′ to some higher level, the quantity supplied or sold will remain the same, i.e., equal to OQ, which is the entire stock, only the price will rise so that at the new equilibrium level quantity demanded is equal to the available supply.

If, however, the demand decreases from DD to D″D″, the price will fall to OP″ (R′M′) and the amount sold will fall to OM′.

Since in a perfectly competitive market, the product is homogeneous and no buyer has any preference for a particular seller, therefore, a single uniform market price will be established in the market. Once the market price is determined, an individual seller in the market will take the price as given and constant, and sell any quantity he likes. Hence, the demand curve, which is downward sloping for all sellers, is a horizontal straight line, i.e., perfectly elastic at the level of ruling market price for a single seller.

Thus, a single seller, under perfect competition, can dispose of his entire output at the ruling market price, there is no reason why he should lower his price even though his reserve price may be less than the ruling market price. If his reserve price is above the market price, he will not be able to sell anything, because demand for him is perfectly elastic.

Costs Do Not Affect Market Price

One important conclusion that follows from the

above analysis of price determination in the market period is that costs of production do not enter into the calculation of the sellers and, therefore, costs have no influence on the market price. For example, if the market price 'today' is below the cost of production but the seller expects further fall 'tomorrow', he will try to dispose of the stock today. On the other hand, he would not be inclined to sell his stock even at a price above cost 'today', if he expects the price to rise still higher 'tomorrow'.

The costs of production have influence only when the amount supplied can be varied. The costs, therefore, enter into calculations in the short run as well as in the long run. In the market period, only the output which has already been produced can be offered for sale and, therefore, the question of increasing or decreasing output does not arise. Hence, costs of production are no consideration in deciding the amount to be offered for sale.

Price as a Rationing Device

We shall discuss more fully later the role of prices in a modern economy. We may only say here that price is a signal to the producers to expand or contract production and a warning to the consumers as to the possible shortage of the commodity or signal to the possible glut. Also, price reflects marginal social value of the commodity. But the function that we see price performing here is of a rationing device. In a market period (i.e., a very short period), the supply is fixed. Price, therefore, rations or distributes the available supply among the consumers who are willing and able to pay the price equal to, or more than, the equilibrium price.

DETERMINATION OF SHORT-RUN PRICE

In a preceding chapter, we explained that in the short run a firm is in equilibrium at the output at which price equals marginal cost. It was also pointed out that, during the short run, fixed costs are disregarded in making a decision whether to produce or not. It is the average variable cost rather than average total cost which is of determining importance to decide whether to produce or not. If the price falls below the minimum average variable cost, then even in the short run firms will shut down to minimise losses.

Thus, the minimum average variable cost sets a minimum limit to the price in the short run since at a price below it no amount of output will be produced. We also pointed out that short-run supply curve of the industry is the lateral summation of the short-run marginal cost curves of the firms. The supply curve of the industry lies above the minimum average variable costs. The short-run supply curve

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9. Chapter 32.
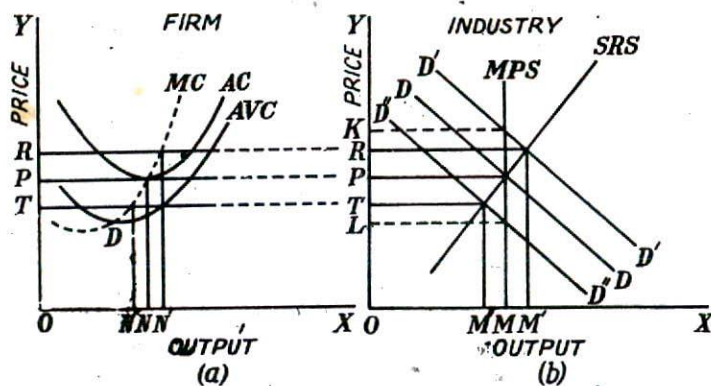
Determination of Short-run Price
Fig. 27.5

of the industry slopes upward from left to right since the short-run marginal cost curve of the firms slopes upwards too.

The determination of the short-run price can be explained with the help of the Fig. 27.5. DD in the Fig. 27.5 (b) is the demand curve facing the industry. This demand curve as usual slopes downwards from left to right. MPS is the market period supply curve (its vertical shape shows that it is fixed) and SRS is the short-run supply curve of the industry. If there is an increase in demand from DD to D'D', the market price will rise sharply from OP to OK at which level the new demand curve D'D' intersects the market period supply curve MPS, supply of output remaining unchanged.

But, under the stimulus of this increased demand, the firms will increase their production in the short period, by making intensive use of the fixed capital equipment and increasing the amount of variable factors. It should be borne in mind that, in the short period, no change in the fixed capital equipment can be made, nor can new firms enter the industry. The supply of the commodity will increase as a result of the expansion of output by the firms, using more variable factors, in response to increase in demand. Hence, in the short run price will fall to OR at which new demand curve D'D' intersects the short-run supply curve SRS.

Thus, OR is the short-run normal price which is higher than the original market price OP but not as high as the second market price of OK. The quantity supplied has also increased from OM to OM'. Hence, in the short run, a larger amount of the quantity is sold and the price is not quite as high as in the market period.

Given the demand curve D'D', the short-run normal price OR is established in the market. Individual firms will take this price as given and constant and will adjust their output level so that the price equals marginal cost. From Fig. 27.5 (a), it is clear that, at price OR, the firm is making super-

normal profits, since price OR is greater than the average cost at equilibrium output ON'.

Now, if there is a decrease in demand from DD to D''D'', the market price will fall sharply from OP to OL at which level demand curve D''D'' intersects the MPS curve, the supply of the output remaining the same. But, in the short run, firms will contract output by diminishing the variable factors and, as a result, the quantity supplied will decrease. The short-run normal price will be OT at which short-run supply curve SRS intersects the new demand curve D''D''.

Thus, short-run price OT will be higher than the new market price OL but will be lower than the original market price OP. Again, OT, the new short-run price, will be taken as given and constant by the firms and they will adjust their output at which OT equals marginal cost. It will be seen from Fig. 27.5 (a) that at price OT firms would be incurring losses. Price cannot fall below the point D since at prices below D firms would not produce any amount of the commodity and the quantity supplied will be zero.

DETERMINATION OF LONG-RUN NORMAL PRICE

Market price may fluctuate owing to a sudden change either on the side of supply or on that of demand. A big arrival of fish, for instance, may depress its price in a particular market. A sudden heat wave may raise the price of ice. These are, however, temporary influences and cause temporary disturbances in the market price. In the absence of such disturbing causes, the price tends to come back to a certain level. This level itself may not be a fixed point for all times. But if the techniques and scale of production remain on the whole constant, this level may be taken as a fixed anchor around which, in its day-to-day movements, market price oscillates.

Adam Smith called this level "natural" price and Marshall called it "normal" price. In the words of

Marshall, " 'Normal' or 'Natural' value of a commodity is that which economic forces would tend to bring about in the long run." It is probably worth pointing out that " 'normal' prices are not the same thing as 'average' prices unless prices are constant. Normal prices are those prices to which one may expect the actual prices to tend. They will not only be influenced by fortuitous fluctuations and oscillations, but will also take account of the general trend towards the 'normal' price."[10]

In order to describe how long-run equilibrium is brought about and thus normal price is determined, it is useful to refer to the market period and short-run period also. As we have stated above, the market period is so short that no adjustment in the output can be made. There is a given amount of the stock of the goods on hand, and, in case of perishable goods, the whole of it must be sold at whatever price the market will fetch. In the market period or very short run, costs of production have no influence on price.

The short-run period, however, is sufficient to allow the firms to make limited output adjustment. If there is an increase in demand, the firms will expand output, by more intensive use of the fixed capital equipment and by greater use of the variable factors, to the point where new price equals marginal cost. As shown above, the new short-run price will be higher than the price before the increase in demand but not as high as the market price, and the output will be greater.

In the long period, the supply conditions are fully adapted to meet the new demand conditions. If there is a sudden and once-for-all increase in demand, the firms in the long run will expand output by increasing the use of variable as well as of the fixed factors of production. They may enlarge their old plants or build new plants. Moreover, in the long run, new firms can also enter the industry and thus add to the supplies of the product.

In the long period, average variable cost is of no particular relevance, since, in the long run, all factors are variable and none fixed. In this period, all costs ever incurred by the firm must be covered, and hence all are price-determining. Price, in the long run, or normal price, under perfect competition, therefore, must be equal to the minimum long-run average cost.

In a previous chapter (No. 25), we explained that a firm under perfect competition is in long-run equilibrium at the output where Price = MC = minimum LAC. Fig. 27.6 shows that price OP = LMC = LAC. If the price is above the minimum long-run average cost, the firms will be making supernormal profits. Therefore, in the long run, new firms

10. Stonier and Hague—A Text-book of Economic Theory, Ist ed., pp. 160.

will enter the industry to compete away these extra profits and the price will fall to the level where it is equal to the minimum long-run average cost. Neither can the price fall below the minimum
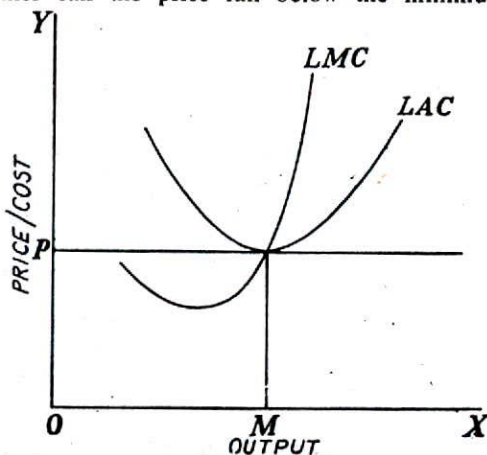
Long-run Normal Price = Long-run Minimum Average Cost
Fig. 27.6

average cost since in that case the firms will be incurring losses. In long run, if these losses persist, some of the firms will leave the industry. As a result, the price will rise to the level of minimum average cost, so that in the long run firms are earning only normal profits.

Thus, we see that if the price is above or below the minimum long-run average cost, adjustment takes place in the output primarily by the entry of new firms or exit of some existing firms so that new price once more equals the minimum average cost.

But whether this long-run minimum average cost is equal to or is higher or lower than the previous one will depend on whether the industry in question is subject to the law of constant cost, increasing cost or decreasing cost. How the normal price is determined under conditions of increasing cost, constant cost or decreasing cost is explained below.

Long-run Normal Price in Increasing-Cost Industry

As we explained in the previous chapter, supply curve of an increasing-cost industry slopes upwards from left to right. This is so because when a full-sized industry expands as a result of the increased demand for its product, it experiences certain external economies and diseconomies. But external diseconomies in the case of an increasing-cost industry outweigh the external economies and this brings about an upward shift in the cost curves of all firms. When the industry expands, the costs rise primarily due to the intensive bidding of the prices of specialised labour and raw materials by new firms. As already explained, the increasing-cost
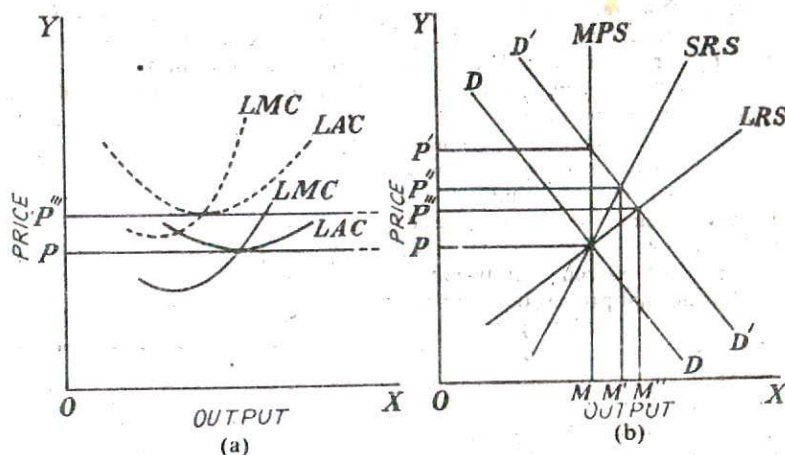
Long-run Normal Price in Increasing-cost Industry
Fig. 27.7

industry is the most typical of the actual competitive world.

The whole pricing process in the increasing-cost industry can be explained with reference to Fig. 27.7. In Fig. 27.7 (b), LRS is the long-run supply curve of the increasing-cost industry. MPS is the market period supply curve and SRS the short-run supply curve. To begin with, DD is the market demand curve and OP is the market price. Now suppose that there is a sudden and once-for-all increase in demand from DD to D'D'. In the market period or very short run, the firms can sell only what they have already produced. The total amount supplied will remain unchanged at output OM. Thus, as a result of increase in demand from DD to D'D', the market price will rise sharply from OP to OP', because the new demand curve D'D' intersects the market period supply curve MPS at OP' level.

In the short run, however, the firms will increase output OM to OM' along the short run marginal cost curve. Therefore, the price in the short run will fall to the level OP'' at which the new demand curve D'D' intersects the short-run supply curve SRS, which is the lateral summation of the short-run marginal cost curves of the firms. In this short-run equilibrium, every firm will be producing output for which the price OP'' is equal to short-run marginal cost. In this short-run equilibrium position, firms would be earning supernormal profits, because the price OP'' is above the LAC (long-run average cost). [See Fig. 27.7 (a)].

Lured by these supernormal profits, new firms will enter into the industry in the long run. But since we are dealing with the increasing-cost industry, as the new firms enter, the cost curves of all the firms will shift upwards due to the **net external** diseconomies. As the output of the industry increases OM to

OM'' as a result of the entry of new firms, price in the long run will fall to OP''' at which the demand curve D'D' intersects the long-run supply curve LRS. Thus, OP''' is the long-run normal price.

This long-run normal price OP''' must be equal to the minimum long-run average cost since new firms will continue entering the industry until all firms are earning only normal profits. But this new minimum average cost [shown by the dotted curve in Fig. 27.7 (a)] in the case of increasing-cost industry will be higher than the initial minimum average cost, because costs have risen due to the entry of new firms in the industry. Therefore, the price of OP''' will be higher than the initial price OP. All this is clear from the Fig. 27.7.

From the above, it is clear that, in the long run, in the case of increasing-cost industry, more quantity of the output can be got only at a rather higher price. The extent to which the long-run price differs from the original price depends on the extent of increase in costs following the expansion of the industry. It must be carefully noted that each point on the long-run supply curve of the industry LRS represents a long-run equilibrium as the demand shifts to the right inducing ultimately the expansion of the industry, with more firms each with higher cost curves.

Long-run Normal Price in Constant-Cost Industry

We explained in the preceding chapter that industry will be a constant-cost industry if, on its expansion, external economies and diseconomies cancel each other so that the constituent firms of an enlarged industry do not experience shift in their cost curves. An industry can also be a constant-cost industry if its expansion breeds neither external economies nor external diseconomies. It was also
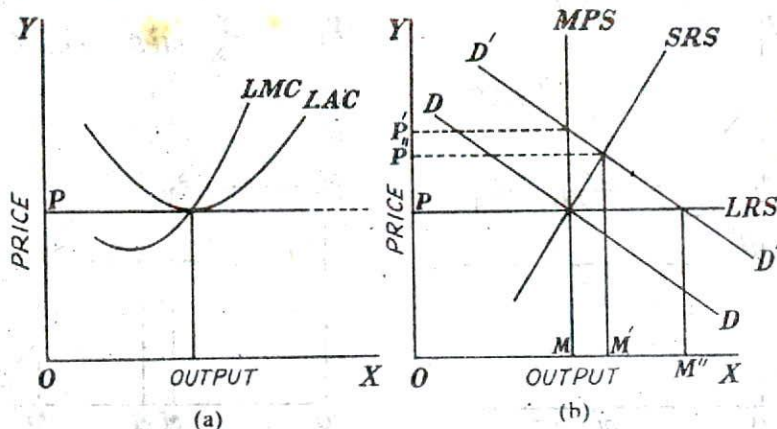
Long-run Normal Price in Constant-Cost Industry
Fig. 27.8

pointed out in the preceding chapter that the long-run supply curve of the constant-cost industry is a horizontal straight line or perfectly elastic at the level of long-run minimum average cost, i.e., the bottom of the U-shaped LAC.

The pricing process in a constant-cost industry can be explained with the aid of Fig. 27.8. To begin with, DD is the demand curve and it intersects the market period supply curve MPS at price level OP. Thus, OP is the market price.

Now if the demand increases to D'D', there will be a sharp rise in the market price from OP to OP' where the new demand curve cuts the Market Supply Curve (MPS), the supply remaining unchanged. In response to the increased demand, the firms in the short run will increase production. Therefore, in the short-run equilibrium, price will fall to OP'' at which the short-run supply curve SRS intersects the new demand curve D'D'.

In the long run, the output will increase further and the price will fall to the original level. In the case of a constant-cost industry, the new long-run normal price will be the same as the original equilibrium price OP. The output of the industry, in this new long-run equilibrium, will be OM''. Every firm in the long run will be producing at the long-run minimum average cost as in the original equilibrium position and will be earning only normal profits.

Thus, we see that, in this constant-cost case, an increase or decrease in demand will, in the long run, simply change output by changing the number of firms. It will have no effect on price in the long run or on the scale and costs of each firm that stays in the industry since each firm under perfect competition is always forced to the bottom of U-shaped LAC curve and no shift takes place in cost curves in the constant-cost industry.

Long-run Normal Price in Decreasing-Cost Industry

As already pointed out in the preceding chapter, in the case of a young industry in its early stages of growth, the external economies may overweigh the external diseconomies. This phenomenon of net external economies lowers the cost curves of all firms.

The external economies, which may be available when the industry grows in size, arise because: (a) cheaper and better trained labour becomes available; (b) better information centres and markets are created; (c) productivity of factors in one firm is enhanced by expanded production in others; (d) raw material produced at decreasing costs by other specialized industries are made available at reduced prices; (e) cheap credit becomes available; and (f) there is the benefit of specialized transport.

The presence of the net external economies will lower the cost curve of all firms and, therefore, the industry will experience the phenomenon of decreasing costs as it expands by the entry of new firms.

Thus, in the case of a decreasing-cost industry, the additional supplies of the product will be forthcoming at reduced costs and, therefore, the long-run supply curve of the industry will slope downwards from left to right.

The determination of normal price in the case of a decreasing cost industry can be explained with the help of Fig. 27.9 where LRS is the long-run supply curve of the decreasing-cost industry.

To begin with, DD is the demand curve which intersects the market period supply curve MPS at price OP. Therefore, OP is the market price. Now suppose that there is a sudden and permanent change in demand from DD to D'D'. As a result of
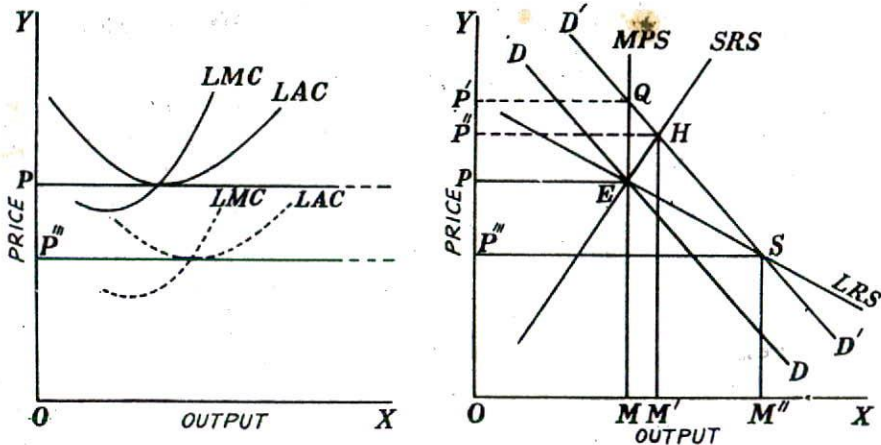
Long-run Normal Price in Decreasing-Cost Industry
Fig. 27.9

this increased demand, the market price will rise sharply to OP′, output remaining the same.

In the short run, the firms will increase output and, therefore, amount supplied will increase. As a result, the price in the short run will fall to OP′′, at which the new demand curve D′D′ intersects the short-run supply curve SRS.

In the long run, however, new firms will enter the industry and cause a downward shift in the cost curves of all the firms. The new long-run price will be determined at the level OP′′′ at which new demand curve D′D′ cuts the downward sloping long-run supply curve LRS. In this new long-run equilibrium, more will be produced and supplied at a lower price than in the original equilibrium position. Whereas in the original equilibrium position, OM amount of the product is produced and supplied at price OP, in the new long-run equilibrium position, a larger amount OM′′ is produced and supplied at a lower price OP′′′. Thus, in the long-run, larger supplies of the product will be forthcoming at reduced prices.

Therefore, we conclude that, in the case of a decreasing-cost industry, an increased demand for its products will, in the long run, lower the price and increase the quantity supplied.

Conclusion. From the above discussion, it is clear that, as demand increases, the long-run normal price increases, remains the same, or decreases depending on whether the industry in question is an increasing-cost, constant-cost or decreasing-cost industry.

Decreasing-Cost Industry is Incompatible with Perfect Competition

In case of a decreasing-cost industry, even if there is competition to start with, competition will gradually disappear resulting in a monopoly or oligopoly (a few monopolists). Suppose initially

there is a large number of firms in the industry. There will be a tendency for them to expand to take advantage of economies of scale, resulting in lower and lower average costs as the scale of output is enlarged. But all firms are not equally efficient and quick enough to realise the economies of scale. Those who are left behind in the race have ultimately to drop out. Bigger firms keep driving down the prices, till only a few survive, resulting in an oligopoly, or only one firm survives, and a monopoly is established.

Figure 27.10 illustrates this. We see here that
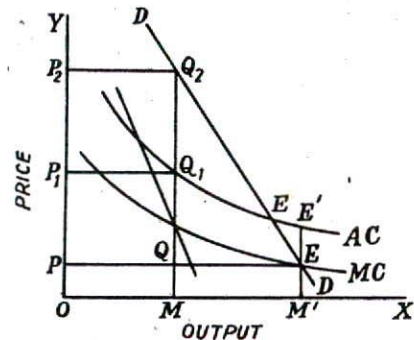
Decreasing-Cost Industry and
Competition
Fig. 27.10

average cost curve AC declines very sharply up to its point of intersection with the demand curve DD. The marginal cost curve MC lies below AC over this range of output. MC cuts DD at E where price EM′ is lower than average cost E′M′. At this point, total cost (OM′×E′M′) exceeds total revenue (OM′×EM′), therefore, losses are incurred. But few firms will have the endurance to reach this point. Long before, most of them would have dropped out. The survivor, the monopolist, would

restrict output to OM and charge OP_2 ($= MQ_2$) price, and make a handsome profit of $P_1Q_1Q_2P_2$, which is measured by the excess of total revenue ($OM \times OP_2$) over ($OM \times OP_1$).

If the shape of AC were such that after declining, it remained constant over a large part of the output, it will permit a fair number of firms to continue and an oligopoly will be the result.

Normal Price and Market Price Compared

We have already discussed what is meant by the market price and the normal price and how they are determined under conditions of perfect competition. We are now in a position to make comparison between them in some detail:

(i) While market price is determined by the temporary equilibrium between the forces of demand and supply at a particular time, normal price is the result of the long-run equilibrium between demand and supply, when the supply conditions have fully adjusted themselves to the given demand conditions.

(ii) Market price may actually be reached at a given moment or day as a result of a temporary equilibrium. But the long-run normal price may, in practice, never be reached. There will usually be a change in either the demand or supply conditions underlying the long-run equilibrium before it has had time to come into being. The long run—like tomorrow—never comes.

(iii) Market price is governed by temporary causes and passing events, whereas normal price is influenced by permanent and persistent causes. For, in the long run, temporary causes disappear or neutralize one another. Market price, therefore, fluctuates from day to day due to a temporary change either on the side of demand or that of supply. Normal price, on the other hand, remains the same under given permanent conditions of demand and supply. Normal price is the centre round which the market price oscillates or it is the level to which it tends to return after having departed from it temporarily.

But it should be remembered that this normal price is not a fixed level. For example, if there is a permanent change in the demand conditions, the normal price will change. In the determination of normal price, under increasing-cost industry in Fig. 27.7 (b) (which we reproduce here also as Fig. 27.11), we saw that, when there was a permanent change in demand from DD to D'D', the normal price increased from OP to OP'''.

But it must be understood that given the D'D' and LRS as permanent conditions of demand and supply respectively, the market price will fluctuate around the new normal price OP''', owing to temporary changes in demand and supply. Before the permanent increase in demand from DD to

D'D', the market price fluctuated around the original equilibrium price OP. In fact, what we studied was the movement from one long-run equilibrium position or normal price to another. As
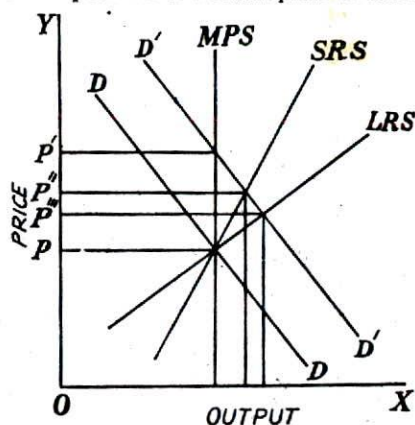
Market Price Fluctuating Round Normal Price
Fig. 27.11

a result of the sudden and permanent change in the demand from DD to D'D', there is a sharp rise in the market price from OP to OP', but, in the long run, the price will fall to OP''', the new long-run normal price.

As already mentioned, every point on the long-run supply curve LRS with the corresponding demand curve represents a long-run equilibrium position and hence normal price. We saw that when there is a permanent increase in demand, in the case of increasing-cost industry, the normal price increases; and, in the case of constant-cost industry, the normal price remains the same; and in the case of decreasing-cost industry, the normal price decreases.

It should be further noted that even long-run supply curve LRS can alter if there is a fundamental change in technical conditions of production. If there is a fundamental improvement in the technical know-how, the long-run supply curve LRS will shift downwards and there will be a new normal price corresponding to given demand curves.

(iv) Since in the market period, the quantity of the output cannot be varied, the cost of production has no influence on market price, the market price may be above or below the marginal and average cost of production, depending upon the demand conditions. If, in the market period, the demand is relatively greater than supply, the market price may be established at the level well above both the marginal and average cost of production. But the long-run normal price must be equal to both the marginal cost and the minimum long-run average cost.

(v) All commodities have a market price but only reproducible commodities can have a normal price.

If commodities cannot be produced at all, their supply is fixed for all time. If the output of a commodity cannot be varied in response to changes in demand, there is no sense in speaking of their normal price. Such commodities may be pictures of old masters, unique diamonds, old manuscripts, *etc.* These commodities have a market price, but no normal price.

PRICE DETERMINATION UNDER PERFECT COMPETITION SUMMED UP

We may now sum up the theory of price determination under perfect competition in the following propositions:—

We repeat that perfect competition assumes that (a) the firms in the industry are of a small size but large in number, (b) their products are homogeneous or identical, (c) that all productive resources are perfectly mobile as between uses and places, and (d) consumers, producers and resource owners possess perfect knowledge.

(1) Price is determined by the interaction of the forces of demand and supply. **Equilibrium price** is established at the level at which demand curve intersects the supply curve, or at which the quantity demanded is equal to the quantity supplied. At any price higher than the equilibrium price, the quantity supplied will exceed the quantity demanded; competition between sellers will force the price down to the equilibrium level. Similarly, at any price lower than the equilibrium one, the quantity demanded will be greater than the quantity supplied; competition between buyers will push the price up to the equilibrium level.

(2) The element of time plays an important role in the determination of price. On the basis of the response of supply over time to a given and once-for-all change in demand, Marshall distinguished equilibrium between demand and supply in three periods: (a) Very short run or momentary equilibrium when supply is fixed or limited by the total stock on hand; (b) short-run equilibrium when output can be varied within given fixed plants and firms; (c) long-run equilibrium when both the size of the plants and number of the firms can adjust themselves to the new level of demand.

(3) Market price is the result of momentary equilibrium between demand and supply. This period is so short that the output cannot be varied in response to changes in demand. The firms can sell only what they have already produced. In case of perishable commodities like fish, the whole stock must be sold whatever the price, and, therefore, the supply curve is a vertical straight line throughout its length. However, in the case of durable goods, some part of the stock may be held back from the market in the hope of getting higher price in future. Therefore, in the case of durable goods, supply curve in part of its length slopes upwards to the right but runs vertical beyond a price at which the whole stock of the goods is offered for sale. An important point to note about market price is that demand plays a predominant part in its determination and cost of production has no influence on price whatsoever.

(4) Short-run price is the result of the equilibrium between a given demand curve and the short-run supply curve, firms having been given enough time to expand output only along short-run marginal cost curves. In the short run, price must equal marginal cost of production. But at this point, profit may be supernormal, normal or subnormal depending upon the demand conditions. The short-run price, however, cannot fall below the minimum average variable cost, and, therefore, losses cannot be greater than the fixed cost (why?).

(5) Long-run or normal price is the result of equilibrium between a given demand curve and the long-run supply curve, supply conditions having been fully adjusted to the given demand condition. Long-run or normal price must be equal to minimum long-run average cost (why?). But whether this long-run minimum average cost increases, remains constant or decreases as the industry expands by the entry of new firms, depends upon whether the industry in question is an increasing-cost, constant-cost or decreasing-cost industry respectively.

(6) If there are net external diseconomies as the industry grows in size, it will be a case of increasing-cost industry. When the increasing-cost industry expands in response to a given and once-for-all increase in demand, the new long-run or normal price will be higher than that before such increase in demand.

(7) If in the case of an industry, neither external economies nor external diseconomies arise when it expands or if they do arise they cancel each other, then it will be a constant-cost industry. In this constant-cost case, an increase or decrease in demand will, in the long run, simply change output by changing the number of firms and will have no effect on the long-run or normal price, which will remain the same whatever the demand.

(8) It is conceivable that an industry in its early stages of growth may enjoy net external economies when it grows in size. Such a case will be one of a decreasing-cost industry. In this case, as the industry expands in response to a given and once-for-all increase in demand, new long-run or normal price will be lower than that before the increase in demand.

28 · PRICE-OUTPUT UNDER MONOPOLY

In the preceding chapters, we studied the conditions of equilibrium under perfect competition. We have also seen how price and output are determined in a perfectly competitive industry. We shall now study price-output determination under imperfect competition which may take the form of a monopoly, monopolistic competition or oligopoly. The present chapter will deal with monopoly.

Meaning of Monopoly

As already mentioned in Chapter 22, **the monopoly is that market form in which a single producer controls the whole supply of a single commodity which has no close substitutes.**

Two points should be noted in regard to this definition: First, there must be single producer or seller, if there is to be a monopoly. The single producer may be an individual owner or a group of partners or a joint-stock company or any other combination of producers or the state. If there are many producers, there will be competition, perfect or monopolistic, and, if there are a few producers, we face oligopoly. Hence, there must be a sole producer or seller in the market, if it is to be called a monopoly. Since there is only one firm under monopoly, that single firm constitutes the whole industry. Therefore, **the distinction between the firm and industry disappears under conditions of monopoly.**

Secondly, the commodity produced by the producer must have no closely competing substitutes, if he is to be called a monopolist. This ensures that there must not be any rival of the monopolist. By the absence of close substitutes we mean that there are no other firms producing similar product or products varying only slightly from that of the monopolist. The producer of the 'Lux', for instance, cannot be called a monopolist as there are other varieties of soap like Rexona, Breeze, Hamam, Sunlight, *etc.*, which closely compete with Lux in the market. But there are no close substitutes for electricity and water supplied by the local public utilities. These local public utilities thus provide economists with the examples of a monopoly.

We can also express this second condition of monopoly in terms of cross-elasticity of demand. As we have seen in an earlier chapter (No. 11), cross-elasticity of demand shows a change in the demand for a commodity as a result of change in the price of another commodity. If there is to be monopoly, **the cross-elasticity of demand between the product of the monopolist and the product of any other producer must be very low.**

The above two conditions ensure that the monopolist can set the price of his product and can pursue an independent price policy. **Power to influence price is the very essence of monopoly.** From this it must not be gathered that the monopolist is so powerful that he can dictate the price as well as the amount sold. Monopolist can do one of these things only; either he can fix the price leaving the amount sold to the consumers, or he can fix the quantity he wants to produce and sell and leave the price to be determined by the demand of the consumers.

Bases of Monopoly: Barriers to the Entry of Rivals

It is noteworthy that monopoly can exist only when there are strong barriers to the entry of rivals. In general, the persistence of profits above the normal shows the lack of freedom of entry of other firms. The monopolist can maintain his position as the sole producer or seller of a product only when certain circumstances keep the rivals away from his line of production. These barriers also explain the existence of oligopoly. But in the case of a monopoly, the barriers to entry are so great and strong that they block all other producers from entering in the field of production of the monopolist.

Barriers are of two types: (a) First type of barriers are **economic in nature.** In a given industry or in a

given area, the consumers can best be served by a single firm and it is not profitable for other firms to enter the field of the monopolist. The total market is not big enough to permit even one firm to operate at the optimal scale of output. Until a firm reaches this optimal scale, it is operating in its range of **"decreasing costs."** That is, by increasing output it can cut its cost per unit produced. Such reductions in costs are described as the **"economies of large-scale production"**.

If the market in an industry is not big enough to support even one big optimum-sized firm, it is reasonable to assume that there will be established a monopoly of the existing firm, which is still enjoying economies of scale and, therefore, working in the range of 'decreasing costs'. This is so because new firms, if they were to enter the market as small-scale producers, will have little or no chance to survive and expand. These small-scale entrants will be unable to realise the cost economies enjoyed by the existing big firm and will not be able to compete with it. The other option for the new entrants is to start big, that is, to enter the industry as a large-scale producer. In practice, this is virtually impossible. Apart from other handicaps for a new and untried enterprise, the financial obstacles in the way of starting big are so great in many cases as to be prohibitive. The automobile, aluminium and steel industries reflect such conditions of the economies of scale, and, in these industries, monopolies or at least oligopolies are generally to be found.

In some industries, economies of scale are so particularly pronounced that competition is imprac- tical, inconvenient or simply unworkable. Such industries are called **natural monopolies,** and most of the so-called public utilities—the electric and gas companies, bus and railway companies, water and communication facilities—can be so classified. These industries are generally given exclusive rights by the governments. But in return for this sole right to supply electricity, water or bus service in a given geographic area, Government reserves the right to regulate the operations of such monopolies to prevent abuses of the monopoly power it has granted.

(b) The second type of barrier to entry is institu- tional or else artificial in nature. Thus

(i) A firm may enjoy the **exclusive ownership or control of the raw materials** which are absolutely essential in making the product, and prohibiting the creation of rival firms.

(ii) By granting an inventor the exclusive right to control a product for some years, patent laws protect an inventor from the competition of rivals.

(iii) The entry of new competitors may be blocked or the rivals may be eliminated by aggres- sive cut-throat tactics of the monopolist. Familiar ing techniques are: aggressive price-cutting

designed to make the competitors bankrupt, dispar- agement of the product, pressure on banks not to grant credit and pressure on resource suppliers to withhold materials, spurious and exhausting law suits, the luring away of strategic personnel and spying and sabotage.

The above-listed barriers to entry are seldom effective cent per cent and, therefore, monopoly is a rare phenomenon. With these points in mind, let us analyse how price-output equilibrium is established in case of a monopoly.

PRICE-OUTPUT DETERMINATION UNDER MONOPOLY

Price-output analysis in the case of a monopoly is also an analysis of the equilibrium of the firm and industry under monopoly.

Since in a monopoly, a single firm constitutes the whole industry, there is no need for a separate analysis of the equilibrium of the firm and of the industry, as is done in case of perfect competition. Also, the price-output equilibrium of the firm will mean the price and output determination under monopoly.

In the discussion of perfect competition (Chapter 22), we saw that the demand curve or the average revenue curve faced by a perfectly competitive firm is perfectly elastic and is represented by a horizontal straight line parallel to the X-axis. This is so because a producer under perfect competition cannot affect price by his own individual action. He has to accept the ruling market price as given and constant, and at this price, he can sell any quantity of the commodi- ty.

But this is not true in the case of a monopoly. A firm under monopoly faces a downward sloping demand curve or average revenue (AR) curve. Therefore, if the monopolist lowers the price of his product, the quantity demanded increases, and, if he raises the price, the quantity demanded decreases. In other words, if the monopolist wants to sell a larger output, he has to reduce the price of his product. In that way, it is not only the price of the additional units that falls but the price of his total output goes down. Since his output affects the price at which he can sell, price is not a given factor for him as it is for the man producing under perfect competition.

Further, in perfect competition, since the average revenue curve is perfectly elastic and a horizontal straight line to the X-axis, the marginal revenue is always equal to the average revenue, *i.e.*, the mar- ginal revenue curve coincides with the average revenue curve. But unlike this, in a monopoly, since average revenue falls as more units of output are produced and sold, the marginal revenue is always less than the average revenue. In other words, under monopoly the marginal revenue curve lies below the average revenue curve.

From the above analysis, it follows that even the monopolist is not free of the market forces in establishing his price. The monopolist cannot set his price high without losing sales, nor can he gain sales without charging a lower price. The question now arises: which particular price-output combination on his demand curve will the monopolist choose? This depends not only on the demand conditions but also on the cost situation faced by the monopolist.

On the cost side of the picture, as in perfect competition, the average cost curve is generally U-shaped. Marginal cost curve, as elsewhere, cuts the average cost curve at its minimum point.

Equating Marginal Revenue and Marginal Cost

The aim of the monopolist, like every other producer, is to maximize his total money profits. Therefore, he will produce up to a point and charge a price which gives him the maximum money profits. In other words, he will be in equilibrium at that price-output level at which his profits are the maximum. He will go on producing so long as additional units add more to the revenue than to the cost. He will stop at that point beyond which additional units of production add more to cost than to revenue. In other words, he will be in equilibrium position at that level of output at which marginal revenue equals marginal cost. That is, he will continue producing so long as marginal revenue exceeds marginal cost. He does so because profits will go on increasing as long as the marginal revenue exceeds the marginal cost. At the point where marginal revenue is equal to marginal cost, the profits will be maximised, and here he stops. If the production is carried beyond this point profits will start decreasing.

The price-output equilibrium of the monopolist can be easily understood from diagram No. 28.1. AR is the demand curve or average revenue curve facing the monopolist. MR is the marginal revenue curve which lies below the average revenue curve AR. AC is the average cost curve and MC is the marginal cost curve. It can be seen from the diagram that uptill OM output, marginal revenue is greater than marginal cost but beyond OM the marginal revenue is less than marginal cost. Therefore, the monopolist will be in equilibrium at the output OM, where marginal revenue is equal to marginal cost and profits are the greatest. The price at which output OM is sold in the market can be known from looking at demand or average revenue curve AR. It can be seen from the diagram that corresponding to equilibrium output OM, the price on the demand or average revenue curve is MP' (=OP). Thus, it is clear that, given the cost-revenue situation as presented in Fig. 28.1, the monopolist firm will be in equilibrium at the output OM and will be charging price equal to MP' (=OP).
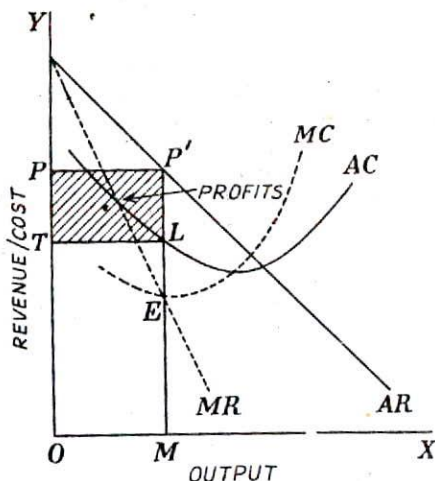
*Price-Output Equilibrium
Under Monopoly*
Fig. 28.1

Now the question is: what amount of actual total profits—although maximum they would be in the given cost-revenue situation—will be earned by the monopolist in this equilibrium position? This can be known in the following way:

At output OM, while MP' is the average revenue, ML is the average cost (being on the AC curve). Then, P'L is the profit per unit.

Now the total profits = Profits per unit × total output sold

$$= P'L \times OM$$
$$= P'L \times TL$$
$$= P'LTP$$

Thus, the total profits earned by the monopolist in the equilibrium position are equal to the rectangle P'LTP, i.e., the shaded area.

Monopoly Price and Elasticity of Demand

A very important point about the equilibrium position of the monopolist is worth mentioning. It is that the equilibrium of the monopolist will always lie at that level of output where the elasticity of demand for his product is greater than one, provided that his costs are positive. In other words, monopolist will never fix the output of his product at any level where the elasticity of his average revenue curve is less than one. If he were to do so, it would be possible for him to increase his total profits by decreasing output.

As already seen, when elasticity on the demand or average revenue curve is less than one, total revenue decreases when output is increased. In other words, marginal revenue is negative at those levels of output where elasticity of demand is less than one. Since marginal cost can never be negative, therefore monopolist cannot be in equilibrium at those

output-levels where elasticity of demand is less than one.

There are some cases where the cost of production is zero or is not relevant to the pricing decision. For example, in case of mineral spring, costs of production are zero. Further, in the very short run, if a good is already on hand in excessive amount, cost of production is not relevant for fixing price. In these cases, monopolist has only to decide at which output his total revenue will be maximum.

This can be easily seen in Fig. 28.2 In this figure, the equilibrium position of the monopolist will be at
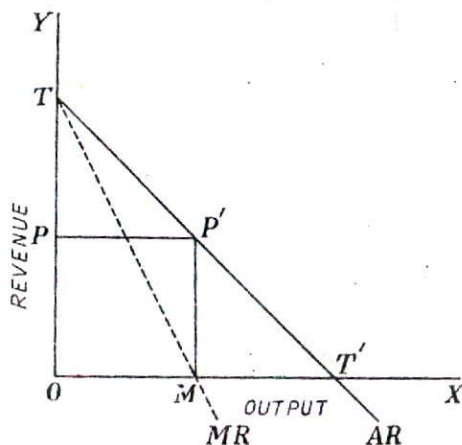
Monopoly Equilibrium when
MC is Zero
Fig. 28.2

output OM and price OP ($=MP'$). At OM output, MR is equal to zero. The equilibrium condition is satisfied at OM as in this case we are assuming that MC is zero. Therefore marginal revenue is equal to marginal cost. It will be seen that P' is the mid-point of the line TT' where the elasticity of demand is unity. Therefore, when marginal cost is zero, the equilibrium of the monopolist is established at that output where elasticity of demand is unity.

Short-run and Long-run View

We have discussed above the equilibrium of the monopolist without making distinction between his behaviour in the short run and the long run. The analysis made above is general which applies both to the short run as well as to the long run situations. In the short run, it should be carefully noted that the monopolist has to keep an eye on the variable costs. His price must not go below his average variable cost, otherwise he will stop producing. In the long run, the monopolist can change the size of plant in response to a change in demand. In the long run, he will make adjustment in the amount of the factors, fixed and variable, so that marginal revenue equals not only short-run but also long-run marginal cost.

In the short run, he equates the marginal revenue with marginal cost but in the long run he seeks to bring about equality between the marginal revenue with the long-run marginal cost which reflects the fact that the scale of the whole firm has been adjusted for maximisation of profits.

Does the Monopolist necessarily Make Profit?

The general impression is that since the monopolist is in a position to influence both price and output, he must always make a profit. But, it is not so. There can be situations, when his costs are so high and the market for his output so small that at no output will the average costs be covered. He may thus incur losses in the short run and continue in business if the price more than covers average variable costs. He can, however, minimise the losses by keeping the price above the average variable costs.

Long-run Adjustments Under Monopoly

An industry operating under perfect competition makes adjustments in the long run by the entry of new firms or exit of old firms and attains an equilibrium position. But under monopoly, the entry of new firms is blocked in several ways: The monopolist may be in control of some essential raw materials or he may hold some patents or the market may be too limited to give scope for profit to more firms. Entry may be blocked in other ways too. Thus, entry into the industry being blocked, the monopolist seeks to secure a position of vantage through adjustments in the scale of plant in the long run. Considering the size of the market for his product and his long-run average costs, the monopolist may maximise his profits by building (a) a less than optimum scale of plant, or (b) an optimum scale of plant or (c) greater than optimum scale of plant.

If the monopolist is incurring a loss in the short run and there is no plant size that can earn profit, then in the long run the monopolist will go out of business. If he is already making a profit, then in the long run, he will try to see if he can increase his profit by varying the size of the plant. A multi-plant monopolist will, in the long run, adjust the number of plants to attain a long-run equilibrium. The monopolist can, in the long run, construct each plant of such a size that short-run average cost coincides with long-run average cost at the minimum point on the latter curve. In other words, he can increase output by constructing more plants of suitable size instead of producing more units per plant at a higher unit cost.

Monopoly Equilibrium and Competitive Equilibrium Compared

We have now seen the conditions of firm's equilibrium both under conditions of perfect competition

and monopoly and have also studied how price is determined under them. We are now in a position to compare the two.

Similarity. The only really general feature which is common to both is that both under perfect competition and monopoly, the firm is in equilibrium at that level of output where marginal revenue is equal to marginal cost.

Differences. But there are many important differences which we give below:

(i) Under perfect competition, demand curve or the average revenue curve faced by an individual firm is perfectly elastic and is a horizontal straight line parallel to the horizontal axis. Therefore, under perfect competition, marginal revenue is equal to average revenue at all levels of output and marginal revenue curve coincides with the average revenue curve. But unlike this, under monopoly, demand curve or average revenue curve faced by the firm is falling downwards from left to right. Therefore, marginal revenue is less than average revenue at all levels of output and marginal revenue curve lies below the average revenue curve. Hence, in the equilibrium position, the marginal revenue will be smaller than the average revenue or price.

(ii) Both under perfect competition and monopoly, the firm is in equilibrium at that level of output where MC is equal to MR. But in perfect competition since MR is equal to average revenue or price, therefore, MC, when equal to MR in equilibrium condition, is also equal to price or AR. This is not true in case of a monopoly. Since under monopoly, MR is always less than AR or Price, in equilibrium MC will, therefore, be equal to MR but it will be less than price.

·Hence, under perfect competition, **MC = MR = AR (Price).. But under monopoly, MC = MR < AR (Price).**

Therefore, we conclude that whereas in perfectly competitive equilibrium the price charged by the firm equals its marginal cost, under monopoly, the price set is above the marginal cost. In fact, the difference between marginal cost and price is said to measure the degree of monopoly power.

(iii) Another main difference is that, whereas in perfect competition a firm is in the long-run equilibrium at the minimum point of long-run average cost curve, in monopoly the firm is in equilibrium at the point where AC is still declining and has not reached the minimum. It often happens in monopoly that the marginal cost curve cuts the marginal revenue curve to the left of the point of minimum average cost. The chief reason for this limitation of output is that, as output is increased MR drops below this thus lowering AR, whereas marginal cost is likely to increase. Under perfect competition, it pays the firm to expand production so long as the average cost is falling, because under perfect competition average revenue and marginal revenue both stay high for a large output as for small output.

(iv) While discussing the conditions for the equilibrium of the firm under perfect competition, we there that a firm is in equilibrium at that level of ut at which marginal cost is rising. Only in this ay the second condition of equilibrium, viz., marginal cost curve must cut the marginal revenue curve from below at the equilibrium output, is satisfied. Since in perfect competition the marginal revenue curve is a horizontal straight line, then if the marginal cost curve is to cut it from below, the marginal cost curve must be rising at and near the equilibrium output. But under conditions of monopoly marginal revenue curve is sloping downwards, and therefore it is possible for the marginal cost curve to cut it from below whether it (MC) is rising, falling or running parallel to horizontal axis.

These three cases of rising, constant and falling marginal cost at the equilibrium output are illustrated by diagrams (a), (b) and (c) respectively in the Fig. 28.3 In the Fig. 28.3 (a), the equilibrium of the monopolist is shown when marginal cost is rising at the equilibrium output. In Fig. 28.3 (b), the monopolist is in equilibrium when marginal cost remains
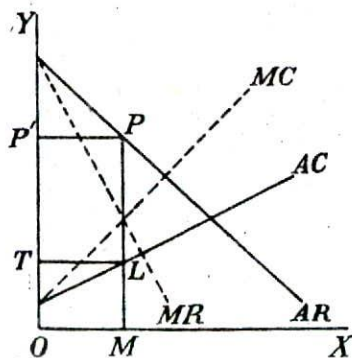
Equilibrium with Rising MC
Fig. 28.3 (a)
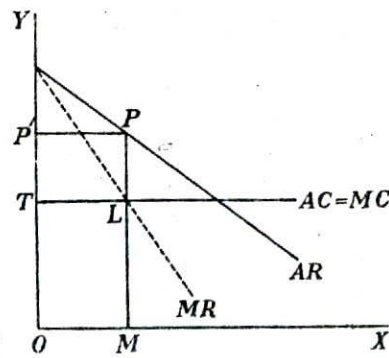
Equilibrium with Constant MC
Fig. 28.3 (b)
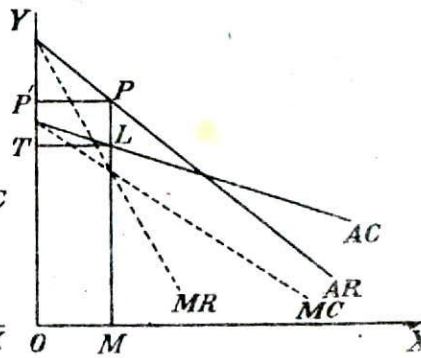
Equilibrium with Falling MC
Fig. 28.3 (c)

constant at and near the equilibrium output. In Fig. 28.3 (c), the equilibrium of the monopolist is established at the output at which marginal cost is falling. In all these cases, the price set is OP′ (=MP), the equilibrium output is equal to OM and total profits PLTP′.

Thus, while in the case of equilibrium under perfect competition, the marginal cost curve must be rising at or near the equilibrium output, under monopoly, a firm can be in equilibrium with rising, falling or constant marginal cost.

(v) Still another difference between the monopoly equilibrium and perfectly competitive equilibrium is that while under perfect competition in the long run, a firm can earn only normal profits, but a monopolistic firm may be earning supernormal profits even in the long run. If a perfectly competitive firm is earning supernormal profits in the short run, they are competed away in the long run by the entry of new firms in the industry. But in the case of a monopoly, there are sufficient barriers to the entry of new firms in the monopolised industry. Therefore, new firms cannot enter the industry in the long run to compete away the monopoly profits. [1]

Thus, under perfect competition, there may be supernormal profits in the short run, but they will be competed away in the long run. In monopoly, however, supernormal profits can persist even in the long run.

But it must not be thought that monopoly always guarantees supernormal profits. If the demand and
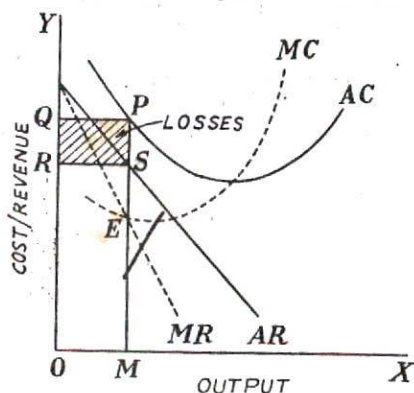
Monopolist Suffering Short-run Losses
Fig. 28.4

cost situation is not favourable, as shown in Fig. 28.4, the monopolist may suffer short-run losses. Despite his monopoly in the market, the firm shown in Fig. 28.4 suffers a loss in the short run because of a weak demand and high costs. Of course like the perfectly competitive producer, the monopolist firm shown in Fig. 28.4 suffers a loss in the short run, but

it must earn normal profits or more in the long run otherwise it will leave its business.

(vi) Another difference between competition and monopoly is that under monopoly price set is higher and output smaller than under perfect competition, given the same cost-revenue situation. This is so because the monopolist restricts output to raise
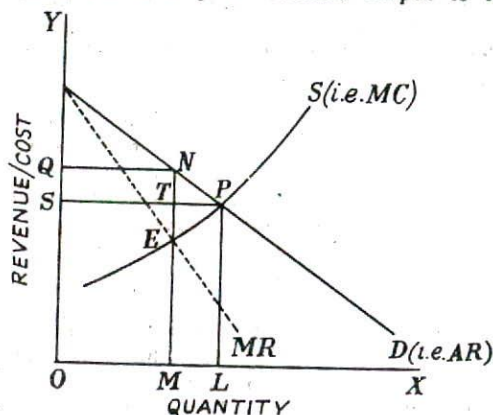
Higher Price but Smaller Output
Fig. 28.5

price. This can be explained with Fig. 28.5. In this figure, D is the demand curve. It is also the average revenue curve. S is the supply curve of the industry. It is in fact the lateral summation of the short-run marginal cost curves of the various firms constituting the industry. Now under perfect competition, the price LP (=OS) will be determined at which demand curve D and supply curve S intersect each other. The equilibrium output determined is OL.

Now suppose that all the firms combine or merge to form a cartel, that is, become monopoly.[2] Now a monopolist will be in equilibrium at that price-output level where marginal cost equals marginal revenue. In this figure, marginal cost equals marginal revenue at output OM and price fixed is MN (N being on the demand or AR curve). It is quite evident from the figure that when all the firms have merged together and become a monopoly, they have reduced the total output from OL to OM and raised the price from LP to MN.

Thus, in monopoly the price is higher and the output less than in perfect competition, conditions of cost and demand remaining unchanged.

(vii) Another difference between monopoly and perfect competition may be noted: A monopolist can charge discriminatory prices for his goods but a firm operating under perfect competition cannot. Under perfect competition, the price is fixed by the market and the producer cannot exercise any control over it. The question of charging different prices

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1. If in spite of the barriers, some firms enter the industry it will be no longer a case of monopoly.

2. We assume that no extra economies of scale arise when the different firms combine.

from different set of customers does not arise. On the other hand, a monopolist finds price discrimination both possible and profitable. For this purpose, he splits the market for his goods into sub-markets on the basis of elasticity of demand for his goods. Under perfect competition, the seller confronts a perfectly elastic demand curve at the prevailing price. If he charges a little higher price than the market price from some buyers, he will lose the customers. On the other hand, the monopolist has sole control over the supply of a product which has no close substitutes. Hence the demand curve for the monopolist's product is relatively inelastic. He can, therefore, charge different prices in different parts of the market, but the condition is that the elasticity of demand for the product should be different in different parts of the market.

(viii) Competitive industry implies more efficient allocation of national resources. The competitive industries operate, in the long run, at the minimum point of the average cost curves where average cost equals price. In case they tried to make higher profits, the entry of new firms will drive down prices and the extra profits will be competed away. In a competitive industry, a rupee worth of additional resources will produce a rupee worth of additional output, because average cost equals price. But since monopoly price is generally higher, the consumers are willing to pay more than a rupee for this additional output. This means that if these resources were used in the monopoly, the consumers would get greater satisfaction. But the monopolist does not permit this. It does not suit him. On the contrary, he restricts the output and thus reduces the consumers' satisfaction. Hence, from the point of consumers' welfare, the resources used in a monopoly represent a less efficient utilisation.

REGULATION OF MONOPOLY

A monopolist is a suspect in the public eye. He generally exploits the consumers. All governments, therefore, consider it necessary to curb his profit-making propensity in the interest of the consumers and the community at large.

The two common methods are: (a) Price regulation and (b) Taxation. Now a word about these.

Price Regulation

It is usual for the Government to regulate prices charged by public utilities like gas and electric companies. The underlying object is to call forth the maximum output consistent with the monopolists' cost and consumer demand. This is shown in diagram Fig. 28.6. In the absence of price fixation by the Government, the monopolist would produce OM output and charge OP (= MQ) price, because here MR = MC and Q is a point on the demand curve and shows what the consumers are prepared

to pay. Now let us suppose the Government fixes a lower price OP' (= M'L). At this price, the monopolist produces a larger output OM', since this price cuts the demand curve DD at L. Although the monopolist has been compelled to charge a lower
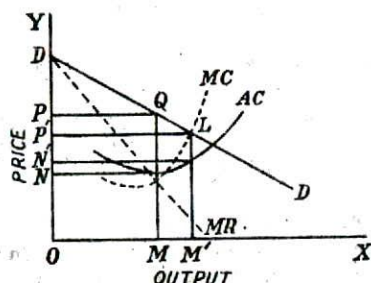
Price Regulation
Fig. 28.6

price, yet the consuming public has taken a larger quantity. This compensates the monopolist. OM' is the new profit-maximising output and his profit will be OM' output × P'N'. The consumers are benefited by a larger amount being made available to them at a lower price.

Taxation

Taxation is regarded as a very suitable device for regulating monopolies so that they are not able to exploit the consuming public by misusing their monopolistic power. Such taxes may be of two types: (i) Lumpsum tax irrespective of the quantity of the output and (ii) a fixed tax per unit of the output.

The lumpsum tax has to be borne entirely by the monopolist since it cannot be shifted to the consumers by way of the price rise. Already, the monopolist is supposed to have fixed a price which maximises his profit. If he could raise the price further he would have done so. If he could decrease the output to increase his profit, he would have done so. Since he has already fixed price and output which brings him maximum profit, he cannot now touch them. Hence, by imposing a lumpsum tax, the government can take away all or any proportion of his profit without adversely affecting the general welfare. This is, therefore, a very effective way of controlling the monopolist's behaviour.

As for the tax per unit of output, the monopolist will be induced to reduce output and raise the price in order to maximise his profit after paying the per unit tax. The price rise affects the consumer. The profits after the tax too are smaller than profits before the tax; since the tax is a variable cost. The total costs of the monopolist at the various levels of output are increased, but the total revenue remains the same. Hence, prices being higher and the output smaller, the general welfare is adversely affected.

Such a tax is a wholesome check on the misuse of monopolist's power.

Other Methods of Control

There are several other regulatory devices for curbing the exploitative propensity of the monopolist.

Reducing Barriers to Entry. The government should see that the barriers to the entry of outside firms into the monopolised industry are kept at the minimum. This would keep alive the fear of potential competition which would be a wholesome check on the monopolist.

Preventing Collusion. The government's anti-monopoly agency should keep a close watch so that there is no collusion among the monopolist firms to raise price and control supply. They should make sure that the price fixed is not higher than the true marginal cost.

Breaking Large Firms. The government's anti-trust policy should be such that the big firms do not become bigger. The capital issue control may be so exercised that they are not permitted to issue more capital. Further, they may not be given the supply of scarce materials. In these and other ways, large firms should be prevented from expanding.

Monopolies Commission. Periodical reports on the working of monopolies by a Commission may focus public opinion on the evil doings of the monopolists. This itself may keep them straight, failing which legislation may be adopted to weed out the known evils. Greater attention should be paid to preventing a bad market behaviour than to punishment after the misbehaviour.

Conclusion

There is no complete remedy to monopolist misbehavior. But sustained efforts have to be made to keep a close watch on the working of the monopolies and take necessary measures for their regulation and control. We have to console ourselves with the fact that things would have been worse and the consumer hit harder in the absence of such measures.

DISCRIMINATING MONOPOLY

Meaning of Price Discrimination

So far we have assumed that the monopolist charges only one price from all the purchasers of his commodity. This is generally not the case. The monopolist can, and some monopolists do, charge different prices for the same commodity from different people provided these people form "different markets" or belong to what are called non-competing groups. This is known as price discrimination or discriminating monopoly. Mrs. Robinson defines it as "charging different price for the same

product, or same price for the differentiated product.". The product may be differentiated by time, appearance or place so that the purchasers are not able to shift to the low-price commodity. Stigler defines price discrimination "as the sale of various products at prices which are not proportional to their marginal costs." [3]

Types of Price Discrimination

Price discrimination may be (a) personal, (b) local, or (c) according to trade or use. It is personal when different prices are charged from different persons. It is local when the price varies according to locality (*e.g.*, dumping). Discrimination is according to use when different prices are charged according to the uses to which the commodity is put, *e.g.*, electric current is usually sold cheaper for industrial uses than for domestic purposes. Sometimes the monopolist introduces product differentiation by means of special labels and charges different prices for the differentiated products.

Degrees of Price Discrimination

According to Prof. A. C. Pigou, there are three degrees of discrimination as under:—

(i) Price discrimination of the first-degree in which the monopolist charges a different price for each unit of the commodity sold. He charges the maximum that each buyer is able and willing to pay, leaving him no consumer's surplus. Obviously, this involves maximum exploitation of the buyers. This is known as perfect price discrimination.

(ii) Instead of setting price for each buyer as in the first degree discrimination, in the second degree, the buyers are divided into groups and from each group a different price is charged, which is the lowest demand price for that group. Thus, all units with a demand price greater than, say X, are sold at X price, all units with demand price greater than Y but less than X are sold at Y, and so on. Such a price discrimination is possible. The demand of each individual buyer is perfectly inelastic.

(iii) In the third degree discrimination, the monopolist splits the entire market into a few sub-markets and charges a different price in each sub-market.

Conditions of Price Discrimination

The essence of price discrimination is that the monopolist can charge different customers different prices although there is no fundamental difference between the goods offered to the different customers. Let us study the conditions (a) under which price discrimination is possible and (b) when price discrimination is profitable.

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3. Stigler, G. J.—*The Theory of Price*, 1953, p. 214.

When Price Discrimination is Possible

As already mentioned, a monopolist can practise price discrimination by dividing his market into sub-markets and charging different prices in each sub-market. This is possible only if the monopolist can keep these sub-markets absolutely separate. According to Pigou, there are two main conditions for this purpose:—

First, it should not be possible to transfer any unit of the commodity from one sub-market to another. That is, the goods sold in the cheaper market cannot be resold in the dearer market, otherwise monopolist's purpose will be defeated.

Secondly, it should not be possible for the buyers in the dearer market to sneak into the cheaper market to take advantage of the low price. For example, a patient, who is really rich, should not be able to pass as a poor person to avail himself of the lower fee charged by a doctor from the poor patients.

For the monopolist to keep his sub-markets separate to successfully practise price discrimination is possible under the following conditions:—

(i) **When consumers have certain preferences or prejudices.** Certain consumers, especially belonging to the upper class, usually have the irrational feeling that they are paying higher prices for a good because it is of a better quality, although actually it may be of the same quality. As Mrs. Joan Robinson observes, "various brands of a certain article which in fact are almost alike may be sold as different qualities under names and labels which induce rich and snobbish buyers to divide themselves from the poor buyers, and in this way the market is split up and the monopolist can sell what is substantially the same thing at different prices."[4]

Similarly upper class snobbish people prefer to shop in fashionable quarters, (e.g., Connaught Place in New Delhi) to going to a cheaper locality (i.e., Chandni Chowk, Delhi). This enables the monopolist to charge discriminating prices.

(ii) When the **nature of the good** is such as makes it possible for the monopolist to charge different prices. This happens particularly when the good in question is a **direct service**. While goods like combs and hairpins can be resold by those who are charged lower prices to those required to pay higher prices, it is not possible to resell haircuts or beauty treatment effected in a beauty parlour, so that different prices can be charged from different persons. There may be some difference in the standard of service rendered, but the difference in prices charged is usually far greater than the difference in the standard of service rendered. We often find that surgeons charge different fees from rich and poor patients for performing similar surgical operations.

(iii) **When consumers are separated by distance or tariff barriers,** the monopolist can charge different prices. A good may be sold in one town for Re. 1 and in another for Rs. 2 and so long as the cost of transport exceeds the difference in prices, resale will not be profitable. Similarly, the monopolist can charge higher prices in a country levying import duty on his commodity and lower prices elsewhere where no such duties are levied. Because of import duty it is obviously not profitable to import the commodity from countries where it is sold cheaper.

(iv) **Government Regulations.** Sometimes, the price discrimination occurs when the government rules and regulations permit. For instance, according to rules, electricity rates are fixed at lower level for industrial purposes and higher for domestic uses. Similarly, railways charge by law higher fare from first class passengers than from the second or third class passengers.

(v) **Ignorance and Lethargy.** Monopolists also take advantage of the ignorance of the customers or of their disinclination to take the trouble of comparing prices. In this way, they can charge higher prices from some customers than from others. They also sometimes cash on the impatience of the buyers, e.g., charging higher price for the 1st edition of a book.

(vi) **Same Service for Different Purposes.** When a monopolist, while rendering the same service, is able to cater for different needs of his customers, it is possible for him to charge discriminating prices. For example, railways charge different rates for carrying coal, silk and fruit even though the same train carries them all.

(vii) **Special Orders.** A monopolist can easily charge discriminating prices when goods are being supplied to special orders. In such a case, there is no question for the buyers to compare prices.

Possible only in Imperfect Competition. It is obvious that price discrimination can be practised only under imperfect competition. It is not at all possible when perfect competition prevails in a market. Under perfect competition, price prevailing in the market has to be accepted both by the buyers and sellers. The buyers can only adjust their purchases and the sellers the supply to the prevailing price. It is not in the power of the buyers or of the sellers (for the obvious reason that they are so many of them) to influence or modify the price in any manner. The seller faces a perfectly elastic demand curve. But when there is imperfect competition, taking the form of a monopoly or monopolistic competition, the seller is in a position to fix the price. The degree of price discrimination will depend on the degree of imperfection of the market.

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4. *Economics of Imp fect Competition*, pp. 180-81.
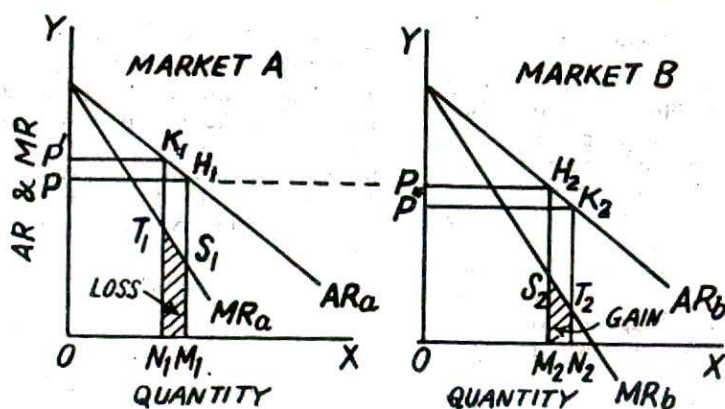
Same Elasticity: Discrimination Not Profitable
Fig. 28.7

When Price Discrimination is Profitable

We have studied above the conditions which make discrimination by a monopolist possible. Now let us see when such discrimination becomes profitable. Price discrimination is profitable only if elasticity of demand in one market is different from elasticity of demand in the other. Then the monopolist can go on dividing and sub-dividing his market till no two buyers with different elasticities are put in the same group, or till in each market the elasticity of demand is the same. The monopolist will find it profitable to charge more in the market where elasticity is low and low price where it is high. To quote Mrs. Robinson, "The sub-markets will be arranged in ascending order of their elasticities, the highest price being charged in the least elastic market, and the lowest price in the most elastic market."[5]

Discrimination Not Profitable When the Demand Curves Are Iso-elastic

In order to prove that unless the elasticity of demand in the sub-markets is different discrimination will not be profitable, we shall take the two markets where the demand curves are iso-elastic, *i.e.*, where, at every price, elasticity of demand curve is the same.

When in the two markets elasticity of demand is the same, then, the marginal revenue will also be the same. [6] Marginal revenue in the two markets being the same, it will not be profitable to transfer any unit of the commodity from one market to another in order to charge a different price. This will be clear from the above diagram (Fig. 28.7).

In this diagram, the demand curves ARa (in market A) and ARb (in market B) have the same elasticity at the price OP as at any other price ($OP = M_1H_1 = M_2H_2$). At this price (OP), marginal revenue in the two markets is the same ($M_1S_1 = M_2S_2$). Now if the monopolist transfers some units of the commodity from the market A by reducing M_1N_1 to the market B by adding M_2N_2, then the loss in market A shown in the shaded area $M_1S_1T_1N_1$ is greater than the gain $M_2S_2T_2N_2$ in the market B. This shows that when the demand curves have the same elasticity in the sub-markets price discrimination will not be profitable.

Price Discrimination Profitable when Elasticities Differ

The monopolist will find it profitable to charge discriminating prices, on the other hand, when the elasticities of demand in the two markets are different. Rather, this is the only way for him to maximise profits. In case he charged a single price in the two markets, his profits will not be maximum. But if elasticity of demand is different in the two markets, he would charge higher price in the market where elasticity is low and low price where it is high. When elasticities of demand at the single monopoly price are different in the two markets, the marginal revenue will also be different. The marginal revenue in the market with higher elasticity of demand is greater than the marginal revenue in the market where elasticity is lower. It will be obviously worthwhile for the monopolist to transfer some units of the commodity from the market where elasticity of demand is low to where elasticity is high. By such a transfer he will be increasing his profit. The market from which the units are transferred will experience a rise and the market to which the units are transferred will experience a fall in price.

How this is more profitable is illustrated in the Fig. 28.8 given on next page.

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5. *Economic of Imperfect Competition*, pp. 180-81.
6. This follows from the formula

$$MR = AR \left(\frac{e-1}{e} \right) \qquad \text{(See page 171).}$$

e stands for elasticity of demand.
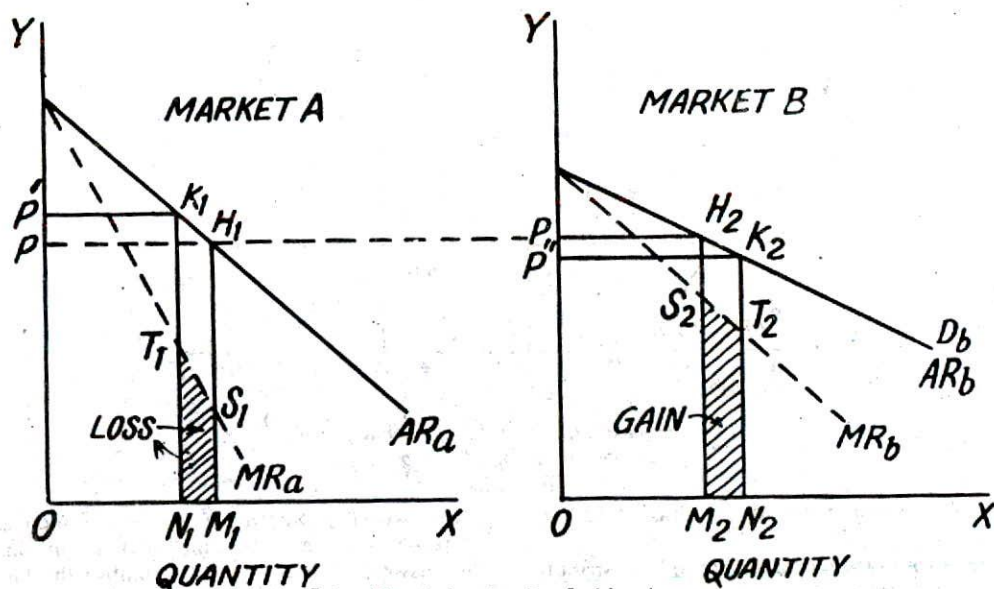
Price Discrimination Profitable when
Elasticities Differ
Fig. 28.8

In this diagram, elasticity of demand is greater in market B than it is in market A. This is indicated by the slope of the AR curves (ARb has a greater slope). In market B, marginal revenue $M_2 S_2$ is greater than marginal revenue $M_1 S_1$ in Market A. Now if sale in the market A is reduced by $N_1 M_1$ the loss in revenue ($M_1 S_1 T_1 N_1$) is much less than the gain ($M_2 S T_2 N_2$ in market B by increasing sales thereby $M_2 N_2$ It can be seen that, when $M_1 N_1$ units are withdrawn from market A, the price rises from OP to OP'. On the other hand, when $M_2 N_2$ units are added in the market B, the price falls from OP to OP''. That is, now the monopolist is charging different prices in the two markets as against one single price OP before and we see that his profit has increased thereby. Shifting of units of the commodity from market A to market B will continue till marginal revenues in the two markets are equalised, the profit will have been maximised and there will be no further shifting. This is so because, so long as MR is higher in market B, the monopolist will be adding more to his revenue than his loss in market A by transferring some amount of goods from A market to B market.

Price-output Equilibrium in Discriminating Monopoly

We have studied already how price and output are determined under conditions of simple monopoly. In the simple monopoly, a single price is charged for the whole output. But as explained above, in discriminating monopoly, different prices are charged for a commodity. We shall now see how

a monopolist decides the output to be produced under price discrimination and how he sets different prices for a commodity.

First of all, the monopolist divides his total market into sub-markets. The monopolist can divide his total market into several sub-markets but we shall explain the case of two sub-markets only. There is no difference in analysis even if the sub-markets are many rather than two. Our analysis can, therefore, easily be extended to cover several sub-markets.

Price discrimination by the monopolist has been illustrated in Figs. 28.9 (a), (b) and (c). In these figures, we see that the monopolist has divided his total market into two sub-markets A and B on the basis of elasticity of demand for the product in these two markets. Elasticity of demand is greater in market B than in market A. In market A, AR' is the average revenue curve and MR' is the corresponding marginal revenue curve. Similarly AR'' and MR'' are the average revenue and marginal revenue curves respectively in market B. CMR is the combined marginal revenue curve. CMR has been obtained by the lateral summation of MR' and MR''. MC is the marginal cost curve of the total output of the product.

The discriminating monopolist has now to decide what level of output he should produce. Like every other producer, he aims at maximizing his profits. As elsewhere, his profits will be maximum, and, hence he will be in equilibrium position, at the output at which MR = MC, and MC curve cuts the MR curve from below. It is evident from Fig. 28.9(c) that equilibrium of the discriminating monopolist is
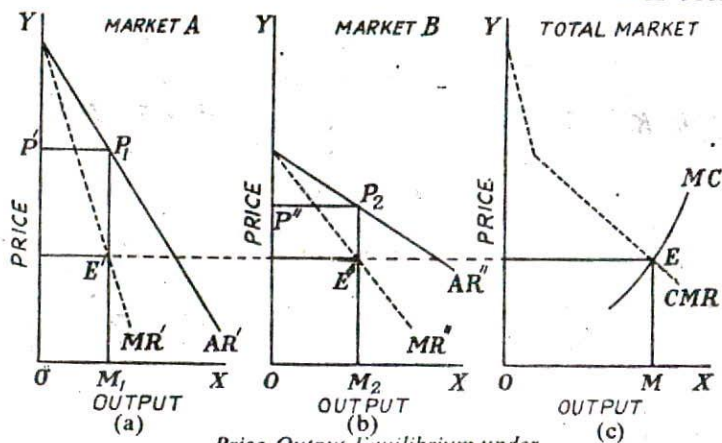
Price-Output Equilibrium under Discriminating Monopoly

Fig. 28.9

established at the output OM at which MC cuts CMR.

Now the output OM has therefore to be distributed between the two markets in such a way that marginal revenue in each is equal to ME which is the marginal cost, being on the MC curve. Therefore, he will sell output OM_1 in market A, because only at this output marginal revenue MR' in market A is equal to ME (M_1E' = ME). The price charged in the market for output OM_1 is equal to M_1P_1, P_1 being on the average revenue (AR') or demand curve. The output OM_2 will be sold in market B as only at this output, marginal revenue in market B, that is MR'' is equal to ME (M_2E'' = ME). Price charged in market B for output OM_2 is M_2P_2 which is lower than the M_1P_1 which is charged in market A. Thus, in market B in which elasticity of demand is greater, the price charged is lower than that in market A, where the elasticity of demand is less.

Hence, for the discriminating monopolist to be in equilibrium the following two conditions must be satisfied:

(i) Marginal Cost of Total Output = Combined Marginal Revenue.
(ii) Marginal Revenue in Market A = Marginal Revenue in Market B = Marginal Cost.

Price Discrimination and Output

Will the output in a Discriminating Monopoly be more or less than in a simple monopoly? When the elasticities of demand in the two markets are different, it will be found that marginal revenue from the sale of a unit of output will be more where the elasticity is high than where it is low. It will be, therefore, profitable to reduce the output and raise the price where the elasticity is low and increase the output and lower the price where the elasticity of demand is high. In this way, the marginal revenue in the two markets will be equalised.

But will the output on the whole increase, or decrease, or remain the same? Mrs. Robinson gives the answer: "It is possible to establish the fact that total output under discrimination will be greater or less than under simple monopoly according as the more elastic of the demand curves in the separate markets is more or less concave than the less elastic demand curve; and the total output will be the same if the demand curves are straight lines, or in any other case in which the concavities are equal.".[7] This holds good, however, if marginal cost under simple monopoly and discriminating monopoly is the same. But if marginal cost is falling, the increase in output in a discriminating monopoly will be accentuated and if the marginal cost is rising, then the decrease in the output will be accentuated.

On the whole, it is more likely that discrimination will increase rather than decrease output.

A few illustrations will make this point clear. In the case of certain books, the first edition is issued at a high price. The readers, whose marginal utility (intensity of demand) for the book is very high, purchase it at this price. After this edition is exhausted, a second edition is issued which is priced lower than the first. People of lower marginal utility also can now purchase the book. This process may be repeated several times and a very wide sale obtained. People with greater intensity of demand will not wait for cheaper editions. In this way, the monopolist appropriates the major portion of the consumer's surplus and increases his monopoly revenue to a point otherwise not possible.

Price Discrimination by Dumping

When discrimination takes the form of dumping, it is regarded as an obnoxious practice. Dumping occurs when producers (usually monopolists) of one country sell their goods in another country at prices below those charged from the consumers in the country of origin. In some cases, it may pay a

7. See Robinson, J.—*Op. cit.,* Chapter 10

monopolist to sell his commodity in the foreign market below even his cost of production.

The monopolist may have several motives for dumping: (a) to dispose of an over-stock casually produced due to wrong judgment of demand. (b) to develop new trade connections by charging low prices, (c) to drive competitors out of the foreign market whether foreigners or native producers, and (d) to reap economies of large-scale production.

An extreme case of dumping may be illustrated by the following table:

TABLE
HOME MARKET

Sale Price	Cost Price	No. of Units	Net Revenue
Rs. Ps.	Rs. Ps.		Rs. Ps.
10.00	5.00	100	500.00
9.75	4.75	150	750.00
9.25	4.50	200	950.00
8 50	4.25	250	1062.50
7.75	4.00	300	1125.00
7.00	3.75	350	1137.50
5.75	3.25	400	1000.00
4.75	2.75	450	900.00

It will be seen from the above table that, if the monopolist only produced for the home market, he would produce 350 units and sell them at Rs. 7 a unit. This will give him the largest net revenue, *i.e.,* Rs. 1,137.50.

Suppose he produced 450 units instead of 350. His total cost will be Rs. $450 \times 2\frac{3}{4}$ = Rs. 1,237.50. For 350 units his total cost would have been Rs. $350 \times 3\frac{3}{4}$ = Rs. 1,312.50.

Thus the monopolist can lower his total cost by Rs. 75 (Rs. 1,312.50—Rs. 1,237.50) by producing 100 units more.

It will be to his advantage to produce these extra 100 units even if he has to destroy them. He can thus sell these additional units in a foreign market with profit if he can charge a price just above the cost of transporting them. No foreign producer can compete with him at such a price.

Such a big advantage, however, is rare. We took an extreme case to illustrate the principle involved. Moreover, if the difference between the home price and the foreign price is greater than the cost of transporting the commodity back to the country of its origin, the commodity may be re-exported, unless high tariff walls stand in the way. Foreign countries usually raise high tariff walls against dumping, especially if it affects their own industries. It is a temporary phenomenon and does not confer any permanent benefit on the country into which goods are dumped. "The possibility of dumping in a foreign market will raise the home price if marginal costs are rising, lower it if they are falling and leave it unaltered if they are constant." (Benham).

Effects of Price Discrimination

From the analysis of price-output equilibrium under discriminating monopoly we find—

(a) It increases the monopoly power of the producer;

(b) it gives the monopolist higher profits; and

(c) the total output is larger than under simple monopoly.

Is Price Discrimination Beneficial to Society? [8]

No straight and simple answer may be given to this question. Price discrimination can be beneficial in some cases, whereas it may be detrimental in other cases.

In certain cases, price discrimination may be to the advantage of the community, for instance, when a particular service may be very useful to the community. If the price is fixed low enough for the poorer classes, production costs may not be met due to absence of normal profit per unit. If the price is fixed too high, the total receipts again may be low due to meagre sales. The commodity may, therefore, not be produced at all. At any rate, some output may be held up, because average revenue in a discriminating monopoly is greater than under simple monopoly. "It may happen, for instance, that a railway would not be built, or a country doctor would not set up in practice, if discrimination were forbidden. It is clearly desirable that price discrimination should be permitted in such cases." If discriminatory prices are charged, the total receipts may be adequate to meet the total cost with profit. Thus, every one may gain from the production of such a commodity when discriminatory prices are charged.

Since discrimination involves raising the price for some people and lowering for some others, it is obvious that price discrimination is beneficial to some and harmful to others. But the net effect on social welfare will depend on which group the society likes to favour. If the price is lowered for the masses and raised for the 'classes' the society has nothing to regret, for such an arrangement is obviously intended to promote economic welfare.

But, in the case of geographical discrimination, it is also possible that the less elastic market (for whom the price is raised) may be the home market, whereas the market abroad may happen to be more elastic and for them the price will, therefore, be lowered. In a case like this, the foreigners gain at the expense of the nationals of the country. Such a price discrimination is clearly detrimental to the com-

8. See Robinson, J.—*op. cit.*, Chapter 10.

munity concerned. There is, however, one qualification. If the industry obeys the law of increasing returns (or diminishing marginal costs) even the less elastic markets will gain from the larger output (at reduced costs) in discriminating monopoly than under simple monopoly. Thus, dumping abroad is likely to lower the price for the home market too and thus benefit the country concerned.

Conclusion. Mrs. Robinson thus concludes: "From the point of view of society as a whole it is impossible to say whether price discrimination is desirable or not. From one point of view, therefore, price discrimination must be held to be superior to simple monopoly in all those cases in which it leads to an increase of output, and these cases are likely to be the more common. But against this advantage must be set the fact that price discrimination leads to a maldistribution of resources as between different uses . . . . Before it is possible to say whether discrimination is desirable or not, it is necessary to weigh up the benefit from the increase in output against this disadvantage. In those cases in which discrimination will decrease output, it is undesirable on both counts." [9]

MONOPOLY POWER

All monopolies are not equally powerful. Some monopolists are able to exercise greater control on price-output than others. We should not, therefore, think that all monopolists have the same capacity for influencing price and output in an industry. The degree of monopoly power is indicated by the extent of influence that a monopolist can exercise on price and output. **By monopoly power we mean the amount of discretion which the monopolist possesses or the intensity of competition which affects him in shaping his policy with regard to the output and the price of his product and to the differentiation of his production by quality and service.**

In short, monopoly power indicates the extent of the departure from the competitive behaviour.

Measurement of Monopoly Power

Now let us see how this monopoly power can be measured. Have we got any measure by which we can say that this particular monopolist has so much monopoly power or so much more or less than another monopolist?

There are different ways of measuring monopoly power:—

(i) **Excess of Price Over Marginal Cost.** We have said above that the monopoly power indicates a departure from the competitive behaviour. It is the extent of this departure which indicates the extent of

monopoly power. We have already seen that in a perfectly competitive equilibrium, marginal cost equals price or AR. But this is not so under monopoly. Under conditions of monopoly, AR (Average Revenue) curve slopes downwards to the right, whereas under competition, the two curves AR and MR (Marginal Revenue) coincide, and both are horizontal straight lines. In a monopoly, MR curve is always below the AR curve. Since the firm is in equilibrium where marginal revenue is equal to marginal cost, the MC (Marginal Cost) is less than AR (Average Revenue), and AR, *i.e.*, average revenue is price. This can be put as under:—

In equilibrium (whether monopoly or competition), $MR = MC$.

But in monopoly MR is less than AR (*i.e.*, Price).

∴ MC is less than AR (*i.e.*, Price).

On the other hand, in perfect competition $MC = Price$.

This is the major difference between monopoly and competition, *viz.*, (to repeat) in competition MC (marginal cost) is equal to price whereas under monopoly MC (marginal cost) is less than the price. We can, therefore, say, that **monopoly power is indicated by the extent to which marginal cost departs from price.** In other words, the size of the difference between marginal cost and price is sometimes used to measure the extent of a firm's monopoly power.

A.P. Lerner has given the following formula for the measurement of this monopoly power:—

$$\text{Measure of Monopoly Power} = \frac{P - MC}{P} \quad \ldots(1)$$

Here P is price and MC is Marginal Cost.
Under competition $P = MC$. $\quad \ldots(2)$
From 1 and (2), we get
$$\frac{MC - MC}{P} = \frac{0}{P} = 0$$

In this case (*i.e.*, under competition), therefore, monopoly power is nil. To the extent price exceeds marginal cost, the monopoly power is greater than what it is under competition.

Elasticity of Demand and Monopoly Power. We have explained above that the difference between marginal cost and price measures the degree of monopoly power. The larger is the difference the greater is the firm's monopoly power, and *vice versa*. This difference ultimately depends upon the elasticity of demand for the firm's product. Differing elasticities of demand measure the degree of monopoly power. The less is the elasticity of demand the greater is the power or degree of monopoly.

(ii) **Amount of Supernormal Profits.** There is another way to measure monopoly power, *viz.*, by the amount of supernormal profits. Under perfect or

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9. *ibid.*, p. 206.

free competition, firms can earn only normal profits in the long run. If there are supernormal profits they are competed away. This is due to the fact that the new firms will enter the industry and the existing firms will also expand. The result will be that price will come down and costs will go up so that extra profits disappear. But this cannot happen under a monopoly. Since competition is absent, supernormal profits will persist in a monopoly; they are not competed away.

Hence, the size of the supernormal profits will measure the degree of monopoly power. The stronger the monopolist's position the larger will be the size of the supernormal profits.

Thus, there are two measures of monopoly power:

(i) **The difference between the marginal cost and the price; and**

(ii) **the size of the supernormal profits.**

Is Monopoly Price a High Price?

Not necessarily. We have seen that monopoly power enables a monopolist to restrict his output and charge a price higher than the marginal cost. Competitive price, however, tends to equal the marginal cost. This, however, does not mean that monopoly price is necessarily and invariably higher than competitive price. Several influences may keep the monopoly price down and in some cases may bring it to a level lower than what it would be under competition.

The monopolist may be able to produce an article at a lower cost per unit on account of the exceptional advantages that he may enjoy as regards the scale of production, in advertising, marketing expenses and other overhead charges. Thus, even though he may charge a price higher than his own marginal cost, it may be lower than what would be the marginal cost under competition. This is the case especially with industries using large and expensive indivisible equipment, and the demand for the products of which is elastic. Expansion of output in such industries reduces cost per unit, and larger output can be sold at remunerative, though low, prices.

Normally, however, monopoly price is rarely lower than the price under competition. But this does not mean that monopoly price is inordinately a high price. As we shall see below, there are serious limitations on the power of a monopolist. He is not always able to charge prices which would theoretically maximize his profit. Apart from the fact that the monopolist may be ignorant of the level of the price, which gives him maximum returns due to difficulties of assessing the factors involved, there are certain considerations which few monopolists can ignore. (These are discussed on page 222).

Conclusion. But in spite of these restraining influences, monopoly prices are generally higher than the competitive prices. Our conclusion is that the monopolist is in a position to charge less, but he does not. Monopoly price thus need not be higher, but it actually is.

CRITICISM OF MONOPOLY

People look at monopolies with suspicious eyes because it is thought that monopoly involves exploitation of the consumers. Because of their anti-social consequences, governments have taken steps to control and regulate monopolies so as to compel them to work in public interest. The various objections raised against monopoly are stated below: —

Firstly, it has been pointed out, as explained earlier in the chapter, that monopolist finds it possible and profitable to restrict output and charge higher prices than would the competitive producers. The profit maximising price of the monopolist is very likely to set a scale of production below the optimum size possible for the monopolist. This means that monopoly does not seek to use fully the internal economies of production and thereby lower the cost per unit, and the price. The result is that the consumers pay more for the product than the cost of production. That is, they pay more than what is necessary to put the resources in the industry.

Owing to the reduction in output, the complementary factors have to seek employment elsewhere, where their marginal productivity will be lower. Consequently, the price that these complementary factors will fetch will be correspondingly lower. On the other hand, the volume of output in other industries, to which these productive resources have been transferred, will expand. Thus, the owner of the monopolised resource has a higher income, whereas the owners of the other resources are worse off. Such will be the consequences brought about by the revisions in consumer income allocations induced by these income and price changes. They will also be the result of ripples of changes affecting the organisation of production.

Further, monopoly involves misallocation of resources. The monopolist will not use resources at their peak potential efficiency. His profit maximisation does not necessarily indicate either the optimum rate of output or the optimum scale of the plant. In other words, under monopoly the allocation of resources is not conducive to maximum welfare or satisfaction. Maximum welfare of the society requires that the level of output should be fixed at that point where marginal cost equals price. But price set under monopoly stands above marginal cost and does not therefore maximize welfare.

Price is indicative of the marginal utility or satisfaction derived by the society from the good. Therefore, society will gain in welfare if more resources are employed to produce more of that good so that price (i.e., marginal utility) becomes

equal to marginal cost. But the monopolist finds it profitable to restrict output to a level at which price is higher than marginal cost, and, therefore, he employs fewer resources than are justified from the point of view of social welfare. The monopolist forbids the entry of resources in the desired quantities. They must, therefore, remain in use elsewhere, where their contribution to consumers' satisfaction is smaller.

Another criticism of monopoly is that the supernormal profits, which monopolists make, contribute to greater inequality in the distribution of income. Under competitive conditions, firms will earn only normal profits in the long run. But surplus profits are persistently realised by monopolists even in the long run. But surplus profits are persistently realised by monopolists even in the long run. By virtue of their monopoly power, monopolists obtain a large share of the national income. Thus, monopolies increase income inequalities in the country.

Further, it has been alleged that monopoly retards technological progress. Incentives to develop new products and new techniques on the part of monopolist are very weak. This is because there are no rivals of the monopolist. It is only competition which induces one to introduce improved techniques so as to improve efficiency and productivity. Because of the absence of competition, monopoly can afford to be inefficient and lethargic.

Moreover, it has been argued that a monopolist is likely to resist or withhold technological improvement in both product and productive techniques in order to use the present capital equipment fully. Introduction of new and improved products and techniques may be resisted by the monopolist to avoid any losses caused by the sudden obsolescence of existing machinery and equipment.

The monopolist may, through advertisement and sale promotion measures, enlarge the demand for his products and even may make the demand less elastic by convincing the people of the desirability, nay the indispensability, of his product.

Finally, it is argued that monopoly creates unemployment. As explained before, monopoly restricts output to raise the price. When output is smaller, fewer men will be employed, hence, retrenchment and unemployment. In other words, monopoly equilibrium is an equilibrium with **'excess capacity'**, which means that there is under-utilisation of resources.

RESTRAINTS ON MONOPOLIES

It will perhaps seem that the monopolist would be able to charge whatever price he liked, his sole consideration being to maximise his profit regardless of social welfare. But the monopolist cannot, in actual practice, behave like an autocrat. There are several checks on the abuse of monopoly power:

In the first place, a monopolist is always afraid of **potential rivals.** If he charges too high a price, some other entrepreneurs will surely enter the field to take advantage of the high price and wrest from him a share of the high profits that he is making.

Secondly, the consumers may not take it lying down. There is a limit to their exploitation. An increase of one Paisa in the price may prove to be the last straw on the camel's back. **The consumers may actively organise a boycott.** No monopolist can afford to alienate the sympathies of his customers.

Thirdly, there is hardly any commodity for which substitutes, more or less satisfactory, cannot be found. The monopolist's greed can be effectively checked by resort to substitutes. The consumers are willing only to allow a certain margin between the price of the monopolised product and the substitute. As soon as that margin is exceeded, the substitute comes in.

Fourthly, the monopolist cannot ignore the **conditions of demand** and take independent unilateral action. He is bound to consider at every step the state of demand. If the demand is elastic, the monopolist's position is correspondingly weak.

Fifthly, we have seen that a combination (*i.e.,* monopoly) is constantly threatened by forces from within. It is not so easy to maintain a combination. It is usually a house divided against itself and they cannot, therefore, do as they please.

Finally, there is the fear of State intervention. The State, as the custodian of the interests of the general public, cannot allow a monopolist to exploit the community. If need be, it is prepared to intervene. This acts as a wholesome check on the autocratic tendency of the monopolist.

Summing up. Thus, the price-output policies of the monopolist are constrained by the threat of potential competition, competition from close substitutes and by indirect competition from all commodities that can be purchased with consumers' income and fear of state intervention.

PRICE UNDER MONOPSONY

The difference between competitive buying and monopsony buying is that, in the former case, there is a large number of buyers, and the purchases of none of them can affect the market price. To each the supply is perfectly elastic. A slight variation in his price offer will vitally affect the amount of his purchases; for instance, if he offered even a little less than the market price he will be able to buy nothing. The market price, so far as each individual purchaser is concerned, is given. He will buy an amount which equates his marginal utility to the price. But under monopsony there is one buying agency or the buyers are supposed to act in a concerted manner.

A monopsonist will so regulate his purchases as to equate marginal cost to marginal utility, since he

must pay the supply price of the commodity. Under competition, it is the price or average cost which is equal to marginal utility. The difference between marginal cost and price will arise only when the industry is working under increasing or decreasing cost.

When the industry is operating under the constant supply price, the average cost (i.e., price) and marginal cost are equal and the amount purchased under competition and monopsony will be the same.

When, however, the industry is working under increasing supply price, the larger the amount the monopolist purchases, the higher will be the price that he has to pay. The marginal cost to him will be greater than the supply price of the commodity.

But, under conditions of decreasing supply price, the larger the amount purchased, the lower will be the supply price, and the marginal cost to him will be less than the supply price. In this case, he will buy more than under competition.

Just as the monopolist aims at maximising his profit, in the same manner the monopsonist aims at maximising his consumer's surplus, and consumer's surplus is maximum when the marginal cost is equal to marginal utility. This may be called the optimum purchase. If the amount purchased exceeds this, the marginal utility will be less than the marginal cost and the consumer's surplus will be reduced. Purchasing short would mean that the utility is reduced more than the saving in cost.

A monopsonist can also resort to price discrimination like monopolist by tackling the sellers separately. "The monopsonist will buy from each source of supply in such a way that the marginal costs to him of the outputs bought from each source are equal to each other and to the marginal utility of the whole amount purchased, in just the same way as the monopolist will sell in each separate market such an amount that the marginal revenues are equal in each market and equal to the marginal cost of the whole output. The possibility of discriminating with advantage will depend upon a difference in the elasticities of supply from various sources, that is the elasticities of the average cost curves of each group of sellers."[10] To what extent the monopsonist can discriminate will depend on the number of the sellers and the supply conditions of each.

In a way, a monopolist is a monopsonist of the factors that he uses and if the factors are not homogeneous, he will be able to discriminate between them, especially in the case of an imperfectly elastic supply.

BILATERAL MONOPOLY

The term 'bilateral monopoly' is applied to a situation when a monopoly of purchase is matched

with the monopoly of sale i.e., a single monopolist is facing a single monopsonist. In the real world, it is not common to come across such a situation.

The monopolist wishes to operate on a scale where the marginal cost is equal to marginal reveneue, because that will bring him the maximum monopoly profit. On the other hand, the monopsonist wishes to purchase an amount at which marginal cost is equal to marginal utility. This indicates one optimum price for the buyer and another for the seller.

Which price between these two sides will be actually established, there is no economic principle to determine. Full knowledge about the demand and cost curves is lacking and it is not possible to indicate definitely the output and the price which will rule. The price will depend on the circumstances of each case. In most of the cases, it will be a compromise price which may be influenced by the respective bargaining skill of the parties. Besides economic motive, the administrative factors may also enter into the decision.

We may, therefore, conclude that, in case of bilateral monopoly, the price and output are **indeterminate**.

The following diagram (Fig. 28.10) illustrates the
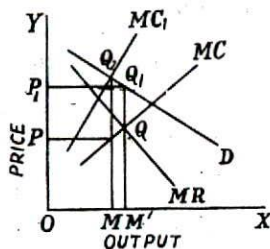
Price-output in Bilateral monopoly
Fig. 28.10

price-output determination in the case of bilateral monopoly.

In this diagram DD is the demand curve, MC the marginal cost curve and MC_1 represents the marginal cos of buying an additional unit.

In bilateral monopoly, each side wants to get the better of the other through bargaining skill. The monopolist will like the monopsonist to behave—as if he were one of the many buyers as in perfect competition, so that he (i.e., buyer) may accept the price fixed by him (the monopolist producer). Similarly, the monopsonist will like the monopolist to behave as if he were a perfect-competition producer (i.e., one of so many) unable to influence price, so that he (the monopsonist buyer) can purchase at his own price. Now nothing can be said as to who will succeed and how far. Most probably, there will be a compromise between the two extremes.

According to the analysis presented by this diagram, the monopolist will be maximising his profit

(MR = MC) if he sold OM′ output and charged OP₁ (= M′Q) price, since Q₁ is a point on the demand curve D showing what the purchaser will be willing to pay under perfect competition. On the other hand, the monopsonist will like to buy OM at OP price, since Q₂, where D and MC₁, intersect, is a point where buyer's marginal valuation equals marginal cost of purchase. As we have said before, none can hope to achieve his objective completely and there will be a compromise between the positions that each would like to take. Hence, price will be somewhere between OP and OP₁ and the output between OM and OM′ depending on the relative bargaining skill of the parties.

APPENDIX

REGULATING MONOPOLY THROUGH TAX-ATION

Diagrammatic Representation

In order to prevent exploitation of consumers by the monopolist, the government may use the tax weapon. The tax may be: (1) Specific tax or (2) a lumpsum tax.

Specific Tax

A specific tax is a variable cost and as such pushes up both MC and AC by an amount equal to the tax. Since the monopolist is supposed to have already pitched high his price, he may not altogether succeed in transferring the tax burden on to the consumer. The following diagram represents this situation:

Fig. 28·11

Before the tax:

MR and MC intersect at E; hence Price = OP = MQ and output is OQ.

After the Tax:

MR and MC² intersect at E²; Price = OP² = M²-Q²and output is OQ². Since M²S²X output −MS x output, the monopoly profit will be smaller than

before. It results in higher prices and smaller output.

Lumpsum Tax

A lumpsum tax is an excess profit tax and is levied primarily to reduce inequalities of income distribution. It may also aim at regulating profits at a socially desirable level. The following diagram illustrates this situation:

Before Tax:

MR = MC at E; Price is OP, output OQ and monopoly profit = PKEM

After Tax:

Lumpsum tax is like a fixed cost. When such a tax is levied AC is pushed up to AC². It does not affect MC. Hence equilibrium output remains the same. Thus monopoly output is OQ and price is OP. Since the average cost is now higher, the monopolist's profit is reduced after the tax as we can see PSFM < PKEM. Thus the incidence of a lumpsum tax is entirely on the monopolist. But it confers no benefit on the consumer since price remains the same.

Fig. 28·12

(2) MARK-UP PRINCIPLE

The businessmen can ignore the principle of maximisation of profits only at their peril. As Prof. Samuelson observes, "If a firm is absolutely reckless in calculating costs and revenues, then the Darwinian Law of the Survival of the fittest will probably eliminate it from the economic scene. Therefore those firms which do manage to survive cannot be completely oblivious to the maximisation of profits." In order to maximise profits, a businessman tries to equate MR with MC but he needs full information on marginal costs and elasticity of demand which is lacking. In order to maximise profits he 'marks up' price as a certain percentage of the average cost.

PRICE-OUTPUT UNDER MONOPOLISTIC COMPETITION

Meaning of Imperfect Competition. We have now seen how prices and output are determined in a perfectly competitive industry and also in monopoly. In fact, the case of ordinary monopoly described in the last chapter is an extreme form of imperfect competition. Imperfect competition covers all situations where there is neither pure competition nor pure monopoly. [1] Both perfect competition and pure monopoly are very unlikely to be found in the real world. In the actual world, it is the region of imperfect competition lying between these two extreme limits which prevails.

The fundamental distinguishing characteristic of imperfect competition is that the average revenue (AR) curve slopes downwards throughout its length, but it slopes downwards at different rates in different categories of imperfect competition. In some cases, firm's average revenue curve slopes downwards only gently where competition is nearly perfect and in some other cases, it slopes very steeply where competition is extremely imperfect. "There is no single case of imperfect competition but a whole range or series of cases representing progressively more and more imperfect competition." [2]

We discussed in the last chapter one case of imperfect competition, namely, that of ordinary monopoly. In the present chapter, we shall discuss the another form of imperfect competition, *viz.*, monopolistic competition.

MONOPOLISTIC COMPETITION
Meaning and Nature

Monopolistic competition refers to a market situation in which there are many producers producing goods which are close substitutes of one another or where output is differentiated.

The important distinguishing characteristics of monopolistic competition are, (a) Product Differentiation, (b) existence of many firms supplying the market, and (c) the goods made by them are close substitutes. *i.e.*, their products are similar but not identical.

Product Differentiation. In sharp contrast to perfect competition, where there is only one homogeneous commodity, in monopolistic competition there is **differentiation of products.** "Products are not homogeneous, as in perfect competition, but neither are they only remote substitutes as in monopoly. What this really means is that in monopolistic competition there are various 'monopolists' competing with one another. These competing monopolists do not produce identical goods. Neither do they produce goods which are completely different. Product differentiation means that products are different in some ways, but not altogether so." [3]

Many examples of monopolistic competition and product differentiation can be cited. Many firms in India produce toothpaste, but the product of each differs from its rivals in one or more respects. Different toothpastes like Colgate, Binaca, Forhans, Kolynos, McClean, and soaps Lux, Sunlight, *etc.*, provide examples of monopolistic competition. Other examples of monopolistic competition are those of the producers of soap (Lux, Rexona, Breeze, Hamam, Sunlight, *etc.*), toothbrush (Colgate, Dr. West's, Wisdom, *etc.),* retailers shops, barber shops, *etc.*

'Real' or physical differences, like those of materials used, design and workmanship, are no doubt important means of product differentiation. But "imaginary" differences created through advertising,

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1. We have defined pure monopoly in the way defined by Prof. Sraffa, that is, pure monopoly is that situation when a producer is so powerful that he is always able to take the whole of all consumers' incomes whatever the level of his output.

2. Stonier and Hague—*A Text-book of Economic Theory,* 1953, p. 164.

3. Stonier and Hague—*A Text-book of Economic Theory,* 1953, p. 183.

packing and the use of trade marks and brand names are the more important methods by which products are differentiated, even if physically they are identical or almost so. Finally, the conditions of sale also help in the differentiation of the products. For example, the location of a shop, the courteousness of those who serve at the counters, *etc.,* makes for the differentiation of products.

Many Firms. Under monopolistic competition, there are many firms, but it must not be assumed that it requires hundreds or thousands of firms. It requires only a fairly large number—say 25, 30, 60 or 70. Many important conclusions follow from the existence of a fairly large number of firms: First, an individual firm has relatively small part of the total market so that each has a very limited control over the price of the product. Again, the presence of relatively large number of firms ensures that collusion by them to restrict output to raise price is most unlikely. Finally, with a large number of firms in the industry, there is no feeling of mutual interdependence, that is, each firm determines its price-output policies without considering the possible reactions of rival firms.

In other words, a monopolistically competitive firm follows an **independent price policy.** And this is a very reasonable way to act in a market where one's rivals are numerous. If a firm lowers its price, its gain in sales will be spread thinly over many of its rivals so that the extent to which each of the rival firms suffers will be negligible. Hence these rivals will have no reason to retaliate.

As in perfect competition, in the monopolistic competition too, in the long run, there is freedom of entry and exit. That is, in this case, there are no barriers to entry as found under monopoly.

As explained above, when there is monopolistic competition, the commodity bought and sold is not a standardised commodity but a differentiated product. Hence, competition is no longer exclusively on the price basis. Buyers are now buying a combination of physical product and the services which go with it (location of store, packing, trade mark, personality of sales people, and so on). The buyers are willing to pay for their favourite product something more than the market price of a standardised product. This will depend on the estimate **in their own minds** as to the superiority of their favourite product, regardless of its intrinsic worth, or what the seller claims it to be.

Because of consumers' attachment to a particular brand, the seller acquires a monopolistic influence on his market. If he raises his price a little, he may lose many of his customers, but not all of them. Similarly, a reduction in price may bring him some additional customers but not many. Thus, the demand curve facing a firm under monopolistic competition is a downward sloping curve, *i.e.,* if he wants to sell more, the seller has to lower his price.

This is unlike the demand curve in perfect competition, where for any individual seller, the curve is absolutely elastic at the ruling price (*i.e.,* it is a horizontal straight line parallel to the X-axis). He cannot influence the market price but he can sell any amount at the prevailing price, without having any fear of depressing it. But, under monopolistic competition this is not so. The seller has some amount of monopolistic control over his brand but his control is tempered by the realisation that there are close substitutes (similar though not exactly identical products) available in the market. Hence, too high a price will mean his customers shifting to the rival brand.

Thus, unlike as in perfect competition but as in monopoly, the demand curve (or the average revenue curve) for a firm under monopolistic competition is a downward sloping curve. But unlike monopoly, where there are no close substitutes available for the monopolised commodity, the demand or average revenue curve under imperfect competition is fairly elastic, because of the presence of close substitutes.

Price-output Determination Under Monopolistic Competition

It may be borne in mind that price-output determination is the same thing, as an analysis of equilibrium of a firm.

Since, under monopolistic competition, different firms produce different varieties of the product, therefore, different prices for them will be determined in the market depending upon their respective demand and cost conditions. Each firm under monopolistic competition seeks to achieve equilibrium or profit-maximising position as regards (1) price and output, (2) product adjustment and (3) adjustment of selling costs. In other words, the producer, under monopolistic competition, must make optimal adjustments not only in the price charged and as regards the quantity of output sold but also in the design of the product and the way in which he promotes the sales.

Further, we have to study not only individual equilibrium of a firm but also group equilibrium of the firms in the market.

We shall now analyse these aspects. We first take up **Individual Equilibrium.**

Price-output Equilibrium

The question arises at which price-output level the monopolistically competitive firm will be in an equilibrium position? Here we have to remember that every seller, whether a monopolist or one working under perfectly or imperfectly competitive situation, wants to maximise his profits. As we saw in the previous chapter, the seller will go on producing till the extra receipts to be had from

additional production exceed the extra costs to be incurred in the production process, and he will stop where the extra receipts and extra costs have been equalised. This will be the point of maximum profit. In other words, profits will be maximised when marginal revenue is equal to marginal cost. So long as the marginal revenue is greater than the marginal cost, the seller will find it profitable to expand his output; and, if the marginal revenue is less than the marginal cost, obviously it is to his advantage to reduce his output to the point where marginal revenue is equal to marginal cost.

Short-run Equilibrium

In the short run, therefore, the firm will be in equilibrium when it is maximising its profits, i.e., when Marginal Revenue = Marginal Cost.
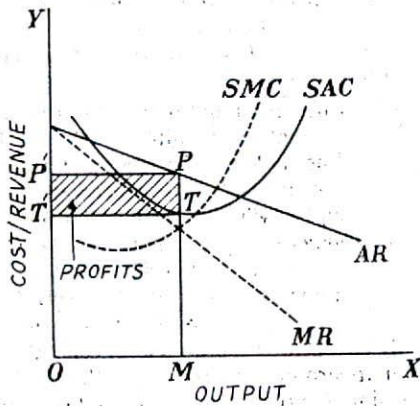
Equilibrium under Monopolistic
Competition: Short-run
Fig. 29.1

In the figures (29.1 and 29.2), AR is average revenue curve, MR is marginal revenue curve, SAC is the short-run average cost curve, and SMC is the short-run marginal cost curve. In these figures, marginal revenue curve (MR) and marginal cost curve (SMC) intersect each other at the output OM at which price is OP' (=MP), because P is a point on AR (average revenue), i.e., price.

In Fig. 29.1, the firm is earning supernormal profits. Supernormal profit per unit of output is the difference between average revenue and average cost at the equilibrium point. In this case, in equilibrium, the average revenue is MP and average cost is MT (T is on SAC). Therefore, PT is the supernormal profit per unit of output. Total supernormal profit will be measured by the area of the rectangle PTT'P', i.e., output multiplied by supernormal profit per unit of output.

But if the demand and cost situations are less favourable, then the monopolistically competitive firm will be realising losses in the short run as
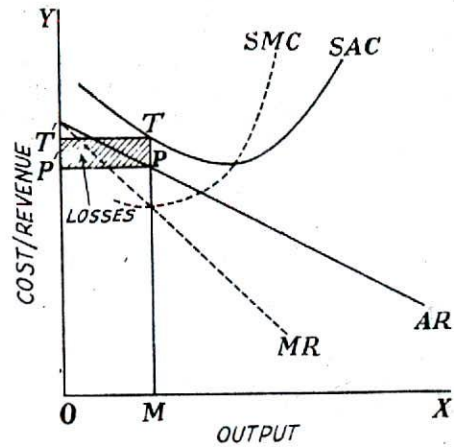
Equilibrium Under Monopolistic
Competition: Short-run (with Losses)
Fig. 29.2

illustrated in Fig. 29.2. Here, the price is OP' (=MP) which is less than the average cost MT. TP is the loss per unit of the output OM (=PP'). Hence, the total loss is represented by the shaded area TPP'T'.

Thus, in the short run, the monopolistically competitive firm may either realise profits or suffer losses.

Long-run Equilibrium of Firm and Group Equilibrium

We have seen above that the firms under monopolistic competition can earn supernormal profits in the short run. But, in the long run, such profits disappear. This is because we assume that entry is free and new firms will enter the industry, if the existing firms are making supernormal profits. As new firms enter and start production, supply will increase and the price will fall, i.e., average revenue curve faced by the firm will shift to the left, and, therefore, the supernormal profits will be competed away and the firms will be earning only normal profits. If, in the short run, firms are realising losses, then, in the long run, some firms will leave the industry so that the remaining firms will be earning normal profits.

Another point which is to be noted in regard to the long-run equilibrium is that **average revenue curve in the long run will be more elastic (i.e., flatter), since large number of substitutes will be available in the long run.** Therefore, in the long run, equilibrium is established when firms are earning only **normal profits.** Now profits are normal only when Average Revenue = Average Cost.

Therefore, **there is equilibrium in the long run under monopolistic competition when**

Average Revenue = Average Cost.

In Fig. 29.3, average revenue curve (AR) is a tangent to the average cost curve (LAC) at P. Therefore, the equilibrium output in the long run is OM and the corresponding price is MP (= OP'). At this point, average cost is also MP and so is average revenue. Therefore, there are no supernormal profits; there are only the normal profits which form part of the cost of production.
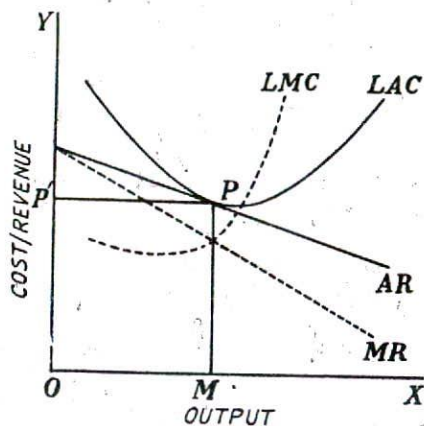
Equilibrium Under Monopolistic
Competition: Long-run
Fig. 29.3

In the long run, therefore, the firm is in equilibrium when output is OM, and the price is MP (= OP').

In the short run there is only one condition of equilibrium, i.e.,

  Marginal Revenue = Marginal Cost.

In the long run, however, both the conditions must hold, i.e.,

  Marginal Revenue = Marginal Cost.
  Average Revenue = Average Cost.

Product Variation Equilibrium

An important problem that a firm under monopolistic competition has to tackle is concerned with product adjustment. This problem does not arise under perfect competition, since the product is homogeneous. But under imperfect competition, there is product differentiation. The product has to be adjusted to consumer's preferences so that the profit is maximised. The product adjustment may take place through an "alteration in the quality of the product itself, technical changes, a new design, better materials; it may mean new package or container, it may mean more prompt or courteous service, or different way of doing business, or perhaps a different location. In some cases, an alteration is specific and definite—the adoption of new design, for instance. In others, a change in the quality of service, it may be gradual, perhaps

unconscious." [4] The choice of the differentiated product will be made on the principle of profit maximisation. In case variety A gives more profit than variety B. the producer will produce more of A and less of B so that he maximises his profit. Thus, a firm operating under monopolistic competition must work out a product equilibrium in addition to the price-output equilibrium. It should also adjust selling cost for maximising profit which we discuss below. Product variation thus means changing the physical characteristics of the product or the conditions under which it is sold.

GROUP EQUILIBRIUM

We have analysed so far the equilibrium of an individual firm under monopolistic competition, i.e., Individual Equilibrium. Let us now study the case of Group Equilibrium. Group equilibrium means price-output adjustment of a number of firms, instead of an individual firm, whose products are close substitutes.

In fact, product differentiation referred to earlier in this chapter creates difficulties in the analytical treatment of the industry because heterogeneous products cannot be added to form the market demand and supply schedules. Chamberlin uses the concept of **'product group'** for industry. The product group includes products which are closely related, i.e. are technological and economic substitutes. *Technological substitutes* are products which can technically cover the same want and *economic substitutes* refer to products which cover the same want and have similar prices. An operational difinition of the product group is *that the demand for each single product be highly elastic and that it shifts appreciably when the price of the other products in the group changes. That is, products forming the 'group' or industry should have high cross and price elasticities.* Product differentiation enables each firm to charge a different price.

In each industry, one can imagine different groups of firms forming an industry of their own. For example, in the automobile industry, a group of firms may be manufacturing light cars and another group making heavy trucks. The firms in the car group may be making various types of cars, e.g., Fiat, Ambassador, Standard cars which are close substitutes for one another but not perfect substitutes or completely homogeneous products because it is a case of monopolistic competition.

Each firm within a group has a monopoly of its own product, yet there is competition among those firms which are producing closely related products. The price-output decision of one firm will affect the decisions of rival firms. The qualitative difference among the produ s of the monopolistically compe-

4. Chamberlin, E. H., *The Theory of Monopolistic Competition*, p. 71.

titive firms results in large variation in cost and demand (AR) curves of the various firms. The demand curves also differ in elasticity. Similarly, the shape and position of cost curves too differ. As a result, there are differences in prices, output and profits of the various firms in the group.

Chamberlin ignores the heterogeneous conditions regarding prices, output, etc., of the various firms for the sake of simplicity of group analysis. He adopts what is called 'uniformity assumption.' In other words, he assumes that demand and cost curves of all the products in the group are uniform. At the same time, differentiation of products is not reduced. Only, it is assumed that the consumers' preferences are evenly distributed among the different varieties and the differences among them are not such as to give rise to differences in cost. That is, the demand curves and cost curves are similar.

Chamberlin introduces another assumption called by Stigler "symmetry assumption," which means that the number of firms under monopolistic competition is large enough to ensure that individual decision regarding price and output adjustment has negligible influence on the rivals. There is thus no possibility of retaliation.

We now proceed to the analysis of group equilibrium subject to the assumptions made above. Within the group, if a firm has successfully designed a popular brand, it will be making supernormal profits but, in the long run, other firms will imitate the design so that extra profits will tend to disappear. This is what happens within the monopolistically competitive groups. But if the group as a whole is making supernormal profits in the short run, outside firms will enter into the group, unless the entry is legally or economically barred. In this way, extra profits will be competed away.

This is illustrated by the following diagram (Fig. 29.4).

Fig. 29.4(a) represents short-run equilibrium and Fig. 29.4(b) the long-run equilibrium. In the short run, the price is OP (= RM), whereas average cost is MN at the output OM where marginal revenue is

equal to marginal cost. Hence there is supernormal profit represented by the shaded area PRNP$_1$. But in the long run, shown in Fig. 29.4 (b), the surplus profit will be competed away. In this diagram, the marginal revenue equals marginal cost at the output level OM$_1$ and the average revenue curve (LAR) is a tangent to the average cost curve (LAC) which means that the average revenue (i.e., price) is equal to average cost and there is no extra profit, i.e., only normal profit is being made.

This situation is similar to the one prevailing under perfect competition. But the differences may also be carefully noted. The main difference is that under perfect competition, the average revenue curve is a horizontal straight line, whereas under monopolistic competition it is a downward sloping curve. The result is that with a U-shaped average cost curve, the equilibrium under monopolistic competition must occur at a smaller output than under perfect competition.

SELLING COSTS

Meaning of Selling Costs

The costs incurred on advertising, publicity and salesmanship are known as selling costs. Selling costs have been defined "as the costs necessary to persuade a buyer to buy one product rather than another or to buy from one seller rather than another."

Obviously, if the markets were perfect, i.e., if the buyers were well informed about the prices and quality, advertising will be a waste. It will not win over any buyer. Advertising will also be unnecessary in a purely competitive market dealing in standardised products. Monopolist also need not spend on advertisement, for there are no rivals. Actually, however, perfect competition and perfect monopoly are rare. Few buyers can be considered connoiseurs of quality or fully acquainted with market conditions. There is a very large number of brands contesting for a buyer's choice. This creates a large

Short run Equilibrium   (a)

Long run Equilibrium   (b)
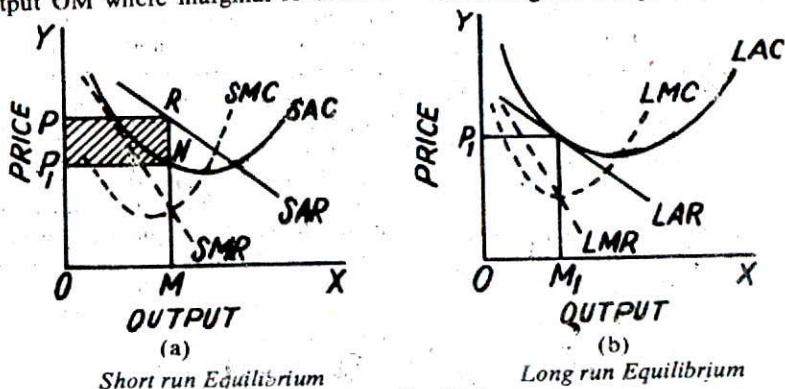
Group Equilibrium
Fig. 29.4

scope for advertisement either to herald a new product or to remind the customers that an old product is still going strong. Advertisement may be **promotional** which gives general information about the industry and promotes its sales. This advertisement is on behalf of the entire industry say, cement industry or life insurance. The advertisement may be competitive when it seeks to push the products of one firm against another.

Selling costs are thus, specially associated with imperfect markets or monopolistic competition, Product differentiation necessitates selling effort.

How Far Are Selling Costs Efficacious?

Advertisement is a very delicate weapon and it is impossible to assess its value. First, it is difficult to generalise. The same expense on advertising may yield a handsome dividend when incurred in a certain manner or under certain circumstances and may prove utterly barren otherwise. This is due to the fact that its success depends almost entirely on its appeal to uniqueness or novelty. When this element is missing, advertisement is a waste.

Secondly, there is no relation between the selling costs and the volume of business secured by a firm.

Thirdly, since advertisement evokes counter-advertisement, selling costs are influenced very much by what the rival businessmen are doing. This competitive advertisement may eat up the profits so that none may benefit except the advertising agencies and the salesmen.

Fourthly, the benefit from selling costs may accrue not only to the firm incurring them but also to its rivals. An advertisement by New India Insurance Company may prepare a person for insurance but he may go in for a policy in the Oriental Insurance Company instead.

Fifthly, advertisement is based on the assumption that a large number of customers are prepared to change their preferences. This may not be the case. Resistence comes from the force of habit. It is not possible to find out how much of the business is due to repeat customers and how much to new customers won by advertisement. In the former case, selling costs should be treated as fixed costs and in the latter, variable costs. Full costs of advertisement should be charged to new business.

Effect of Selling Costs on the Demand Curve

Selling costs (*i.e.*, advertisement and salesmanship) are likely to induce old buyers to buy more and also to attract new buyers. This means an increase in demand. The new demand curve representing an increase in demand will be above the old curve or to the right of it. But it is not sure whether the new curve will have the same elasticity as the old one. It will depend on the buying habits of the new customers. In case they are sensitive to price

changes, it will be more elastic, otherwise less elastic than the old curve. If the new customers are fully and permanently convinced of the superiority of the product, the new curve will be less elastic in the upper segments because price can be safely raised. If, on the other hand, the customers feel they can afford to purchase it only at lower prices, the new curve will be more elastic than the old one in the lower regions.

The main point is that the producers by spending money and effort on advertisement can alter or shift the demand curve. Persuasive advertisement usually results in increasing sales by attracting the attention of a large number of prospective buyers. The aim is to increase the sales of one firm at the expense of the other firms.

The effect of advertisement may be (a) to increase the sales and (b) to make the demand for the commodity less elastic. But the producer is more interested in increasing the sales by shifting the demand curve to the right. If he can lower the elasticity of demand, he can raise the price and thus increase his profit. In case he cannot reduce elasticity, he can increase his sales by lowering the price. "The most reasonable result to expect will be that elasticity of demand will fall, that the volume of demand will increase somewhat at each price and that price and output will therefore both increase as a result of the advertising campaign." [5]

Selling Costs and Equilibrium Output

There are three possible methods of selling a large output of which advertisement is only one; the other two methods are lowering price and improving quality. The intervention of selling costs adds to the difficulty of determining the most profitable output. It is obvious that higher total selling costs will be necessary to sell a larger output at the same price or the same output at a higher price.

In order to ascertain the equilibrium output the following formula may be used:—

Net returns = (Price × Output) — (Production Cost + Selling Cost).

The problem is to find out that output at which the net returns will be the highest. We have already seen that selling costs create a new demand curve. One method of finding out the most profitable output is to regard the selling costs as a fixed cost in connection with that particular demand curve. A diagram may be drawn for such possible selling cost and the demand curve that it creates.

In Fig. 29.5, AR is the average revenue (demand) curve; MR is the marginal revenue curve; PC the average production cost, the shaded area above it represents the selling costs. By adding this to PC, we

5. Stonier and Hague—*A Text-book of Economic Theory*, 1953 p. 196.

get ATUC, *i.e.*, average total unit cost. DP is the net return per unit (Price MP—MD average cost) of the
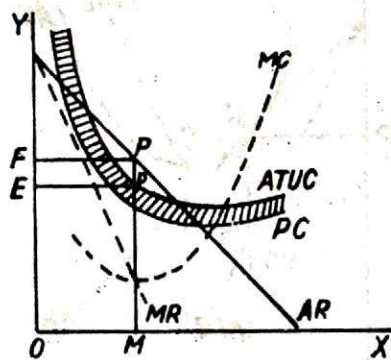
Equilibrium with Selling Costs
Fig. 29.5

output OM (= ED). Thus, area DEFP indicates the maximum net return in this case, *i.e.*, Total revenue OMPF—total cost OMDE.

In the above case, selling cost has been considered as a fixed cost.

Another method is to regard the selling cost as a variable cost required to dispose of the increasing output at the same price. The point of maximum net return will be found by taking different possible outputs and applying the formula given above. For each output, we find the net return by deducting total costs (including selling costs) from total revenue. In this way, we can find out which output will yield the maximum return.

Optimum Selling Costs?

The question arises: how much advertising expenditure will the firm find it worthwhile to incur? Obviously, by spending a certain amount on advertisement a producer gets a certain revenue. A firm will incur extra expenditure on advertising when it finds it worthwhile, *i.e.*, when it brings additional revenue. So long as the marginal revenue exceeds the marginal cost on advertising, the firm will go on increasing the advertising expenditure and it will stop when the additional (marginal) revenue generated equals extra (marginal) cost incurred. Profit will be the maximum in that position. In order to find the most profitable sales promotion programme, the monopolistic competitor identifies the cost and revenue curves associated with the various sales promotion programmes and on this basis he finds out that particular level of selling costs which would maximise his profit and he adopts this for his purpose.

Following diagram (Fig.29.6) illustrates this.

In this diagram, before advertisement is done AR₁ is the average revenue curve, AC is the cost

curve, OP is the price and OM the equilibrium amount. Suppose Rs. 1,000 are spent on advertise-
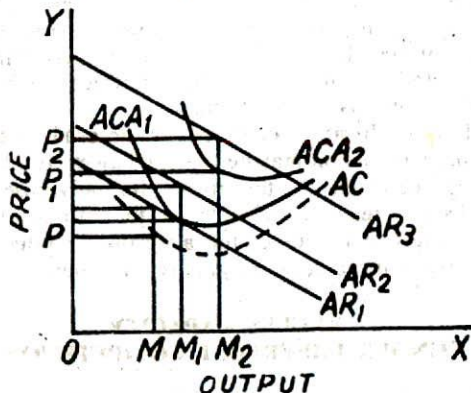
OUTPUT
Amount of Selling Costs
Fig. 29.6

ment. This increases the demand from AR₁ to AR₂. The average cost curve ACA₁ includes now Rs. 1,000, the cost of advertisement. Now the equilibrium will be at the price OP₁ and the amount OM₁. This again is the profit-maximising position. Here the output is larger and the price higher than in the original equilibrium. But the important point to note is that the firm does not bother about the price or the size of the output; it is only concerned with maximising of profit. That is, the total revenue minus total cost must rise by more than Rs. 1,000 when the selling costs amount to Rs. 1,000. Since profits have increased, the firm will be tempted to increase the advertisement expenditure. The profits will be the maximum when, as mentioned before, the marginal revenue equals marginal cost. This situation is represented in the diagram where AR₃ is the average revenue curve, ACA₂ is the average cost curve, OP₂ is the price and OM₂ is the output. Beyond this, further expenditure on advertisement will reduce profit since it will add more to the cost than to the revenue. Thus, for a firm under monopolistic competition, corresponding to different levels of selling costs, there are series of average revenue curves and average cost curves. The producer has to select that set of cost and revenue curves where the profits are the maximum.

Increased Selling Costs *vs.* Price-Cutting

We have mentioned before that apart from improving quality, there are two methods of increasing the sale or output, *viz.*, reducing the price or increasing selling costs (*i.e.*, spending more money on advertisement and salesmanship). Of these two alternatives, which is better?

It is obvious that, from the point of view of the buying public, price reduction is much better, whereas advertisement, at any rate some advertisement, may be regarded as an economic waste.

From the point of view of the individual busi-nessman, advertisement is better than price-cutting. Advertisement can be stopped if it does not produce results, whereas it is not wise to raise the price again once it has been reduced. Also, price-cutting is regarded as professionally unethical, whereas nobody objects to advertisement.

Further, business captured by the crude method of price reduction may be snatched away by a larger price reduction by the rivals. But advertisement seeks to create a delusion in the minds of the customers in favour of the advertised product. To the extent it succeeds, the gain is permanent.

EXCESS CAPACITY
UNDER IMPERFECT COMPETITION

Discussion of monopolistic competition by Chamberlin and Joan Robinson have shown that firms under imperfect competition operate with excess capacity. According to these economists, a firm under monopolistic competition or imperfect competition, produces an output in the long-run equilibrium which is less than socially optimum or ideal output. In other words, they do not produce that level of output at which long-run average cost is minimum. This will happen when the firms operate at a point on the falling portion of the long-run average cost curve. A firm under monopo-listic competition attains long-run equilibrium when the demand curve (or average revenue curve) facing it is tangential to the long-run average cost curve so that it may earn only normal profits. Since they are operating on the falling portion of the long-run average cost curve, the firms can reduce their average cost, (and hence price) by expanding their output to the minimum point of the long-run average cost curve. But they do not increase their output, because their profits have already been maximized at the level of output smaller than at which their long-run average cost would be mini-mum. This happens at a point where equality between marginal revenue and marginal cost has been attained.

It is clear that productive resources of the com-munity are fully utilized only when they are used to produce that level of output which brings down the long-run average cost to the lowest point. But the monopolistic firms produce less than that level of output which is socially optimum or ideal output. This is quite different from what happens under perfect competition when the firms operate at the minimum point of long-run average cost curve. Thus, the actual long-run output of the firm under monopolistic competition falls short of what is produced under perfect competition which can be considered the socially ideal output. This gives the measure of excess capacity which lies unutilized under imperfect competition.
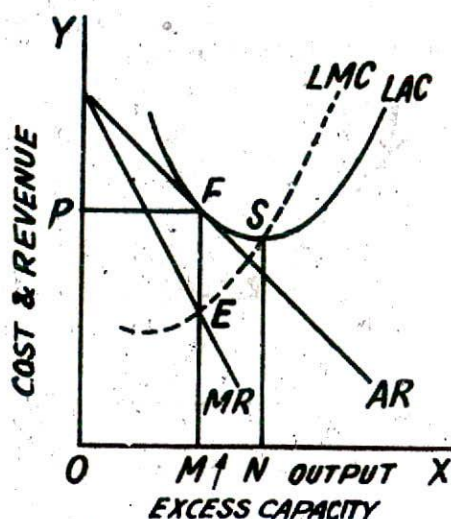
EXCESS CAPACITY
Production of Ideal Output under
Imperfect Competition
Fig. 29.7

The two figures (Fig. 29.7 and Fig. 29.8) show the existence of excess capacity. Fig. 29.8 represents the long-run position of a perfectly competitive
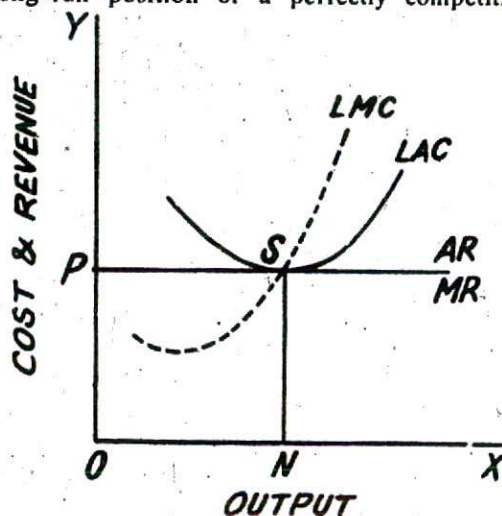
Ideal Output under Perfect Competition
Fig. 29.8

firm. The firm is in long-run equilibrium at the level of ON output where the long-run average cost is minimum. At this point, Price = MC = AC, which means that the double condition of long-run equili-brium is satisfied. This represents the socially ideal output.

The operation of the firm under monopolistic competition is shown in the figure 29.7. In this case, the long-run equilibrium is achieved at OM output at which the marginal revenue is equal to marginal cost and price is equal to average cost. Here average

revenue curve AR is tangential to average cost curve AC at point F corresponding to output OM. It can be seen that at output OM, average cost is still falling and it continues to fall upto ON and thus reduce its long-run average cost to the minimum. Hence, the ideal output is ON where the long-run average cost is minimum. This means that this firm is producing MN quantity less than the ideal output. Hence MN output represents excess capacity which emerges under monopolistic competition.

It may be noted that this concept of excess capacity refers only to the long-run, because in the short run under any type of market structure (including perfect competition), there can be all types of departures from the ideal output showing incomplete adjustment to existing market conditions. It may also be noted that excess capacity arises because under monopolistic competition, the average revenue curve or the demand curve can be a tangent to a U-shaped average cost curve only at the latter's falling portions. This happens under monopolistic competition because under it the demand curve slopes downwards. On the other hand, under perfect competition, it is only the horizontal demand curve or average revenue curve which can be tangent to a U-shaped average cost curve at the latter's minimum point. It follows, therefore, that the greater the elasticity of average revenue (or demand) curve confronting a firm under monopolistic competition, the less will be the excess capacity, and vice versa. On the other hand, under perfect competition when a firm faces a perfectly elastic demand curve, there can be no excess capacity.

Chamberlin, however, considers that this 'competitive ideal' cannot be considered as 'ideal' under monopolistic competition. He thinks, on the other hand, that under monopolistic competition, where there is product differentiation and free entry and active price competition, there is a different 'ideal' output.

The concept of excess capacity under monopolistic or imperfect competition has been criticised by some economists, especially by Harrod and Kaldor. According to Harrod, there is inconsistency in the description of excess capacity by Chamberlin and Mrs. Robinson arising from the fact that the entrepreneur is shown to be using short-run marginal revenue curves and a long-run marginal cost curve to determines his optimal output and size of the plant. Kaldor thinks that the excess capacity, which will arise in some circumstances, will be very much less than that made out in Chamberlin's version of the excess capacity under monopolistic competition. According to Chamberlin's analysis, excess capacity arises because new firms enter into industry so that the demand curves facing the firms are pushed to the position where they become tangential to the long-run average cost curve. Since there is absence

of price competition it results in the reduction of output of individual firms and rise in costs which represents excess capacity or waste of social resources. Kaldor is of the opinion that high degree of excess capacity under monopolistic competition has been shown to arise on account of the unrealistic assumptions made explicit or implicity by Chamberlin.

CRITIQUE OF MONOPOLISTIC COMPETITION

Effects of Monopolistic Competition

Based on the above analysis, we may sum up the effects of monopolistic competition as under:—

(i) Unlike pure competition, under monopolistic competition, output is slightly less and the prices slightly higher.

(ii) Under monopolistic competition, the consumers have the pleasure of enjoying the use of wider range of goods in types, design and quality.

(iii) The firms engage in high pressure salesmanship, the expenditure on which does not confer on the community proportional benefit.

(iv) Under monopolistic competition, inefficient firms are helped to carry on.

This brings us to the wastes of imperfect competition.

Wastes of Monopolistic Competition

Some other evils, besides those noted under monopoly, are associated with imperfect competition. Superficially, these are sometimes considered "wastes of competition" but they can more fitly be described as "wastes of monopolistic conditions"[6] or of imperfect competition. They are mostly due to what are technically called irrational buyers' preferences, i.e., buyers' preference for a commodity or a shop due not to any real differences in quality but to irrational factors like habit, prejudices or ignorance. Some of these wastes are given below:—

(i) One of the wastes of imperfect competition is the restriction of output so that price is kept higher than the marginal cost. The excess of price over the marginal cost represents the real extra burden on the community. It is not the total amount of profit that pinches but setting too high a price is perhaps the greatest evil of imperfect competition.

(ii) Expenditure on competitive advertisement is usually regarded as a waste of competition. In fact, it is due not to perfect but imperfect competition. If competition is perfect, there is no need for such expenditure to be incurred, because then each firm can extend its sales by lowering its price only a little. Under imperfect competition, much larger reduc-

6. Meade—*Economic Analysis and Policy*, pp. 165-68.

tion of price will be necessary to overcome the irrational preference of the consumers. It pays, therefore, to spend money on advertising and thus persuading the consumers that the product of the advertising firm is better than that of its rivals. Such expenditure is a waste from the point of view of the community.

(iii) Another similar waste is "expenditure" on cross-transport. A firm in the north of India may be selling a commodity to the consumers in the south. At the same time, the same (or substantially the same) commodity is perhaps being sold by a firm located in the south to consumers living in the north. This state of affairs is also due to the absence of perfect competition, which in its turn is due to irrational buyers' preferences. If competition were perfect, the firms in the north would have attracted all the buyers in the north and the firms in the south all the buyers there, by slightly lowering the price. This would have saved the cost of transport. As it is, the firms deem it worthwhile spending considerable sums on advertisement and transport cost, rather than reduce the price sufficiently to attract the neighbouring consumers with irrational preferences.

(iv) A third waste of imperfect competition is the failure of each firm in an industry to specialise in the production of those things for which it is best suited. Under perfect competition, such a specialisation would naturally take place, provided it led to any real economies. Under conditions of imperfect competition, since each firm has to spend money on advertisement or to sell at considerably lower prices in order to attract customers from its rivals, "each firm may find that it pays it better to produce varied assortment of types and qualities to sell to its own particular customers, rather than face the cost of attracting a large number of customers for one type of product alone."

(v) Still another waste of imperfect competition has already been noted. This is that, under such conditions, the efficient firm which can produce at lower cost may fail to drive out the inefficient ones as would happen if competition were perfect. If competition is perfect, the efficient firm (or firms) will increase output until the price comes down to the marginal cost of production at which the inefficient firms will not be able to supply. But, if competition is imperfect and the efficient firm has to spend considerable sums to attract consumers from inefficient rivals, or it has to lower its price considerably to achieve the same end, it might prefer not to drive out the inefficient firms, even though the latter were charging a price higher than the marginal cost of the efficient firm. Thus, valuable resources are wasted because of excess capacity resulting in idle plant and manpower in each firm.

(vi) Finally, imperfect competition may prevent that standardization of commodities which is essential if the most efficient methods of production are to be adopted. Different types of cars may be produced by a large number of firms each at a high cost of production. If only a few designs were produced, cost per unit could be lowered considerably due to the economies of large-scale production. Under imperfect competition, such large producing units would emerge. Under imperfect competition, no producer would take the risk of producing, any particular design on a large scale, since the cost of attracting buyers from his rivals would outweigh the economies of scale obtained by producing the large output.

(vii) Monopolistic competition has also been criticised on the ground that the firms under this type of market operate with excess capacity.

Conclusion

Thus, under imperfect competition, producers incur losses, valuable resources of the community are wasted and the consumers suffer from too high prices.

MONOPOLISTIC COMPETITION: AN APPRAISAL

The importance of Chamberlin's contribution to the theory of pricing cannot be denied. He has introduced product differentiation and selling strategy as the two additional variables in firms' decision-making process. Also, his model has provided some sort of solution to the dilemma of falling costs.

But we may also notice the criticisms levelled against Chamberlin's theory of monopolistic competition: (i) The assumptions of product differentiation and of independent action by the rivals are inconsistent. Actions of competitors, whose products are close substitutes, are well known to the firms. (ii) The assumption of product differentiation is also inconsistent with the assumption of free entry. Product differentiation and brand loyalty of the buyers is a barrier to the entry of new firms. (iii) Product differentiation destroys the very concept of industry. This makes each firm an industry because hetrogeneous products cannot be added to get the industry demand supply curves. (iv) Chamberlin's 'heroic model' cannot be accepted as an approximation to the real world in which demand and costs are different among the firms giving rise to cluster of prices rather than a unique price. (v) Finally, the model assumes that the products should be close substitutes with high price and high cross elasticities but it is not clear what should be the exact value of elasticities to put the products in the same group.

| 30 | OLIGOPOLY AND DUOPOLY |

We have so far discussed where there is a very large number of producers supplying a market as under perfect competition, or a single monopolist, an individual or a single group of individuals, dominates the entire market, or there are many producers as in imperfect competition but not as many as in perfect competition.

But other situation may also arise in the real world. One is that there may be two monopolists instead of one who share the monopoly power. This is called **Duopoly.** The other is when more than two or a few sellers are found in a monopolistic position. This is called **Oligopoly.**

Important characteristics of an oligopolistic situation are: (a) Every seller can exercise an important influence on the price-output policies of his rivals. (b) Every seller, therefore, is so influential that his rivals cannot ignore the likely adverse effect on them of a given change in the price-output policy of any single manufacturer. (c) This rival consciousness, or the recognition on the part of the seller of the fact of interdependence is the most important feature of oligopolistic situation. (d) The demand curve under oligopoly is indeterminate as we shall see, because any step taken by his rivals may change the demand curve. It is more elastic than under simply monopoly and not perfectly elastic as under perfect competition.

As compared with perfect competition, the number of firms in an oligopoly is much smaller. Oligopoly differs from monopoly and monopolistic competition in this that, in monopoly, there is a single seller; in monopolistic competition, there is quite a large number of them; and in oligopoly, there is only a small number of sellers.

We discuss these two market situations at some length below:

DUOPOLY

Duopoly may be of two types: (a) Duopoly

without product differentiation and (b) Duopoly with product differentiation.

Duopoly Without Product Differentiation

Under duopoly the simplest cases will be those where the two monopolists are supposed to be selling an identical commodity and there is no product differentiation. Very likely there will be a collusion between the two. They may agree on a price, or assign quotas or divide the territory in which each is to market his goods. This will specially be the case if their respective cost curves are identical or nearly so, and if the demand is stable and less elastic. Obviously, this collusion creates conditions almost analogous to a monopoly and the price determination will be similar to that under monopoly.

In case, however, there is no agreement between the two, a constant price war will be the most probable consequence. The important factors to be considered then would be the costs and gains in driving out the rival, the relative sizes of the two firms, the demand elasticity and mobility of the purchasers, the promptitude with which the rival reacts to changes in the other's policy and the extent to which price concession can be kept secret, and so on.

If there is no product differentiation and goods are identical, the consumers are indifferent between the two producers and the same price must be charged by both in the long run, otherwise the one charging more will not be able to sell any. They must fix a price as if they were a single monopolist rolled in one. Only in that way they will be maximising profits.

In case there is a price-war between them, they will be able to earn only normal profits as under perfect competition. If their costs are different, the one with lower costs will squeeze out the other and a simple monopoly would be established. The best

course for the duopolists will be to fix the monopoly price and share the market and profits.

It is possible that, in the short run, duopoly price may be lower than the competitive price, none of the producers earning normal profit. In the long run, this price may be somewhere between the monopoly price and the competitive price.

Duopoly With Product Differentiation

When there is product differentiation, each producer has his own clientele and goodwill. There is no fear of immediate retaliatory measures by the rivals, if one producer changes his price-output policy. There is less danger of price-war. There will be no agreement between them. Since products are not similar, the firm with better products can earn supernormal profits.

OLIGOPOLY

Oligopoly Without Product Differentiation

Under **oligopoly**, the pricing theory is fundamentally the same as in duopoly with this difference that the larger the number of firms the greater will be the differences in marginal costs and more remote will be the possibility of collusion or agreement, whether tacit or explicit. The element of predictability as regards the proper scale of advertisement, research investment and returns is almost missing. The temperaments of entrepreneurs, whether pessimistic or optimistic, make the situation still more complicated and obscure. Since they all deal in a standardised product and each is producing a considerable portion of the total output, the price and output policy of each is likely to affect the others appreciably, but none can foretell precisely how. "The price which will be fixed in oligopoly without product differentiation is thus indeterminate but is likely, in general, to be lower, the larger the number of producers, until in the end there are enough for a perfectly competitive equilibrium to be reached."

Oligopoly With Product Differentiation

In case there is product differentiation, monopoly agreements are even less likely. Since products are not similar, any producer in oligopoly can raise or lower his price without any fear of losing customers or immediate reactions from his rivals. Cut-throat competition is unlikely. However, keen rivalry among them may create conditions of monopolistic competition. The price, in the long run, may settle at a level between the monopoly price and that in cut-throat competition.

Stability of Price under Oligopoly

It is often noticed that price under oligopoly is stable. It is neither much responsive to changes in demand nor to changes in supply. For instance, if demand increases, no firm will venture to raise the price for fear that other firms may not raise the price and it may lose the market. Nor will it lower the price for the fear that the other firms may also lower their price and deprive it of any initial advantage.

Similarly, changes in costs, too, do not much affect price and output under oligopoly. For instance, if wages have gone down, each firm may like to reduce the price but it is not sure if others too will not lower theirs. In competitive industry, action of no single firm can affect the conditions in the industry, for the number of firms is very large. But under oligopoly, the number of firms is very small and any step taken by any one firm is likely to produce some reaction on the others. As Tarshis remarks, "Thus it is quite possible for demand and cost to change frequently and yet to produce no changes, or at any rate very few changes, in price. Thus, the existence of oligopoly accounts for some of the price inflexibility that characterises our economy."

The oligopolist avoids experimenting with price-changes. He knows that if he raises the price, he will lose his customers and if he lowers it he will offend his rivals. He has a clientele of his own when there is product differentiation. Why should he experiment? He is, therefore content to leave the price and output as they are.

KINKY DEMAND CURVE

It is impossible to find a single generalised solution to the problem of oligopoly pricing. This is because of the difficulty of knowing the exact position of the demand curve facing a firm under oligopoly. This in turn is due to the fact that the effect of a given price change by a seller on the demand for his product depends very much on the reactions of his rivals and, as we explained earlier, rival consciousness is a basic characteristic of oligopolistic situations.

As for the possible reactions of the rivals, there can be any number of hypotheses. Under some circumstances, a price cut by a seller may pass unnoticed by his rivals; at other times, it may invite immediate retaliation, so that the position and the shape of the demand curve of a firm under oligopoly will vary with the hypothesis that we adopt about the reaction to its moves on the part of the rival firms.

There is, however, one particular shape of demand curve under oligopoly which has become very popular, i.e., the kinky demand curve. This curve is drawn on the assumption that the kink in the curve is always at the ruling price. Taking the ruling price as given, it assumes that a rise in price (beyond the ruling price) on the part of a given firm under oligopoly, will not invite retaliation from the rivals, i.e., they will not come forward with a price

increase of their own to neutralise the effects of price increase by the first seller. Rather, they will allow him to raise his price and lose customers to his rivals, so that the upper part of the curve is more elastic than the part of the curve lying below the kink. This is because a price cut (below the ruling price) will invite immediate retaliation from the rivals who wish to protect their own sales. The result will be that if a firm under oligopoly lowers its price, it cannot push up its sales very much because the rival firms also follow suit with a price cut, so that there are no customers to be drawn from the rivals. Hence the lower part of the demand curve is less elastic than the upper one.
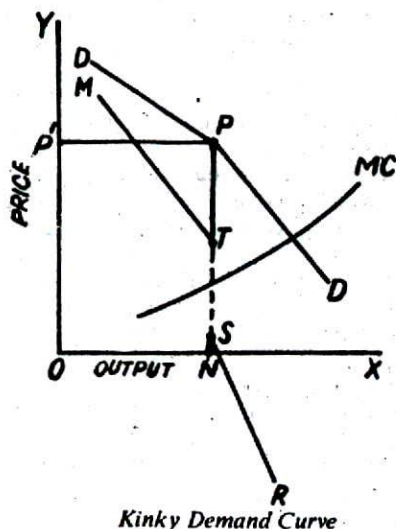
Kinky Demand Curve

Fig. 30.1

Having drawn the demand curve, we can draw the corresponding marginal revenue curve (MR) (Fig. 30.1). We shall notice that there is a discontinuity in the marginal revenue curve just below the point corresponding to the kink. Next we can draw the marginal cost curve (MC). The equilibrium of the firm will be at the point where marginal revenue equals marginal cost. We shall further notice that, because of discontinuity in the marginal revenue curve, shifts in the marginal cost curve between the points T and S will not alter the equilibrium position as regards output and prices. The firm will be in equilibrium at the output ON. This helps to explain an often observed phenomenon under oligopoly described earlier that despite considerable variations in costs and demand, the price under oligopoly remains unchanged.

The kinky solution as given above is only one of the possible solutions of oligopoly pricing and a number of variations are possible. This solution, therefore, cannot be accepted as a generalised solution. Indeed it is no solution at all, because we start with the assumption that the kink is always at the ruling price, which is supposed to be, therefore, already known. But if the price is already known, what is there to be investigated? Of course, the kinky solution offers an explanation of 'Sticky' prices under oligopoly, but this can be explained in many other ways also and we need not, therefore, labour too much on kinky solution for this purpose alone.

PRICE LEADERSHIP UNDER OLIGOPOLY

In an oligopolistic situation, there are more than two or a few sellers who are able to exercise monopolistic influence. In such a market situation, we generally find that there exists what is called the 'price leadership'. Under price leadership, one firm assumes the role of a price leader and fixes the price of the product for the entire industry. The other firms in the industry simply follow the price leader and accept the price fixed by him and adjust their output to this price. The price leader is generally a very large or a dominant firm or a firm with the lowest cost of production. It often happens that price leadership is established as a result of price war in which one firm emerges as the winner.

Thus, we find that in an oligopolistic market situation, it is very rare that prices are set independently and there is usually some understanding among the oligopolists operating in the industry. This understanding or agreement may be either tacit or formal. In the case of a formal agreement, the oligopolists agree to observe some rules of conduct as regards price, output, *etc.* They may have a written agreement which may also provide for violation of agreement.

However, generally the agreement is more tacit than formal. The tacit agreement implies that there are no consultations or discussion; the oligopolists have only an understanding among themselves and follow a uniform and agreed policy with regard to price, output, *etc.* It is this tacit agreement which is usually a feature of price leadership. That is, under price leadership there is no formal agreement or setting up of an agency to control and regulate the activities of the firms in the industry. Some times, however, price leadership may emerge from a formal agreement among the rival firms in which a leader is chosen whom the other firms in the industry agree to follow in setting the price.

Types of Price Leadership

There are several types of price leadership. The following are the principal types:—

(a) **Price Leadership of A Dominant Firm.** Under this type of price leadership, it is found that there is generally one firm, among the firms operating in the industry, which produces the bulk of the product of the industry. By virtue of this position, it is able to

dominate the entire market. It sets the price and the other firms simply accept this price. The other firms are not in a position to exercise any influence on the market price. Naturally the dominant firm, considering its own interest, fixes a price so as to maximize its profits. The other firms have to adjust their output to the price so fixed by the dominant firm.

(b) **Barometric Price Leadership.** Under this type of price leadership, an old, experienced and the largest firm assumes the role of a leader, but undertakes also to protect the interests of all firms instead of merely promoting its own interest. In a way it acts as the custodian of firms operating in the industry. It fixes a price which is found to be suitable for all the firms in the industry. This price is fixed by taking into consideration the market conditions with regard to the demand for the product, cost of production, competition from the rival producers, *etc.* Since the interest of all firms are protected by this dominant firm, all the firms in the industry are only too willing to follow the price leader.

(c) **Exploitative or Aggressive Price Leadership.** In this case, one big firm comes to establish its supremacy in the market by following aggressive price policies. This firm compels other firms to follow it and accept the price fixed by it. In case the other firms show any independence, this firm threatens them and coerces them to follow its leadership with the result that the price set by this firm comes to be accepted, willingly or unwillingly.

Price-output Determination Under Price Leadership

Economists have developed various models concerning price-output determination under price leadership on the basis of certain assumptions regarding the behaviour of the price leader and his followers. We take a simple case here to show price-

Price-output Equilibrium Under
Price Leadership
Fig. 30.2
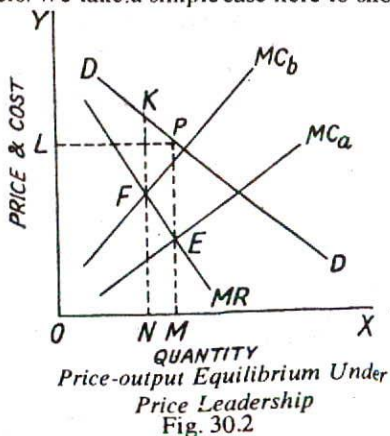
output determination under price leadership on the following assumptions:— (a) There are only two firms A and B and firm A has a lower cost of

production than B; (b) the product of the firms is homogeneous or identical so that the consumers are indifferent as between the firms; (c) both A and B have equal share in the market, *i.e.*, they are facing the same demand curve which will be half of the total market demand curve.

The preceding diagram illustrates price-output determination in this case subject to the assumptions given above.

In this figure, DD is the demand curve facing each firm which is half of the total demand curve for the product, MR is the marginal revenue curve of each firm. MC_a is the marginal cost curve of firm A and MC_b is the marginal cost curve of the firm B. Since we have assumed that the firm A has a lower cost of production than the firm B, MC_a is drawn below MC_b.

Let us take the firm A first. A will be maximizing its profits by selling output OM and setting price MP, because at the output OM its marginal cost is equal to its marginal revenue. As regards the firm B, the profits will be maximum when it sells ON output and fixes NK price, because at this output its marginal cost is equal to its marginal revenue. It can be seen that the profit-maximizing price MP of the firm A is lower than the profit-maximizing price NK of the firm B. The two firms will have to charge the same price since the products of the two firms have been assumed to be homogeneous. This means that the firm A, whose price MP is lower, will dictate the price to the firm B whose profit-maximizing price NK is higher. In case the firm B refuses to fall in line, it can be ousted by the firm A which will be charging the lower price. This shows that in this situation, the firm A is the price leader and the firm B has to follow it.

It can also be seen that although the firm B is compelled to follow A and has to charge the price MP (which is lower than its own profit-maximizing price NK), it will produce and sell output OM like the firm A, because at the price MP, it can also sell OM output like firm A since the demand curve DD facing each firm is the same. Thus, both firms A and B will charge the same price MP and sell the same output OM. But whereas the firm A, the price leader, will be able to maximize its profits by selling OM output and charging MP price, the firm B will not be able to do so because the price MP is lower than its profit-maximizing price NK. Hence the profits earned by firm B will be smaller than the profits earned by the firm A, because the firm B has higher cost of production.

Difficulties of Price Leadership

In the real world, the price leadership does not operate smoothly. Instead, it has to face certain difficulties:

(a) One difficulty is that the price leader is not

able to assess correctly the reactions of his followers. The rival firms may not follow its lead

(b) The rival firms may secretly charge lower prices when they find that the price leader has fixed unduly higher price. In this way, they may seek to increase their share of the market without challenging the price leader openly. The price-cutting devices generally are: offer of rebates, favourable credit terms, 'money back' guarantees, after-delivery free services, easy instalment sales with low rates of interest and liberal entertainment given to the buyers. In this way, the price leadership is rendered infructuous.

(c) The price leader has to face another difficulty, when it finds that the rival firms are indulging in 'non-price competition' to increase their sales even though they charge the price set by the price leader. These 'non-price competition' devices include advertising and other methods of sales promotion like improvement of the product besides the secret price-product concessions mentioned above.

(d) When the price leader fixes a high price, there is an inherent tendency on the part of the rival producers to make secret price-cuts and thus adversely affect the sales of the price leader. The high price set by the price leader may also attract new entrants into the industry and these new entrants may not accept his leadership.

(e) Finally, the differences in cost of production also pose a problem. If the cost of production of the price leader is higher on account of which he fixes a high price and the rival producers have lower cost of production, they will have no difficulty in under-cutting the price. On the other hand, if the price leader has a lower cost, he will set a low price which may not suit his rivals. This will antogonize them and induce them to break his leadership.

COLLUSIVE OLIGOPOLY

There can be a collusion among the oligopolists operating in an industry. Under this situation, the oligopolists arrive at a tacit or a formal agreement on a uniform policy as regards price to be charged. When the agreement is formal, the oligopolists form what is known as a cartel.

The collusive oligopoly may take various forms. An extreme form of collusion is when the firms entering into an agreement surrender completely their rights of price-output determination to a central agency. In this way, they secure collectively maximum profits for themselves. The total profits are distributed among the member firms in agreed proportions which may not be necessarily in proportion to the output quota assigned to each firm. The total cost is sought to be minimized by asking the firms of the cartel to produce such separate outputs as to make their output costs equal.

In the real world, formation of perfect cartels is not very common even when their formation is not legally prohibited. In actual collusion, the agreement is only on the price which is generally the joint-profit maximizing price and the member firms are free to produce and sell the output which will maximize their individual profits subject to the fixed agreed price. Each firm will be able to earn profits on the basis of the output produced and sold by it and the costs incurred.

GAME THEORY AND OLIGOPOLY BEHAVIOUR

John von Neumann and Oskar Morgenstern's 'Theory of Games and Economic Behaviour' represents a remarkable new development in economic theory. The aim of the game theory is to determine rational behaviour of 'players' (or business men) whose interests are mutually dependent on one another's decision. Their object was ".... to find the mathematically complete principles which define rational behaviour for the participants in a social economy, and to derive from them the general characteristics of that behaviour. . . . The immediate concept of a solution is plausibly a set of rules for each participant which tell him how to behave in every situation which may conceivably arise."

By 'game' we mean any situation in which the interests of the participants conflict. Their gain is inter-dependent because decision of the one affects the other. While taking a decision each party must consider what probably will be the decision of the other so that he may make a choice most profitable to himself. This is what usually happens in a game of chess or cards. This is applicable to situations arising in an oligopoly.

The two common games are the "constant-sum" game in which the participants take share or the 'zero-sum' game in which the winnings of one are matched exactly by the losses of the other.

We give here an illustration of the 'constant-sum' game. Suppose the total Indian demand for cars is shared by the two manufacturers, of the Ambassador and the Fiat. Suppose they want to choose for their next model the number of headlights. The table on the next page gives the choices and Ambassador's share of the market:

Ambassador's four choices are given vertically and Fiat's four choices horizontally.

If Ambassador chooses one pair of headlights and Fiat 3, the Ambassador will capture 45 per cent of the market. While deciding, Fiat will focus attention on the lowest in the row. Corresponding to choice of one, 45 is the lowest number in the row and it comes under 3. That is why Fiat chooses 3, so that it gives Ambassador the lowest share in the market. The

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1. John von Neumann and Oskar Morgenstern—*Theory of Games and Economic Behaviour*, 1953, p. 31.

lowest numbers in each row are called "row minima". If Ambassador selects 4, Fiat will decide on 2,

Ambassador's Share of the market

Ambassador's choice	Fiat's choice			
(Pairs of headlights)	(Pairs of headlights)			
	1	2	3	4
	(Percentage share)			
1	60	50	45	60
2	76	60	50	55
3	75	60	55	65
4	60	40	45	50

so as to give Ambassador only 40 per cent, which is the lowest number in the row against 4. This shows the actions and reactions on the part of the participants.

In real life, things are not so simple. So many other factors may enter the choice and the number of participants may also be more than two. All the same, the illustration shows the general principle.

EFFECTS OF OLIGOPOLY

We may mention, in a summary way, the following economic effects of the oligopolistic markets which we can derive from the above analysis: —

(i) **Small Output and Higher Prices.** As compared with perfect competition, oligopoly results in the restriction of output and charging of higher prices.

(ii) **Prices Exceed Average Costs.** Owing to restrictions, partial or complete, on the entry of new firms, the prices fixed, under oligopoly, are higher than the average cost. The consumers have to pay more than is necessary to retain the resources in the industry. The resources of the economy cannot move into the making of products desired more by the consumers from those where they are desired less. In other words, the economy's productive capacity is not utilised in conformity with the consumers' preferences.

(iii) **Lower Efficiency.** There is no tendency, under oligopoly, for the firms in the industry to build optimum scales of plant and operate them at the optimum rates of output. They do not, therefore, attain maximum potential economic efficiency. This is so because the firm's output depends on the quota or the share of the market allotted to it or on its judgment as to the future behaviour of marginal revenue and marginal costs.

(iv) **Selling Costs.** In order to snatch markets from their rivals, the oligopolistic firms engage in aggressive and extensive sales promotion effort by means of advertisement and by changing the design and improving the quality of their products. The resources employed in sales promotion must be regarded as wasted, since they do not add to the consumers' satisfaction.

(v) **Wider Range of Products.** As compared with pure competition or pure monopoly, differentiated oligopoly places at the consumers' disposal a wider range of commodities. To this extent, it promotes consumers' welfare.

(vi) **Welfare Effect.** Under oligopoly, since output does not generally correspond to the minimum long-run unit cost, more units of resources per unit of output are utilised than it is necessary. Also, price is higher than both AC and MC. Vast sums of money are poured into sales promotion to create quality and design differentials. Hence, from the point of view of economic welfare, oligopoly fares fairly badly. The oligopolists push non-price competition beyond socially desirable limits.

Conclusion. Oligopoly shows poor performance from all angles. For the participants it is an awkward organisation, because they can neither avail of individual opportunities as in perfect competition nor building up an efficient money-making organisation as in a monopoly. It is also unresponsive to market changes because (a) they are not interested in short-run condition and (b) they are anxious not to spoil their mutual relations for a temporary advantage. In the absence of prompt transmission of market information through price change, the consumers' response is also weakened. They do not know whether to buy more when the products are plentiful or less when they are scarce. The oligopolists also have the unpleasant experience of wasteful fluctuations in their sales and output. Besides, there is huge wasteful expenditure on advertisements. In the U.S.A. the total bill on advertising by industries is $ 12 billion a year, which is 5 per cent of the value of their products and 1/30th of the entire national income. It has all the drawbacks of a monopoly in addition to rigidity and wasteful competition peculiar to itself.

EVILS OF OLIGOPOLY

There is generally a continuous price war which finally results in disastrously low level of prices. When some of the producers find themselves at an advantage, they will push up the prices creating an anomalous and discriminatory pattern of prices charged from the consumers. Such cut-throat competition in industries characterised by heavy overheads and increasing costs proves ruinous to all producers.

Realising this, they may tacitly or explicitly enter into price agreements; which may result in the exploitation of the consumers. A tendency to earn a fair return on past investments, resulting in the excessive plant capacity, is detrimental to con-

sumers' welfare, because they face scarce output and high prices. Hence, cut-throat competition may be, essential to liquidate excess capacity through losses or sub-normal profits.

Unlike perfect competition, under which price falls when demand decreases, output remaining the same, in oligopoly, prices stay firm, and only output varies resulting in idle plants. This is bad for the society and bad for the consumers.

Remedies. Government regulation is necessary (a) to pull down barriers to the entry to new firms, (b) to frown on collusions to maintain prices and restrict supply, and (c) to break big firms or to prevent them from becoming bigger.

APPENDIX
DUPOLY MODELS

Cournot Model

The following diagram illustrates the Cournot model. It shows how A and B producers share the total market and adjust output (not prices) and how they maximise their profit.

Fig. 30.3

In this diagram (30.3) SB is the total demand. Let the unit cost be zero i.e. MC = O. Therefore MR is also zero, MR is zero at A

Before B enters the market, A produces $OA = \frac{1}{2}$ OB. The price is OC giving maximum profit OAPC. Then B enters the market and produces AH i.e. $\frac{1}{4}$ AB, the remaining market, or $\frac{1}{4}$ OB. The price falls from OC to OZ. B gets total profit AHQP. A's profit falls from OAPC to OARZ, the total profit being OHQZ. When B produces AH which is $\frac{1}{4}$ of the whole, the total output left for A is $\frac{1}{2}(1-\frac{1}{4}) = \frac{3}{8}$. What is left over by A and which now B produces is $\frac{1}{2}(1-\frac{3}{8}) = 5/16$. A may now react by producing $\frac{1}{2}(1-5/16)$ i.e. 11/32. This process will continue till equilibrium output and price are achieved. As more and more firms enter, they will produce output approaching the competitive output. If the number of firms goes up to N they will produce $\frac{(N)}{N+1}$ OB.

Edgeworth Model

The basic difference between this model and the cournot model is that in Cournot model, the output (and not the price) of the rival firm is assumed to remain unchanged. Here the rival firm is supposed to

keep the price unchanged.

The following diagram (Fig. 30.4) illustrates the situation. It is assumed that each producers' capacity is limited to 3/4th of his entire market and each is confronted with his own demand curve made up of one half of the consumers. The maximum output that A can produce is OB and B can produce OB'.

Fig. 30.4.

The demand curves of A and B respectively are DT and DH. A first enters the market and sets his price P_1 he sells the total output ap_1. Then B enters the market and sells at price slightly lower than A and thus captures his market. B then sells the whole output at p_2 and snatches from A bb' of sales. Now A reacts and captures B's market to the extent of CC'. This process of price-cutting, continues until one of them say B fixes his price at p_4. At this point none can snatch the market from the other by lowering the price. Then A raises the price back to p_1 to maximise his profit from his share of the market knowing that B has already thrown his entire supply. B then follows suit. There is thus continual oscillation of price between p_1 and p_4 i.e. the upper and lower limits.

Chamberlin Model

Unlike Cournot and Edgeworth models, Chamberlin model is based on the assumption that both the producers recognise their mutual interdependence. The following diagram (Fig. 30.5) explains this model:

Fig. 30.5

Suppose the producer A enters the market first DB is the demand curve and OL is the total output he chooses to produce. It is sold at OA price and the total profit made is OLPA. Now the producer B enters the market and produces LH quantity. Now the total quantity produced is OL + LH = OH.