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Unit 3: Business Economics

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SECTION – 1: Unit at a Glance

Sub Unit-1: Meaning and scope of business economics

Business Economics, also called Managerial Economics, is the application of economic theory and methodology to business. Business involves decision-making. Decision making means the process of selecting one out of two or more alternative courses of action. The question of choice arises because the basic resources such as capital, land, labour and management are limited and can be employed in alternative uses. The decision-making function thus becomes one of making choice and taking decisions that will provide the most efficient means of attaining a desired end, say, profit maximation.

- **Scope of Business Economics:**

As regards the scope of business economics, no uniformity of views exists among various authors. However, the following aspects are said to generally fall under business economics.

1. Demand Analysis and Forecasting
2. Cost and production Analysis.
3. Pricing Decisions, policies and practices.
4. Profit Management.
5. Capital Management.

Sub Unit-2: Objective of business firm

- **The main objectives of firms are:**
  - Profit maximization
  - Sales maximization
  - Increased market share/market dominance
  - Social/environmental concerns
  - Profit satisficing
  - Co-operatives

Sub Unit-3: Demand analysis: Law of demand, Elasticity of demand and its measurement, relationship between AR and MR

- **Law of demand:** The law of demand states that quantity purchased varies inversely with price. In other words, the higher the price, the lower the quantity demanded. This occurs because of diminishing marginal utility. That is, consumers use the first units of an economic good they purchase to serve their most urgent needs first, and use each additional unit of the good to serve successively lower valued ends.
- **Elasticity of demand and its measurement:** Elasticity is a measure of the degree of sensitivity (or responsiveness) of one variable to changes in another variable. Elasticity is defined as a ratio of the percentage change in the dependent variable to the percentage change in the independent variable.
- **Types of Elasticity of Demand:**
  1. Price Elasticity of Demand
  2. Income Elasticity of Demand
  3. Cross Elasticity of Demand

- **Measurement of Elasticity of Demand:**
  1. Perfectly Elastic Demand
  2. Relatively Elastic Demand
  3. Unity Elastic Demand
  4. Relatively Inelastic Demand
  5. Perfectly Inelastic Demand
- **Relationship between AR and MR:**
  - **General relationship between AR and MR:**

    The relationship between AR and MR depends on whether the price remains same or falls with rise in output. However, if nothing is mentioned about the nature of price with rise in output, then the following general relation exists between AR and MR:

    1. AR increases as long as MR is higher than AR (or when MR > AR, AR increases).
    2. AR is maximum and constant when MR is equal to AR (or when MR = AR, AR is maximum).
    3. AR falls when MR is less than AR (or when MR < AR, AR falls)

Sub Unit-4: Consumer behaviour: Utility Analysis; Indifference curve analysis

The theory of consumer's behaviour seeks to explain the determination of consumer's equilibrium. Consumer's equilibrium refers to a situation when a consumer gets maximum satisfaction out of his given resources. A consumer spends his money income on different goods and services in such a manner as to derive maximum satisfaction. Once a consumer attains equilibrium position, he would not like to deviate from it. Economic theory has approached the problem of determination of consumer's equilibrium in two different ways: (1) Cardinal Utility Analysis and (2) Ordinal Utility Analysis Accordingly.

- **Utility Analysis:** The term utility in Economics is used to denote that quality in a good or service by virtue of which our wants are satisfied. In, other words utility is defined as the want satisfying power of a commodity. According to, Mrs. Robinson, "Utility is the quality in commodities that makes individuals want to buy them."

  The Cardinal Approach to the theory of consumer behaviour is based upon the concept of utility. It assumes that utility is capable of measurement. It can be added, subtracted, multiplied, and so on.

  According to this approach, utility can be measured in cardinal numbers, like 1,2,3,4 etc. Fisher has used the term 'Util' as a measure of utility.

  Thus, in terms of cardinal approach it can be said that one gets from a cup of tea 5 utils, from a cup of coffee 10 utils, and from a rasgulla 15 utils worth of utility.
- **Indifference curve analysis:** Indifference Curve approach was first propounded by British economist Edgeworth in 1881 in his book "Mathematical Physics." The concept was further developed in 1906 by Italian economist Pareto, in 1913 by British economist W .E. Johnson, and in 1915 by Russian economist Stutsky. The credit of rendering this analysis as an important tool of theory of Demand goes to Hicks and Allen. In 1934, they presented it in a scientific form in their article titled "A Reconsideration of the Theory of Value." It was discussed in detail by Hicks in his book, "Value and Capital".

An indifference curve is a geometrical presentation of a consumer is scale of preferences. It represents all those combinations of two goods which will provide equal satisfaction to a consumer. A consumer is indifferent towards the different combinations located on such a curve. Since each combination located on such a curve. Since each combination yields the same level of satisfaction, the total satisfaction derived from any of these combinations remains constant.

Sub Unit-5: Law of variable proportions: Law of Return to Scale

"The term returns to scale refers to the changes in output as all factors change by the same proportion." Koutsoyiannis

"Returns to scale relates to the behaviour of total output as all inputs are varied and is a long run concept". Leibhafsky

- **Returns to scale are of the following three types:**

1. Increasing Returns to scale.
2. Constant Returns to Scale
3. Diminishing Returns to Scale

In the long run, output can be increased by increasing all factors in the same proportion. Generally, laws of returns to scale refer to an increase in output due to increase in all factors in the same proportion. Such an increase is called returns to scale.

1. Increasing Returns to Scale:

Increasing returns to scale or diminishing cost refers to a situation when all factors of production are increased, output increases at a higher rate. It means if all inputs are doubled, output will also increase at the faster rate than double. Hence, it is said to be increasing returns to scale.

2. Diminishing Returns to Scale:

Diminishing returns or increasing costs refer to that production situation, where if all the factors of production are increased in a given proportion, output increases in a smaller proportion. It means, if inputs are doubled, output will be less than doubled. If 20 percent increase in labour and capital is followed by 10 percent increase in output, then it is an instance of diminishing returns to scale.

3. Constant Returns to Scale:

Constant returns to scale or constant cost refers to the production situation in which output increases exactly in the same proportion in which factors of production are increased. In simple terms, if factors of production are doubled output will also be doubled.

Sub Unit-6: Theory of cost: Short-run and long-run cost curves

In traditional theory, costs are generalized in two parts on the basis of time period i.e. costs in short run and costs in long run period.

- **Costs are mainly of the following types:**

1. Total cost
2. Average cost
3. Marginal cost.

➢ **Long Run**

The long run is a planning and implementation stage. Here a firm may decide that it needs to produce on a larger scale by building a new plant or adding a production line. The firm may decide that new technology should be incorporated into its production process. The firm thus considers all its long-run production options and selects the optimal combination of inputs and technology for its long-run purposes. The optimal combination of inputs is the least-cost combination of inputs for desired level of output when all inputs are variable. Once the decisions are made and implemented and production begins, the firm is operating in the short run with fixed and variable inputs. Another part of the development of planning what a firm may decide if it needs to produce more on a larger scale or not is Keynes theory that the level of employment(labour), oscillates over an average or intermediate period, the equilibrium. This level of fixed capital is determined by the effective demand of a good. Changes in the economy, based on capital, variable and fixed cost can be studied by comparing the long run equilibrium to before and after changes in the economy.

➢ **Short Run**

All production in real time occurs in the short run. In the short run, a profit-maximizing firm will:

- increase production if marginal cost is less than marginal revenue (added revenue per additional unit of output);
- decrease production if marginal cost is greater than marginal revenue;
- continue producing if average variable cost is less than price per unit, even if average total cost is greater than price;
- shut down if average variable cost is greater than price at each level of outputs

Sub Unit-7: Price determination under different market forms: perfect competition; monopolistic competition; oligopoly-price leadership model; price discrimination

➢ **perfect competition:**

A perfectly competitive market is a hypothetical market where competition is at its greatest possible level. **Neo-classical** economists argued that perfect competition would produce the best possible outcomes for consumers, and society.

➢ **Key characteristics**

Perfectly competitive markets exhibit the following characteristics:

1. There is perfect knowledge, with no information failure or time lags in the flow of information. Knowledge is freely available to all participants, which means that risk-taking is minimal and the role of the entrepreneur is limited.
2. Given that producers and consumers have perfect knowledge, it is assumed that they make rational decisions to maximize their self-interest – consumers look to maximize their utility, and producers look to maximize their profits.
3. There are no barriers to entry into or exit out of the market.
4. Firms produce homogeneous, identical, units of output that are not branded.

5. Each unit of input, such as units of labour, are also homogeneous.
6. No single firm can influence the market price, or market conditions. The single firm is said to be a *price taker*, taking its price from the whole industry. The single firm will not increase its price independently given that it will not sell any goods at all. Neither will the rational producer lower price below the market price given that it can sell all it produces at the market price.
7. There are very many firms in the market – too many to measure. This is a result of having no barriers to entry.
8. There is no need for government regulation, except to make markets more competitive.
9. There are assumed to be no externalities, that is no external costs or benefits to third parties not involved in the transaction.
10. Firms can only make *normal* profits in the long run, although they can make abnormal (super-normal) profits in the short run.

➢ **Monopolistic Competition:**

Monopolistic competition is a market structure which combines elements of monopoly and competitive markets. Essentially a monopolistic competitive market is one with freedom of entry and exit, but firms can differentiate their products. Therefore, they have an inelastic demand curve and so they can set prices. However, because there is freedom of entry, supernormal profits will encourage more firms to enter the market leading to normal profits in the long term.

A monopolistic competitive industry has the following features:

- Many firms.
- Freedom of entry and exit.
- Firms produce differentiated products.
- Firms have price inelastic demand; they are price makers because the good is highly differentiated
- Firms make normal profits in the long run but could make supernormal profits in the short term
- Firms are allocatively and productively inefficient.

➢ **Oligopoly-price leadership model:**

There are various forms of price leadership.

The most common types of leadership are:

(a) Price leadership by a low-cost firm.

(b) Price leadership by a large (dominant) firm.

(c) Barometric price leadership.

These are the form of price leadership examined by the traditional theory of leadership as developed by Fellner and others. The characteristic of the traditional price leader is that he sets his price on marginalist rules, that is, at the level defined by the intersection of his MC and MR curves. For the leader the behavioral rule is MC = MR. The other firms are price-takers who will not normally maximize their profit by adopting the price of the leader. If they do, it will be by accident rather than by their own independent decision.

➢ **Price Discrimination:**

Price discrimination is the practice of charging a different price for the same good or service. There are three types of price discrimination – first-degree, second-degree, and third-degree price discrimination.

- **First degree**

First-degree price discrimination, alternatively known as *perfect price* discrimination, occurs when a firm charges a different price for every unit consumed.
The firm is able to charge the maximum possible price for each unit which enables the firm to *capture* all available consumer surplus for itself. In practice, first-degree discrimination is rare.

- **Second degree**

Second-degree price discrimination means charging a different price for different quantities, such as quantity discounts for bulk purchases.

- **Third degree**

Third-degree price discrimination means charging a different price to different consumer groups. For example, rail and tube travelers can be subdivided into commuter and casual travelers, and cinema goers can be subdivided into adults and children. Splitting the market into peak and off-peak use is very common and occurs with gas, electricity, and telephone supply, as well as gym membership and parking charges. Third-degree discrimination is the commonest type.

➢ *Necessary conditions for successful discrimination*

Price discrimination can only occur if certain conditions are met.

1. The firm must be able to identify different market segments, such as domestic users and industrial users.
2. Different segments must have different price elasticity's (PEDs).
3. Markets must be kept separate, either by time, physical distance and nature of use, such as Microsoft Office 'Schools' edition which is only available to educational institutions, at a lower price. Time based pricing – also called dynamic pricing – is increasingly common in goods and services sold online. In this case, prices can vary by the second, based on real-time demand related to consumers' online activity.
4. There must be no seepage between the two markets, which means that a consumer cannot purchase at the low price in the elastic sub-market, and then re-sell to other consumers in the inelastic sub-market, at a higher price.
5. The firm must have some degree of monopoly power.

Sub Unit-8: Pricing strategies: price skimming; price penetration; peak load pricing

➢ **price skimming**

Price skimming involves setting a high price before other competitors come into the market. This is often used for the launch of a new product which faces little or now competition – usually due to some technological features. Such products are often bought by "early adopters" who are prepared to pay a higher price to have the latest or best product in the market.
There are some other problems and challenges with this approach:

Price skimming as a strategy cannot last for long, as competitors soon launch rival products that put pressure on the price.
Distribution (place) can also be a challenge for an innovative new product. It may be necessary to give retailers higher margins to convince them to stock the product, reducing the improved margins that can be delivered by price skimming.
A final problem is that by price skimming, a firm may slow down the volume growth of demand for the product. This can give competitors more time to develop alternative products ready for the time when market demand (measured in volume) is strongest.

- **price penetration:**

Penetration pricing is a pricing strategy that is used to quickly gain market share by setting an initially low price to entice customers to purchase from the company. Such pricing strategy is generally used by new entrants into a market. An extreme form of penetration pricing is called predatory pricing.

- **Rationale Behind Penetration Pricing**

It is common for a new entrant to use a penetration pricing strategy to compete effectively in the marketplace. Price is one of the easiest ways to differentiate new entrants among existing market players. The overarching goal of the pricing strategy is to:

- Capture market share
- Create brand loyalty
- Switch customers from competitors
- Generate significant demand and utilize economies of scale
- Drive competitors out of the market

- Situations where penetration pricing works effectively:
  - When there is little product differentiation
  - Demand is price-elastic
  - Where the product is suitable for a mass market (utilizing economies of scale)

- **peak load pricing:**

Peak-load pricing is another pricing variation where the operator and government interests coincide. Peak-load pricing is useful when marginal costs vary depending on when the service is used. For example, the telecommunications operator builds his network with the capacity to serve the peak demand, which generally occurs during business hours. As a result, network costs are caused by peak demand and not demand during off-peak hours. To facilitate marginal cost pricing, the operator would maximize profit by charging higher prices during peak hours and lower prices during off-peak hours. The prices at the peak reflect the marginal costs of capacity and the lower-off peak prices reflect only the marginal costs of off-peak usage, which are generally close to zero in telecommunications.

Peak-load pricing requires sophisticated measurement of customer usage. This is rarely a problem in telecommunications, but requires advanced metering technologies in energy and water. As a result, the cost of implementing these advanced measurement technologies must be weighed against the welfare gains of metering. This is a situation where the operator and government may disagree. The operator benefits from advanced metering only to the extent that the metering increases profits. The government is also interested in how the metering benefits customers, so the government may have a stronger desire for advanced metering than does the operator.

SECTION – 2: KEY STATEMENTS

Every candidate appearing for NET/SET examination should follow these key (main) points those can help them a better understanding regarding this unit very quickly.

Basic Key Statements: Demand analysis and forecasting (3.2.1), Pricing decisions, policies and practices (3.2.3), Effective utilization of business resources (3.2.6), Effective use of economic policies for business development (3.2.7), The main objectives of firms (3.2.1), Law of demand (3.3.1), Types of demand (3.3.1.1), Elasticity of demand and its measurement (3.3.2), General relationship between AR and MR (3.3.3.1), AR, MR and Elasticity (3.3.3.7), Applicability of the Law of Variable Proportions (3.5.3), Concept of different cost (3.6.1), Perfect competition (3.7.1),

Standard Key Statements: Cost and production analysis (3.2.2), Profit analysis (3.2.4), Alternative aims of firms (3.2.3), Factors Affecting Demand (3.3.1.2), Elasticity of demand with graphical way (3.3.2.2), Relationship between AR and MR (Price remains Constant**)** (3.3.3.2), Relationship between AR and MR (When Price falls with rise in output) (3.3.3.3), AR and MR Curves under Monopoly and Monopolistic (3.3.3.5), Utility analysis (3.4.1), Law of return to scale (3.5.1), Three Stages of the Law (3.5.2), Short run and long run cost curves (3.6.2), Monopoly- Price discrimination (3.7.4),

Advanced Key Statements: Capital management (3.2.5), Profit maximization (3.2.2), Measurement of Elasticity of Demand (3.3.2.3), Under Pure Competition (3.3.3.4), Under Oligopoly (3.3.3.6), Indifference curve analysis (3.4.2), Postponement of the Law (3.5.4), Monopolistic competition (3.7.2), Oligopoly-price leadership model (3.7.3), Price skimming (3.8.1), Price penetration (3.8.2), peak load pricing (3.8.3).

Sub-unit1: Meaning and scope of business economics

3.1 Meaning

In simple words, business economics is the discipline which helps a business manager in decision making for achieving the desired results. In other words, it deals with the application of economic theory to business management.

According to Spencer and Siegelman, Business economics is "the integration of economic theory with business practice for the purpose of facilitating decision making and forward planning by management". According to Mc Nair and Meriam, "Business economics deals with the use of economic modes of thought to analyze business situation". From the above said definitions, we can say that business economics makes in depth study of the following: i) Understanding the business in a better way ii) Identification of the business areas where economic analysis can be applied iii) Planning for the future based on the past events iv) Decision making

3.2 Scope (Nature) Of Business Economics:

Business economics is a developing science. Its scope is gradually increasing in the modernized world. It covers the following areas

3.2.1 Demand analysis and forecasting: The foremost aspect regarding scope is demand analysis and forecasting. A business firm is an economic unit which transforms productive resources into saleable goods. Since all output is meant to be sold, accurate estimates of demand help a firm in minimizing its costs of production and storage. A firm must decide its total output before preparing its production schedule and deciding on the resources (land, labour, capital and technology) to be employed. Demand forecasts serves as a guide to the management for maintaining its market share in competition with its rivals, thereby securing its profit.

3.2.2 Cost and production analysis: A firm's profitability depends much on its costs of production. A wise manager would prepare cost estimates for a range of output and identify the factors that cause deviations in cost (increase or decrease). Once the factors are known, it can be possible to determine the optimum level of output where the cost of production would be minimum. Production processes are under the charge of engineers but the business manager works to carry out the production function analysis in order to avoid wastage of materials and time. Sound pricing policies (determining selling price) depend much on cost control. The main topics discussed under cost and production analysis are: Cost concepts, cost-output relationships, Economies and Diseconomies of scale and cost control.

3.2.3 Pricing decisions, policies and practices: Another task before a business economist is the pricing of a product. Since a firm's income and profit depend mainly on the price of the product, the pricing policies and all such decisions are to be taken after careful analysis of the nature of the market in which the firm operates. The important topics covered in this field of study are: Market Structure Analysis, Pricing Practices and Price Forecasting.

3.2.4 Profit analysis: Each and every business tends to earn profit. It is the profit that increases the competitive strength of a firm in the long run. Economists tell us that profits are the reward for taking risk in uncertain situations. A successful business economist is one who can form more or less correct estimates of costs and revenues at different levels of output. The more successful an economist is in reducing uncertainty, the higher are the profits earned by the business. Therefore, profit-planning and profit measurement constitute the most challenging area of business economics.

3.2.5 Capital management: Another challenging problem for a modern business economist is planning the capital investment. Investments are made in the plant and machinery and buildings which are very high. Therefore, capital management requires top level decisions. It deals with Cost of capital, Rate of Return and Selection of projects etc.

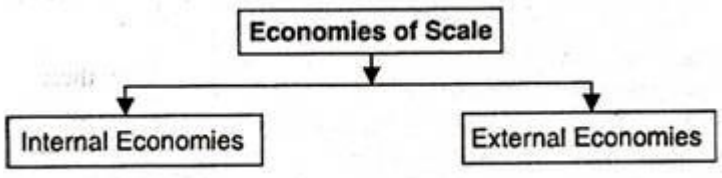
3.2.6 Effective utilization of business resources: It also studies how well resources can be put to best possible use. Various tools and techniques are used to determine least cost-maximum profit combinations. Methods such as linear programming, networking analysis are used in determining the optimal levels of performance.

3.2.7 Effective use of economic policies for business development: Business economics is micro in character but it is always influenced by macro factors. For example, an individual firm's idea (micro economic) of manufacturing plastic bags may be affected by the ban on plastic by the government (macroeconomic). Thus economic policies (macro) have to be carefully studied in order to make proper business decisions. Sometimes economic policies of government also create favorable environment for business units. For instance, Make In India initiative has motivated banks to give more loans to fund seeking companies.

3.2.8 Others: a. Supply analysis b. Competitor analysis c. Distribution and transportation management d. Inventory management e. Linear programming f. Environmental issues g. Business cycles.

3.3 Economies of Scale:

As the scale of production is increased, up to a certain point, one gets economies of scale. Beyond that, there are its diseconomies to scale Marshall has classified economies to scale into two parts as under:



I. Internal Economies:

As a firm increases its scale of production, the firm enjoys several economies named as internal economies. Basically, internal economies are those which are special to each firm. For example, one firm will enjoy the advantage of good management; the other may have the advantage of specialization in the techniques of production and so on.

"Internal economies are those which are open to a single factory, or a single firm independently of the action of other firms. These result from an increase in the scale of output of a firm and cannot be achieved unless output increases." Cairncross

Prof. Koutsoyannis has divided the internal economies into two parts:

A. Real Economies

B. Pecuniary Economies

A. Real Economies:

Real economies are those which are associated with the reduction of physical quantity of inputs, raw materials, various types of labour and capital etc.

These economies are of the following types:

I. Technical Economies:

Technical economies have their influence on the size of the firm. Generally, these economies accrue to large firms which enjoy higher efficiency from capital goods or machinery. Bigger firms having more resources at their disposal are able to install the most suitable machinery. Therefore, a firm producing on large scale can enjoy economies by the use of superior techniques.

Technical economies are of three kinds:

(i) Economies of Dimension:

A firm by increasing the scale of production can enjoy the technical economies. When a firm increases its scale of production, average cost of production falls but its average return will be more.

(ii) Economies of Linked Process:

A big firm can also enjoy the economies of linked process. A big firm carries all productive activities. These activities get economies. These linked activities save time and transport costs to the firm.

(iii) Economies of the Use of By-Products:

All the large sized firms are in a position to use its by-products and waste-material to produce another material and thus, supplement to their income. For instance, sugar industries make power, alcohol out of the molasses.

2. Marketing Economies:

When the scale of production of a firm is increased, it enjoys numerous selling or marketing economies. In the marketing economies, we include advertisement economies, opening up of show rooms, appointment of sole distributors etc. Moreover, a large firm can conduct its own research to effect improvement in the quality of the product and to reduce the cost of production. The other economies of scale are advertising economies, economies from special arrangements with exclusive dealers. In this way, all these acts lead to economies of large-scale production.

3. Labour Economies:

As the scale of production is expanded them accrue many labour economies, like new inventions, specialization, time saving production etc. A large firm employs large number of workers. Each worker is given the kind of job he is fit for. The personnel. officer evaluates the working efficiency of the labour if possible. Workers are skilled in their operations which save production, time and simultaneously encourage new ideas.

4. Managerial Economies:

Managerial economies refer to production in managerial costs and proper management of large-scale firm. Under this, work is divided and subdivided into different departments. Each department is headed by an expert who keeps a vigil on the minute details of his department. A small firm cannot afford this specialization. Experts are able to reduce the costs of production under their supervision. These also arise due to specialization of management and mechanization of managerial functions.

5. Economies of Transport and Storage:

A firm producing on large scale enjoys the economies of transport and storage. A big firm can have its own means of transportation to carry finished as well as raw material from one place to another. Moreover, big firms also enjoy the economies of storage facilities. The big firm also has its own storage and go down facilities. Therefore, these firms can store their products when prices are unfavorable in the market.

B. Pecuniary Economies:

Pecuniary economies are those which can be had after paying less prices for the factors used in the process of production and distribution. Big firms can get raw material at the low price because they buy the same in the large bulk. In the same way, they enjoy a lot of concessions in bank borrowing and advertisements.

These economies occur to a large firm in the following:

(i) The firms producing output on a large-scale purchase raw material in bulk quantity. As a result of this, the firms get a special discount from suppliers. This is a monetary gain to the firms.

These economies occur to a large firm in the following:

(i) The firms producing output on a large-scale purchase raw material in bulk quantity. As a result of this, the firms get a special discount from suppliers. This is a monetary gain to the firms.

(ii) The large-scale firms are offered loans by the banks at a low interest rate and other favorable terms.

(iii) The large-scale firms are offered concessional transportation facilities by the transport companies because of the large-scale transportation handling.

(iv)The large-scale firms advertise their products on large scales and they are offered advertising facilities at lower prices by advertising firms and newspapers.

II. External Economies:

External economies refer to all those benefits which accrue to all the firms operating in a given industry. Generally, these economies accrue due to the expansion of industry and other facilities expanded by the Government. According to Cairncross, “External economies are those benefits which are shared in by a number of firms or industries when the scale of production in any industry increases.” Moreover, the simplest case of an external economy arises when the scale of production function of a firm contains as an implicit variable the output of the industry. A good example is that of coal mines in a locality.

Prof. Cairncross has divided the external economies into the following parts as:

1. Economies of Concentration:

As the number of firms in an area increases each firm enjoys some benefits like, transport and communication, availability of raw materials, research and invention etc. Further, financial assistance from banks and non-bank institutions easily accrue to firm. Concentrations in industries lead to economies of concentration.

2. Economies of Information:

When the number of firms in an industry expands, they become mutually dependent on each other. In other words, they do not feel the need of independent research on individual basis. Many scientific and trade journals are published. These journals provide information to all the firms which relates to new markets, sources of raw materials, latest techniques of production etc.

3. Economies of Disintegration:

As an industry develops, all the firms engaged in it decide to divide and sub-divide the process of production among themselves. Each firm specializes in its own process. For instance, in case of moped industry, some firms specialize in rims, hubs and still others in chains, pedals, tires etc. It is of two types-horizontal disintegration and vertical disintegration.

In case of horizontal disintegration each firm in the industry tries to specialize in one particular item whereas, under vertical disintegration every firm endeavors to specialize in different types of items. Material of one firm may be available and useable as raw materials in the other firms. Thus, wastes are converted into by-products.

The selling firms reduce their costs of production by realizing something for their wastes. The buying firms gain by getting other firms' wastes as raw materials at cheaper rates. As a result of this, the average cost of production declines.

➢ **Significance of Economies of Scale:**

The significance of economies of scale is discussed as under:

(a) Nature of the Industry:

The foremost significance of economies of scale is that it plays an important role in determining the nature of the industry i.e. increasing cost industry, constant cost industry or decreasing cost industry.

(b) Analysis of Cost of Production:

When an industry expands in response to an increase in demand for its products, it experiences some external economies as well as some external diseconomies. The external economies tend to reduce the costs of production and thereby causing an upward shift in the long period average cost curve, whereas the external diseconomies tend to raise the costs and thereby causing an upward shift in the long period average cost curve. If external diseconomies outweigh the external economies, that is, when there are net external diseconomies, the industry would be an Increasing cost industry.

- **What are Economies of Scope?**

Economies of scope describe situations in which the long-run average and marginal cost of a company, organization, or economy decreases, due to the production of some complementary goods and services. An economy of scope means that the production of one good reduces the cost of producing another related good.

While economies of scope are characterized by efficiencies formed by variety, economies of scale are characterized by volume. The latter involves the reduction of the average cost, or the cost per unit, that stems from increasing production for one single type of product. Economies of scale helped drive corporate growth in the 20th century, for example through assembly line production.

Sub Unit-2: Objective of business firm

3.2.1 The main objectives of firms are:

- Profit maximization
- Sales maximization
- Increased market share/market dominance
- Social/environmental concerns
- Profit satisficing
- Co-operatives

Sometimes there is an overlap of objectives. For example, seeking to increase market share, may lead to lower profits in the short-term, but enable profit maximization in the long run.

3.2.2 Profit maximization: An assumption in classical economics is that firms seek to maximize profits.

- Profit = Total Revenue (TR) – Total Costs (TC).
- Therefore, profit maximization occurs at the biggest gap between total revenue and total costs.
- A firm can maximize profits if it produces at an output where marginal revenue (MR) = marginal cost (MC)

Usually, in economics, we assume firms are concerned with maximizing profit. Higher profit means:

- Higher dividends for shareholders.
- More profit can be used to finance research and development.
- Higher profit makes the firm less vulnerable to takeover.
- Higher profit enables higher salaries for workers

3.2.3 Alternative aims of firms: However, in the real world, firms may pursue other objectives apart from profit maximization.

1. Profit Satisfying

- In many firms, there is a separation of ownership and control. Those who own the company (shareholders) often do not get involved in the day to day running of the company.
- This is a problem because although the owners may want to maximize profits, the managers have much less incentive to maximize profits because they do not get the same rewards, (share dividends)
- Therefore, managers may create a minimum level of profit to keep the shareholders happy, but then maximize other objectives, such as enjoying work, getting on with other workers. (e.g. not sacking them) This is the problem of separation between owners and managers.
- This 'principal-agent' problem can be overcome, to some extent, by giving managers share options and performance related pay although in some industries it is difficult to measure performance.

2. Sales maximization

Firms often seek to increase their market share – even if it means less profit. This could occur for various reasons:

- Increased market share increases monopoly power and may enable the firm to put up prices and make more profit in the long run.
- Managers prefer to work for bigger companies as it leads to greater prestige and higher salaries.
- Increasing market share may force rivals out of business. E.g. the growth of supermarkets has led to the demise of many local shops. Some firms may actually engage in predatory pricing which involves making a loss to force a rival out of business.

3. Growth maximization

This is similar to sales maximization and may involve mergers and takeovers. With this objective, the firm may be willing to make lower levels of profit in order to increase in size and gain more market share. More market share increases its monopoly power and ability to be a price setter.

4. Long run profit maximization

In some cases, firms may sacrifice profits in the short term to increase profits in the long run. For example, by investing heavily in new capacity, firms may make a loss in the short run but enable higher profits in the future.

5. Social/environmental concerns

A firm may incur extra expense to choose products which don't harm the environment or products not tested on animals. Alternatively, firms may be concerned about local community / charitable concerns.

- Some firms may adopt social/environmental concerns as part of their branding. This can ultimately help profitability as the brand becomes more attractive to consumers.
- Some firms may adopt social/environmental concerns on principal alone – even if it does little to improve sales/brand image.

6. Co-operatives

Co-operatives may have completely different objectives to a typical PLC. A co-operative is run to maximize the welfare of all stakeholders – especially workers. Any profit the co-operative makes will be shared amongst all members.

- **Pure profit:** pure profit is the accounting profit minus the implicit or opportunity costs. One thing that needs to keep in mind is that pure profit is theoretical or hypothetical. Most business owners and firms don't consider opportunity cost as a real expense because there is no accurate way to calculate it.

Diagram showing different objectives of firms

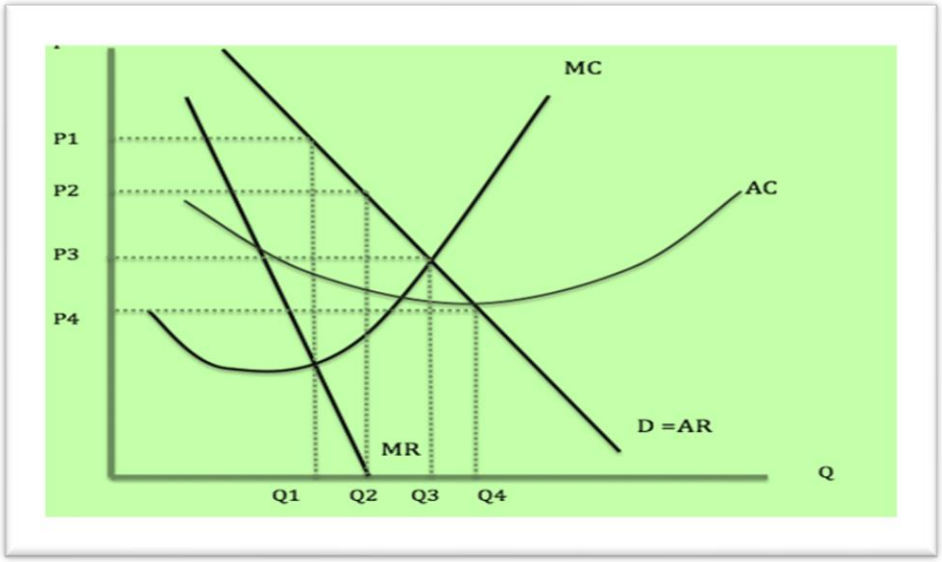


Figure-1

- Q1 = Profit maximisation (MR=MC)
- Q2 = Revenue Maximisation (MR=0)
- Q3 = Marginal cost pricing (P=MC) – allocative efficiency
- Q4 = Sales maximisation – maximum sales while still making normal profit (AR=ATC)

Sub Unit-3: Demand analysis

3.3.1 Law of demand:

In economics, the relationship between price and quantity is called as "Law of Demand." If price of any goods or services increases then the demand for that will decrease and vice versa. When the quantity demanded of a good rise due to the fall in price, it is called extension of demand and when the quantity demanded falls due to the rise in price it is called contraction of demand. Though, 'Giffen goods' are an exception where Law of Demand doesn't work. A Giffen good is one which people consume more of as price rises (positive price elasticity). In such situation, cheaper close substitutes are not available. Because of the lack of substitutes, the income effect dominates, leading people to buy more of the good, even as its price rises. Some types of premium goods, for example. Expensive French wines, BMW cars are sometimes claimed to be Giffen goods. It is said that, decrease in the price of such high-status goods can reduce its demand, as they are no longer perceived to be exclusive or of high status.

Both the demand and supply curve show the relationship between price and the number of units demanded or supplied. The price elasticity of demand is the percentage change in the quantity demanded of a goods or service divided by the percentage change in the price. The price elasticity of supply is the percentage change in quantity supplied divided by the percentage change in price.

3.3.1.1. Types of demand:

Types of demand	**Description**
Elastic Demand	Here the price elasticity of demand is more than 1
Inelastic Demand	Here the change in demand is less in comparison to change in price that means price elasticity of demand is less than 1
Unit Elastic Demand	Here change in demand and price, both are equal
Perfectly Elastic Demand	Here the value for price elasticity of demand is infinity
Perfectly Inelastic Demand	Here demand doesn't change with change in time

3.3.1.2 Factors Affecting Demand:

Factors	Description with Examples
Price of substitute product	Consumers switch towards the substitute product when there is a price reduction in the regular product they use. For example, previously there was a difference in price and usage of mobile phone and land line. The main objective behind phone is communication but mobile phone is also useful for other multipurpose activities. So, the demand for land line phone came down in comparison to mobile phone.
Income of consumer	This is one of the most important aspects which affect the demand for goods in market. Increase in income of a consumer lead to increase in demand for normal goods.
Preference of Consumer	It refers to the subjective choice of a consumer. The demand of a product may be affected by knowledge, friends, education and culture.

Weather fluctuation	The demand for different product varies as per the seasons. For example, demand of AC is more during the time of summer but in off seasons the price is less as compared to summer.

3.3.2. Elasticity of demand and its measurement:

3.3.2.1. Meaning:

Elasticity is a measure of the degree of sensitivity (or responsiveness) of one variable to change in another variable. In other words, elasticity as a ratio of the percentage changes in the dependent variable to the percentage changes in the independent variable.

- **Types of elasticity:** Mainly there are three types of elasticity, each measuring the relationship between two significant economic variables. They are:

1. **Price elasticity of demand (PED):** Which measures the responsiveness of quantity demanded to a change in price. PED can be measured over a price range, called arc elasticity, or at one point, called point elasticity.
2. **Cross elasticity of demand (XED):** Which measures responsiveness of the quantity demanded of one good, good X, to a change in the price of another good, good Y. For complementary goods a negative cross elasticity of demand is observed. On the other hand for substitute goods we observed positive cross elasticity of demand.
3. **Income elasticity of demand (YED):** Which measures the responsiveness of quantity demanded to a change in consumer incomes.

3.3.2.2. Elasticity of demand with graphical way:

(i) Perfectly inelastic Demand:

When the demand does not change at all; or the change in demand is zero.

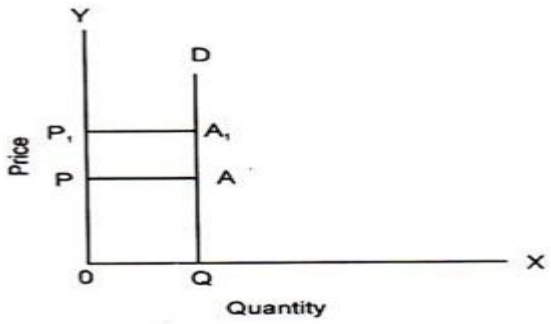


Figure-2

(ii) Less than unit Elastic or Inelastic Demand:

When the percentage change in quantity demanded is less than the percentage change in price.

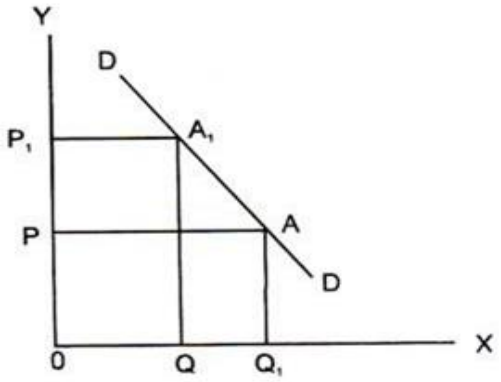


Figure-3

(iii) Equal to Unit Elastic Demand:

When, the percentage change in demand equals the percentage change in price.

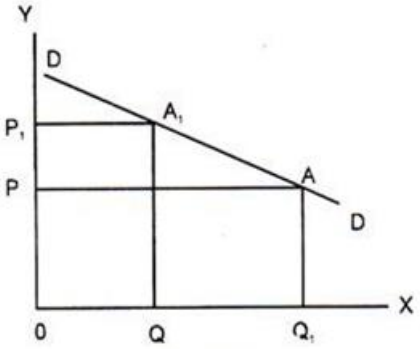


Figure-4

(iv) More than Unit Elastic:

When, the percentage change in demand is more than the percentage change in price.

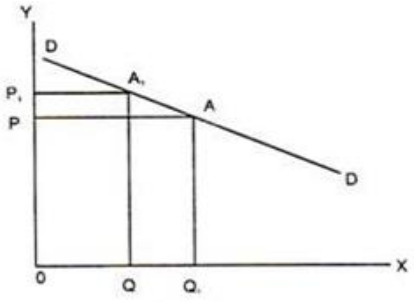


Figure-5

(v) Perfectly Elastic:

When, the change in demand is infinite.

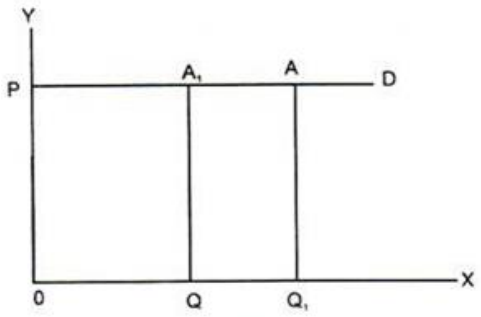


Figure-6

3.3.2.3. Measurement of Elasticity of Demand:

There are two commonly used methods of the measurement of the elasticity of demand.

These are as follows:

(1) Total Outlay Method, and

(2) Point Method.

1. Total Outlay Method:

By total outlay we mean the total expenditure incurred by the consumers on a commodity. Total outlay can be found by multiplying the number of units consumed with their prices. When the prices change total outlay may also change.

It is with the help of this total outlay that we can measure the price elasticity of demand, and get the following three results:

(1) Less than Unit Elastic:

When the total outlay falls with a fall in price, and rises with an increase in price.

(2) Equal to Unit Elastic:

When, the total outlay remains constant at different prices.

(3) More than Unit Elastic:

When the total outlay falls with a rise in price, and rises with a fall in price.

The different results can be tabulated as follows:

Type of Elasticity	Effect of fall in price on total outlay	Effect of rise in price on total outlay
Less than unit elastic or inelastic	Smaller outlay	More Outlay
Unit elastic	Constant outlay	Constant outlay
More than unit elastic	More outlay	Less outlay

We can measure elasticity graphically with the help of the total outlay curves as in Fig.-7 Bellow. Demand is unit elastic over the price range P to P_1 because total outlay remains constant. Demand is inelastic over the price range O to P_1. With fall in price, total outlay falls

and vice versa. Demand is elastic over the price range P to P_1; total outlay increases with fall in price and vice versa.

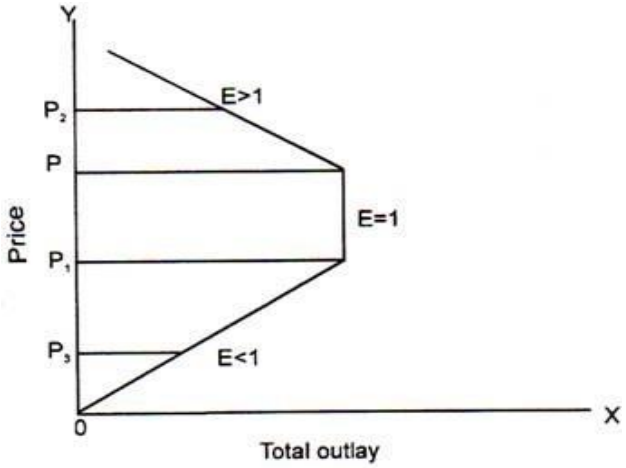


Figure-7

Elasticity of demand to a commodity depends upon a number of factors, among which the most important are availability of substitutes, nature of commodity—necessity, comfort or luxury; price of commodity, alternative uses of the commodity, etc.

Firstly, the availability of substitute goods affects the elasticity of demand. A commodity will have elastic demand if there are good substitutes for it.

Secondly, a necessity that has no substitutes will have an inelastic demand.

Thirdly, a commodity, the amount spent on which constitutes a small fraction of the total expenditure is apt to be inelastic.

Fourthly, inexpensive goods are apt to be inelastic in demand.

Fifthly, an object that has several kinds of uses is apt to be elastic in demand.

Lastly, consumer's behaviour, tastes and preferences influence the demand for a commodity.

Will the demand for the following products be elastic or inelastic?

Give explanation - Camera, Salt, Liril soap, Newspaper:

(1) Camera – Highly elastic, since it is luxury good.

(2) Salt – Highly inelastic, since it has no substitutes

(3) Liril soap: Highly elastic, since there is a large number of competitive brands available.

(4) Newspaper: Inelastic, since it has become a necessity for almost all households.

2. Point Elasticity on a Linear Demand Curve:

Point elasticity is the ratio of an infinitesimally small relative change in quantity to an infinitesimally small change in price. If a price range is made as small as possible, that is, shrunk to a point- then the relative changes must be made as small as possible- infinitesimally small.

Point elasticity is the ratio of an infinitesimally small relative change in quantity to an infinitesimally small change in price. Point elasticity of demand is defined as the -proportionate change in the quantity demanded resulting from a very small proportionate change in price.

Let us take a point such as R on the demand curve DD. For measuring elasticity at a point the following formula may be used.

$$e_P = \frac{\Delta Q}{Q} \cdot \frac{P}{\Delta P}$$

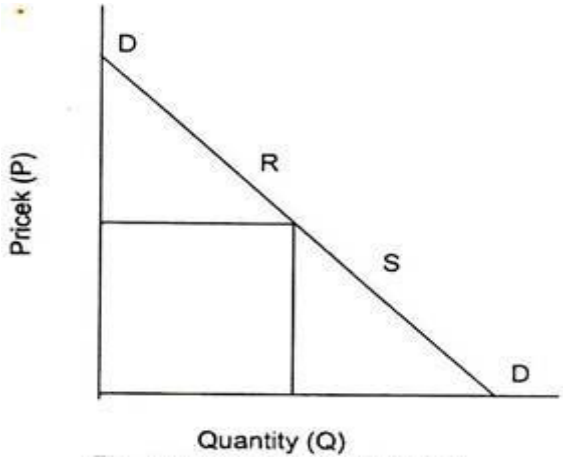


Figure-8

Point elasticity is the product of price-quantity ratio (P/Q) at a particular point (R) on the demand curve (DD) and the reciprocal of the slope of the demand line. The slope of the demand slope is defined by RQ/QD. The reciprocal of the slope of the demand line is QD/RQ.

$$e_p = \frac{\partial Q}{\partial P} = \frac{QD}{RQ}$$

At point R, price P = RQ and Q = OQ

If we substitute these values in equation 1.8, what we get is

$$e_p = \frac{RQ}{OQ} \cdot \frac{QD}{RQ} = \frac{QD}{OQ}$$

If the numerical values for QD and OQ are available, elasticity at point R can be calculated.

- **Price Elasticity at Different Points on a Non-Linear Demand Curve:**

The method used to measure point elasticity on a linear demand curve cannot be applied straightway to measure point elasticity on a non-linear demand curve. In order to measure point elasticity on a non-linear demand curve, we first draw a tangent to the selected point and bring it on a linear demand curve. Fig.-9 below illustrates how we can measure point elasticity on a non-linear demand curve at point R.

For this purpose, we draw a tangent AB through point R. Since demand curve DD and the line AB pass through the same point R, the slope of the demand curve and that of the tangent is the same. Therefore, the elasticity of demand curve at point R will be the same as the elasticity on point R on line AB. The formula applied to measure the elasticity on a linear demand curve can now be used as the non-linear demand curve has been changed into a linear demand curve.

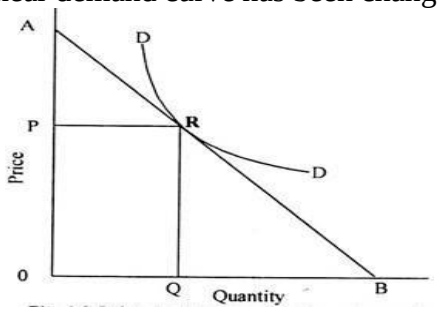


Figure-9

- **Income Elasticity of Demand:**

By income of demand we mean the responsiveness of demand for a commodity to a change in the income of the consumers.

Income elasticity of demand is expressed as follows:

E_P = Percentage change in quantity demanded /P Percentage change in price

We can talk of three types of income elasticity of demand as follows:

(1) Zero income Elasticity:

When the change in income does not lead to change in the demand for the commodity, e.g., demand for food-grains, salt, etc.

(2) Negative income Elasticity:

When an increase in income is accompanied by a fall in the quantity demanded, e.g., demand for inferior goods.

(3) Positive Income Elasticity:

When the amount demanded of a commodity increases with an increase in the level of income and vice versa.

- **Cross Elasticity of Demand:**

Demand is also influenced by prices of other goods and services. The cross elasticity measures the responsiveness of quantity demanded to changes in price of other goods and services. Cross elasticity of demand is defined as the percentage change in quantity demanded of one good caused by a 1 percentage change in the price of some other good.

$$e_c = \frac{\%\Delta Q_x}{\%\Delta P_y}.$$

Cross elasticity is used to classify the relationship between goods. If cross elasticity is greater than zero, an increase in the price of y causes an increase in the quantity demanded of x, and the two products are said to be substitutes. When the cross- elasticity is greater than zero, the goods or services involved are classified as complements Increases in the price of y reduces the quantity demanded of that product. Diminished demand for y causes a reduced demand for x. Bread and butter, cars and tires, and computers and computer programs are examples of pairs of goods that are complements.

The coefficient is positive if A and B are substitutes because the price change and the quantity change are in the same direction. The coefficient is negative if A and B are complements, because changes in the price of one commodity cause opposite changes in the quantity demanded of the other. Other things such as consumer taste for both commodities, consumer incomes and the price of the other commodity are held constant.

Many companies produce several related products. Where a company's products are related, the pricing of one good can influence the demand for other products. Gillette makes both razors and razor blades. Ford sells several competing makes of automobiles. Gillette probably will sell more razor blades if it lowers the price of its razors.

The closer two commodities are as substitutes for each other, the greater is the size of the cross-elasticity coefficient. Close substitutes have high cross elasticity of demand; poor substitutes have low cross elasticity.

In general, a rise in the price of a commodity increases the demand for its substitutes and diminishes the demand for its complements.

3.3.3 Relationship between AR and MR:

3.3.3.1 General relationship between AR and MR:

The relationship between AR and MR depends on whether the price remains same or falls with rise in output. However, if nothing is mentioned about the nature of price with rise in output, then the following general relation exists between AR and MR:

1. AR increases as long as MR is higher than AR (or when MR > AR, AR increases).
2. AR is maximum and constant when MR is equal to AR (or when MR = AR, AR is maximum).
3. AR falls when MR is less than AR (or when MR < AR, AR falls)

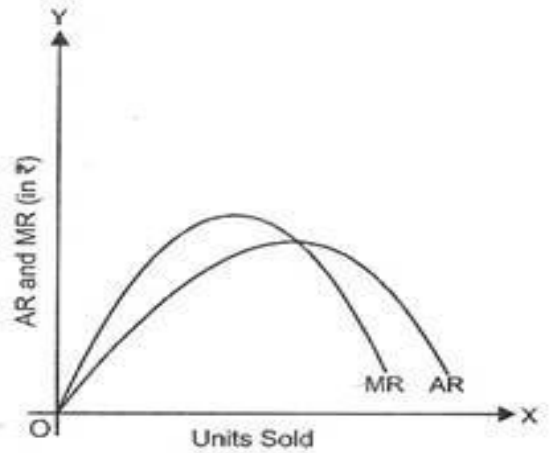


Figure-10

4. It must be noted that specific relationship between AR and MR depends upon the relation of price with output, i.e., whether price remains same or varies inversely with output.

3.3.3.2 Relationship between AR and MR (When Price remains Constant):

When price remains same at all output levels (like in case of perfect competition), no firm is in a position to influence the market price of the product. A firm can sell more quantity of output at the same price. It means, the revenue from every additional unit (MR) is equal to AR. As a result, both AR and MR curves coincide in a horizontal straight line parallel to the X-axis as shown in

Table 1: AR and MR (When Price remains Constant)

Units sold	**Price/AR** (Rs.)	**TR** (Rs.)	**MR**(Rs.)
1	5	5	5
2	5	10	5
3	5	15	5
4	5	20	5
5	5	25	5

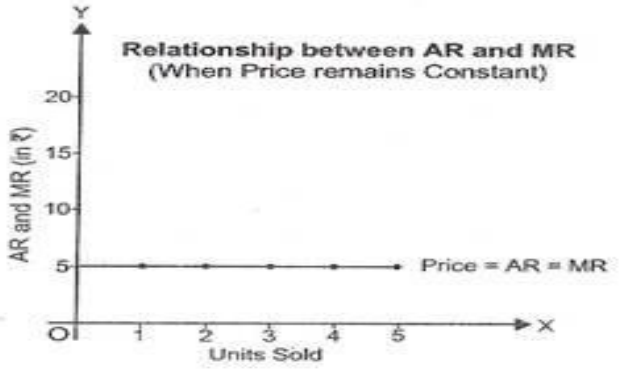


Figure-11

As seen in the given schedule and diagram, price (AR) remains same at all level of output and is equal to MR. As a result, demand curve (or AR curve) is perfectly elastic.

Always remember that when a firm is able to sell more output at the same price, then AR = MR at all levels of output.

3.3.3.3 Relationship between AR and MR (When Price falls with rise in output):

When firms can increase their volume of sales only by decreasing the price, then AR falls with increase in sale. It means, revenue from every additional unit (i.e. MR) will be less than AR. As a result, both AR and MR curves slope downwards from left to right.

Table 3: AR and MR (When Price Falls with rise in output)

Units Sold	AR (Rs.)	TR (Rs.)	MR (Rs.)	Ratio of Fall (AR: MR)
1	5	5	5	—
2	4	8	3	1 :2
3	3	9	1	1 :2
4	2	8	-1	1 :2
5	1	5	-3	1 :2

Both MR and AR fall with increase in output. However, fall in MR is double than that in AR, i.e., MR falls at a rate which is twice the rate of fall in AR. As a result, MR curve is steeper than the AR curve because MR is limited to one unit, whereas, AR is derived by all the units. It leads to comparatively lesser fall in AR than fall in MR.

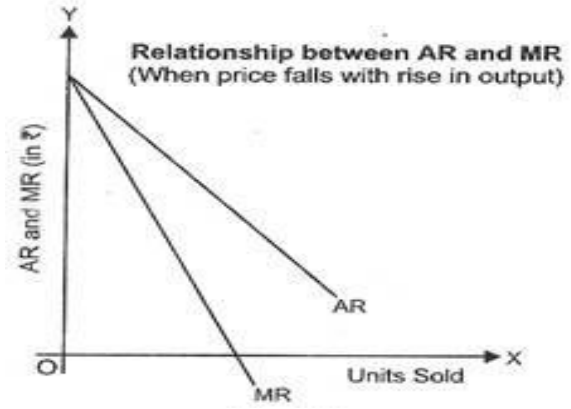


Figure-12

It must be noted that MR can fall to zero and can even become negative. However, AR can be neither zero nor negative as TR it is always positive.

3.3.3.4 Under Pure Competition:

The average revenue curve is a horizontal straight line parallel to the X-axis and the marginal revenue curve coincides with it. This is because under pure (or perfect) competition the number of firms selling an identical product is very large.

The price is determined by the market forces of supply and demand so that only one price tends to prevail for the whole industry, as shown in Table 1. It is OP, as shown in Panel (A) of Figure 1. Each firm can sell as much as it wishes at the market price OP.

Thus, the demand for the firm's product becomes infinitely elastic. Since the demand curve is the firm's average revenue curve, the shape of the AR curve is horizontal to the X-axis at price OP, as shown in Panel (B) and the MR curve coincides with it. This is also shown in Table 1 where AR and MR remain constant at Rs.20 at every level of output. Any change in the demand and supply conditions will change the market price of the product, and consequently the horizontal AR curve of the firm.

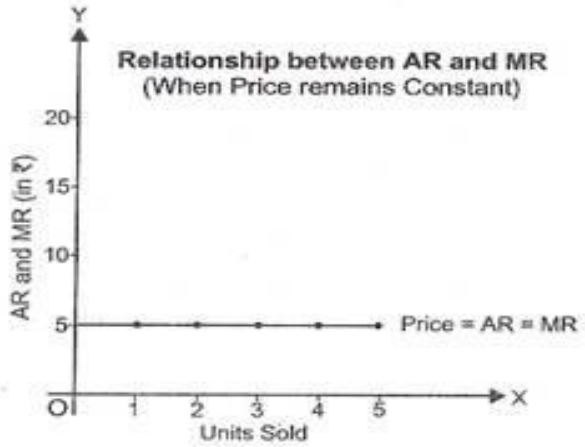
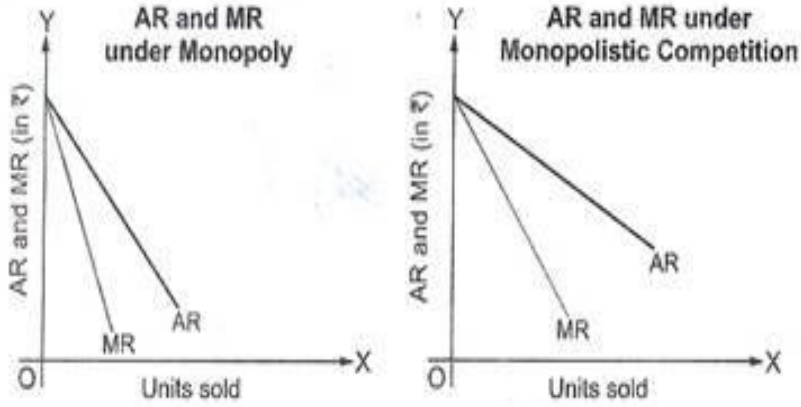


Figure-13

3.3.3.5 AR and MR Curves under Monopoly and Monopolistic Competition:

1. Both, Monopoly and Monopolistic Competition fall under the category of Imperfect Competition. Therefore, AR and MR curves slope downwards as more units can be sold only by reducing the price. However, there is one major difference between AR and MR curves of monopoly and monopolistic competition.
2. Under monopolistic competition, the AR and MR curves are more elastic as compared to those of Monopoly. It happens because of the presence of close substitutes under monopolistic competition and absence of close substitutes under monopoly. So, when price of a commodity is increased in both the markets, then proportionate fall in demand under monopoly is less than proportionate fall in demand under monopolistic competition.

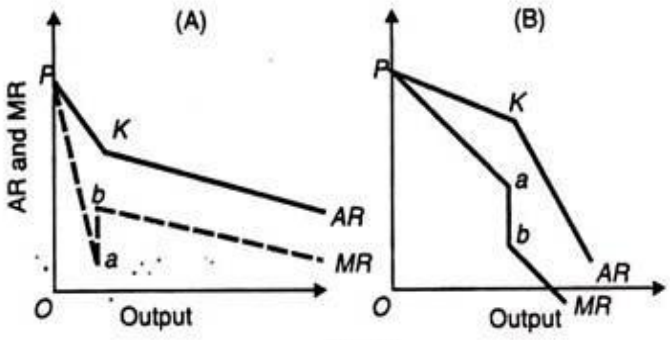


Figures-14 & 15

3.3.3.6 Under Oligopoly:

The average and marginal revenue curves do not have a smooth downward slope under oligopoly. They possess kinks. Since the number of sellers under oligopoly is small, the effect of a price cut or price increase on the part of one seller will be followed by some changes in the behaviour of other firms. If a seller raises the price of his product, the other sellers will not follow him in order to earn larger profits at the old price.

So, the price-raising seller will experience a fall in the demand for his product. His average revenue curve in Figure16 (A) becomes elastic after K and its corresponding MR curve rises discontinuously from a to b and then continues its course at the new higher level.



Figures-16(A) & 17(B)

On the other hand, if the oligopolistic seller reduces the price of his product, his rivals also follow him in reducing the prices of their products so that he is not able to increase his sales. His AR curve becomes less elastic from K onward, as in Figure17 (B). The corresponding MR curve falls vertically from a to b and then slopes at a lower level.

3.3.3.7 AR, MR and Elasticity:

However, the true relationship between the AR curve and its corresponding MR curve under monopoly or imperfect competition depends upon the elasticity of the AR curve. We know that elasticity at point C in Figure 18 is

E= CM/ PA =CM/CD (PA= CD being the sides of similar Δs)

$$E = \frac{CM}{CM - DM} = \frac{AR}{AR - MR} \text{ (where } CM \text{ is } AR \text{ and } DM \text{ is } MR\text{)}$$

$$\therefore E = \frac{A}{A - M}$$

(where E is elasticity, A average revenue and M marginal revenue.)

By solving, we have,

$$EA - EM = A$$

$$EA - A = EM$$

$$A(E - 1) = EM$$

$$A = \frac{EM}{E - 1}$$

$$\therefore A = M\frac{E}{E - 1}$$

Similarly, marginal revenue (M) can also be known,

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

By solving,

$$E(A - M) = A$$

$$EA - EM = A$$

$$EA - A = EM$$

or $$EM = EA - A$$

$$\therefore M = \frac{EA - 1}{E}$$

$$M = \frac{A(E - 1)}{E}$$

$$\therefore M = A\frac{E - 1}{E}$$

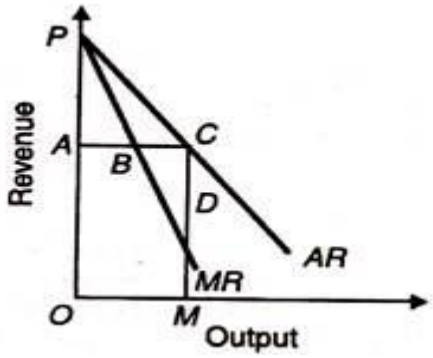


Figure-18

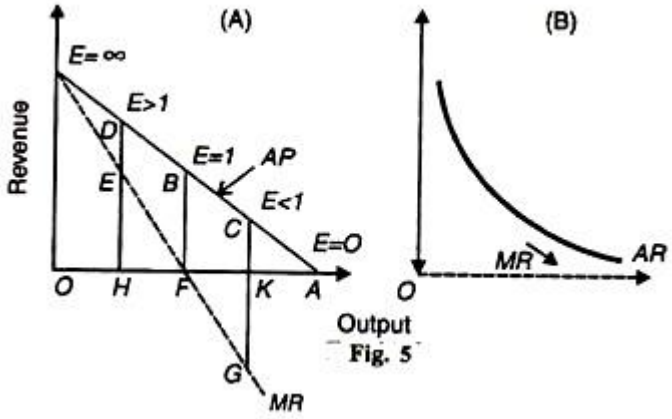
On the basis of this formula, the relationship between AR and MR is explained in terms of the Figure 19 (A). At point B on the average revenue curve, PA, the elasticity of demand is equal to 1. According to the formula,

MR = AR 1-1/1 = AR 0/1 = 0

The MR curve is zero when it touches the X-axis at point F. Thus, where elasticity of AR curve is unity, MR is always zero

In case the elasticity of the AR curve is unity throughout its length like a rectangular hyperbola, the MR curve will coincide with the X-axis, shown as a dotted line in Figure 19 (B).

If the elasticity of the AR curve at point D is greater than unity, say 3, MR = AR -3-1/3= 2/3. It shows that when the elasticity of AR is greater than one, MR is always positive. It is EH in Figure 19 (A).



Figures-19(A) & 19 (B)

Where the elasticity of the AR curve is less than unity, say 1/2,

MR= AR= ½ $^{-1}$/ ½ = -½/ ½ = -1. It shows MR to be negative. At point C on the AR curve, elasticity is less than unity and MR is negative KG. If the elasticity of AR is infinity (E = ∞), MR coincides with it at point P. Lastly, when the elasticity of the AR curve is zero, the gap between AR and MR curves becomes wider and MR lies much below the X-axis.

Sub Unit-4: Consumer behaviour

3.4.1Utility analysis

Equilibrium refers to a position of 'rest' or 'no change'. When a consumer spends his income in the best possible way and when he gets maximum utility, he is in equilibrium. At position of equilibrium, a consumer will not like to change its expenditure on different goods.

Consumer's equilibrium in terms of utility analysis can be explained in three different cases: In the first case, let us assume a consumer has to consume a commodity for which he has not to pay any price. The marginal utility curve of the commodity slopes downwards to indicate that a consumer will extend the consumption of this commodity to the point where marginal utility becomes zero, as is clear from fig. 20

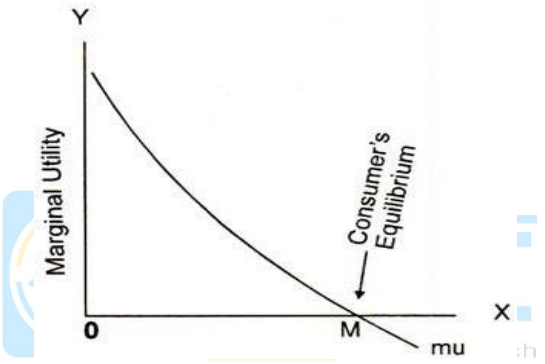


Figure-20

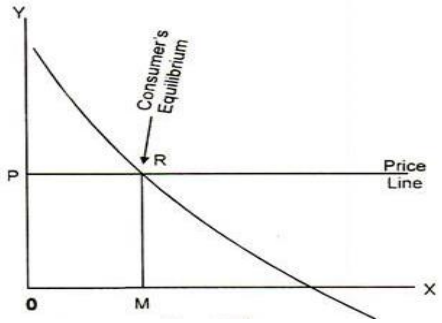


Figure-21

In Fig.20 the consumer will extend his consumption to the point where marginal utility curve cuts the quantity axis, i.e., he will consume OM quantity of the commodity.

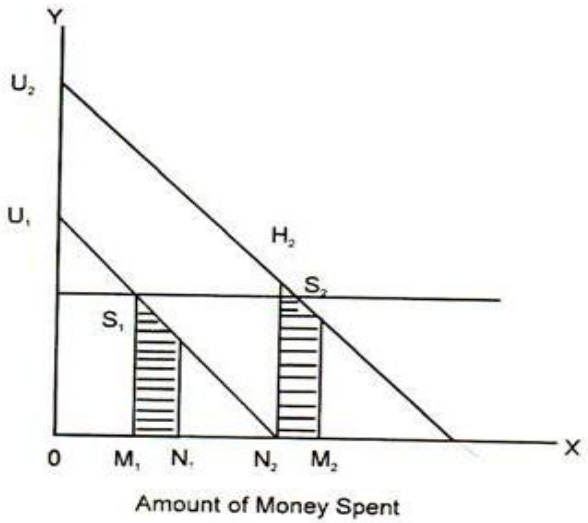


Figure-22 (a)

In the second case, we assume that a consumer has to pay the price for all the units consumed by him. In this situation, the consumer will restrict his consumption at the point where,
MU = Price of the commodity, as can be seen from fig. 21
In the third case, we can explain the consumer's equilibrium when he has to choose between two commodities for which he has to pay. In this case, a consumer will get maximum satisfaction when marginal utilities for a rupee worth of both the commodities will be equal.
This situation is shown in fig. 22 (a). U_1 and U_2 are two marginal utility curves for oranges and apply respectively. The consumer spends OM_1 money on oranges and M_1 M_2 money on apples. By this allocation of money between the two commodities, the consumer equalizes the marginal utility of money for both the commodities.
Any other distribution of money, between the two commodities, will get him less total utility. Suppose the consumer spends an extra unit of money (say M_1N_1) on oranges and spends a unit less (= M2) apples. He will gain utility = $S_1M_1N_1H_1$ and lose utility = $H_2N_2M_2S_2$– It is obvious that this allocation will result in a loss of total utility for him.
From this description we can make a general conclusion about consumer's equilibrium when a consumer has to purchase two or more commodities. We can say, a consumer will be in equilibrium when the marginal utilities of the money worth of the various commodities are equal. In short, consumer will be in equilibrium when,
$MU_z/ P_{z=} MU_y/P_y= MU_z/ P_z =$ ……..etc.

3.4.1.1 Consumer Behavior Analysis: Cardinal Utility Approach (Alfred Marshall)

The analysis of consumer behavior seeks to answer two questions.
Firstly, how does a consumer decide the optimum quantity of a good that he/she selects to consume?
Secondly, how the disposable income is allocated by the consumer for different goods, so that he/she maximizes the utility?

- **The cardinal utility approach answers these two questions on the basis of the following assumptions:**

i. Rationality:
Assumes that a consumer is rational and satisfies his/her wants in order of his/her preferences. Therefore, he/she firstly prefers to purchase those goods which yield highest utility and lastly those that provide lowest utility.
ii. Limited Money Income:
Refers to one of the important assumptions of the cardinal utility approach. According to this approach, a consumer has a limited amount of income to be expended on goods selected by him/her for consumption. Therefore, in such a case when there is an objective of utility maximization along with limited income, he/she selects those goods whose consumption is unavoidable.
iii. Maximization of Satisfaction:
Implies that every rational consumer strives to maximize his/her satisfaction from the limited income.

iv. Utility is Measurable:

Assume that utility is cardinally measurable. Therefore, utility of one unit of good equals to the units of money that a consumer is willing to pay, which means that 1 util = 1 unit of money.

v. Diminishing Marginal Utility:

Constitutes the basis for consumer behaviour analysis. The utility gained falls as more and more units of a good are consumed.

vi. Constant Marginal Utility of Money:

Implies that whatever the level of income, the MU of money remains the same. According to this assumption, money is used as a measure of utility. This theory does not believe that utility of money does not change for a consumer. It is based on a less valid assumption of given marginal utility of money.

vii. Utility is Additive:

Implies that utility is not only cardinally measurable, but can be added together to obtain the total utility. For instance, a consumer consumes X_1, X_2, and X_3 units of good X and derives U_1, U_2 and U_3 utils, respectively.

In such a case, the total utility derived by a consumer from n units of good X is expressed as:

$U_n = U_1 (X_1) + U_2 (X_2) + U_3 (X_3) +\ldots\ldots\ldots\ldots + U_n (X_n)$

- **Consumer's Equilibrium through Utility:**

A consumer is one who buys goods and services for his/her personal satisfaction. In theoretical terms, consumer's equilibrium is achieved at a point when he/she reaches to the maximum level of his/her satisfaction, given resources and other conditions. On the other hand, in technical terms, a consumer reaches his maximum satisfaction level when the last unit of money spent on each goods yield the same utility.

Let us take an example of one good to explain how a consumer reaches equilibrium.

Suppose a consumer consumes only one good X with a given income. He has two options either to spend income to purchase good X or retain it in the form of an asset. If the MU of good X (MUx) is greater than MU of money (MUm), the consumer would purchase the good.

Therefore, the consumer would spend his income on good X as long as utility of a good is greater than the price of a good, which implies MUx > Px (MUm). Here, the assumption is that MU of a good diminishes as more and more unit of the good is consumed and MU of money remains constant that is MUm=1.

Thus, consumer reaches equilibrium when:

MUx = Px(MUm)

Or

Mux/Px (MUm) = 1

The consumer's equilibrium is shown graphically

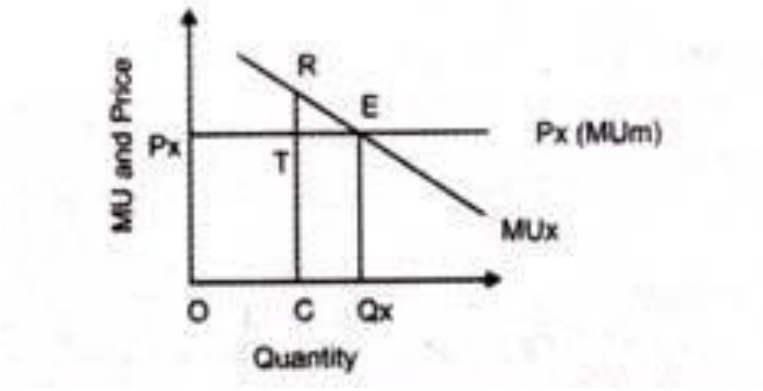


Figure- 22 (b) Consumer's equilibrium

As shown in Figure-22(b), the horizontal line Px shows the constant utility of money and MUx curve represents the diminishing marginal utility of a good. The intersection of MUx and Px curve takes place at E that is when quantity consumed is OQx, then MUx=Px(MUm).
Thus, consumer achieves equilibrium at E. Above point E, MUx > Px(MUm) implying that a consumer increase the consumption of good as utility achieved is more. At point R, consumer gains MU as RC where cost incurred is TC. Thus, marginal gain is RT and this situation exists till a consumer reaches point E.
If we look at the point below point E, where MUx < Px (MUm), a consumer would consume more than OQx and loses utility. Thus, satisfaction is increased by reducing the consumption. Therefore, point E is the equilibrium point.
In real life, a consumer consumes a large amount of goods, thus question arises how a consumer achieves equilibrium in case of a number of goods. A rational consumer consumes goods according to the preference. He/she would first purchase the good that yields the highest utility followed by the good yielding second highest utility. The expenditure is switched from one good to another till a stage is reached when MU of each good is same per unit of expenditure. This is called law of equi-marginal utility.
Let us discuss consumer equilibrium in case of two goods X and Y whose prices are Px and Py, respectively.

Consumer's equilibrium is given as:

MUx=Px (MUm)
And MUy=Py(MUm)

The consumer's equilibrium is expressed as:

$MU_x/P_x(MU_x) = 1 = MU_y/P_y(MU_y)$

It can be further rewritten as:

$MU_x/P_x = MU_y/P_y$

The aforementioned equation implies that a consumer reaches the equilibrium when MU derived from each rupees spent on two goods is same.
or
$MU_x/MU_y = P_x/P_y$
The aforementioned equation implies that a consumer is in equilibrium when MU ratio of any two goods equals the price ratio.

Let us now take the numerical example to learn consumer's equilibrium with the help of Table-4:

Consumption (Units)	Total Utility (Rs)	Marginal Utility (Rs)	Total Expenditure (Market price= Rs. 3)	Gain to Consumer
0	0	0	-	-
1	4	4	3	1
2	7	3	6	1
3	9	2	9	0
4	10	1	12	-2
5	10	0	15	-5

From Table-4, it can be seen when a consumer buys one unit of a good at the market price of Rs. 3, he/she gains utility worth Rs. 4 In such a case, the consumer gains Re. 1. When he/she buys two units, the utility gained is Rs. 7 and total price paid is Rs 6. Again, he/she gains Re 1. Next, when he/she purchases three units, the utility gained is Rs. 9 and price paid is Rs. 9. In such a case' he/she does not gain anything. If he buys further, the total gain would become negative. From Table-4, it can be seen that MU is equal to price two units of consumption. Consumer equilibrium is achieved when the consumer buys two units because at this point quantity and utility gained is maximum and MU (Rs. 3) is equal to price (Rs. 3).

- **Derivation of Individual Demand:**

The derivation of demand curve was done on the basis of the law of demand. It should be noted that the demand curve and law of demand are based on the utility maximizing behavior of consumers. The analysis of consumer equilibrium helps in deriving an individual demand curve for a good. As discussed earlier, consumer equilibrium takes place when MUx= Px (MUm).

Derivation of demand curve from MUx:

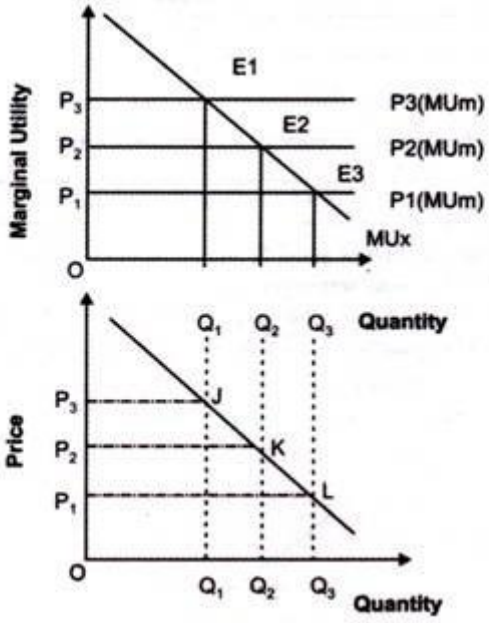


Figure- 22 (c, d): Deriving demand curve through consumer Equilibrium Approach

Figure-22 (c) shows the derivation of demand curve for good X. The price quantity combination corresponding to equilibrium points E1 E2 and E3 are shown at point J, K, and L, respectively which gives a demand curve for good X. Suppose E1 is the point of equilibrium

at price P3 and quantity OQ1. If price falls to P2, the equilibrium would be disturbed and shift to E2 with quantity OQ2.
Similarly, when the price becomes P1, equilibrium shifts to E3 with quantity OQ3. Thus, when price increases, quantity demanded decreases. This inverse relationship between price and quantity gives the demand curve. Explaining with the help of utility, if P3 falls to P2, MUx > P3 (MUm) at OQ1. Thus, for maintaining equilibrium, the quantity demanded by a consumer should increase to OQ2, which would reduce MUx. Thus, equilibrium is achieved at MUx =P2 (MUm).

- **Ordinal Utility (**J.R. Hicks)

In ordinal utility, the consumer only ranks choices in terms of preference but we do not give exact numerical figures for utility.
For example, we prefer a BMW car to a Nissan car, but we don't say by how much.
It is argued this is more relevant in the real world. When deciding where to go for lunch, we may just decide I prefer an Italian restaurant to Chinese. We don't calculate the exact levels of utility.
Carl Menger, an Austrian economist, developed concepts of utility which rested on ranked preferences.
In 1906 Vilfredo Pareto in 1906 concentrated on an indifference curve map. This placed preferences on bundles of goods but did not attempt to say how much.

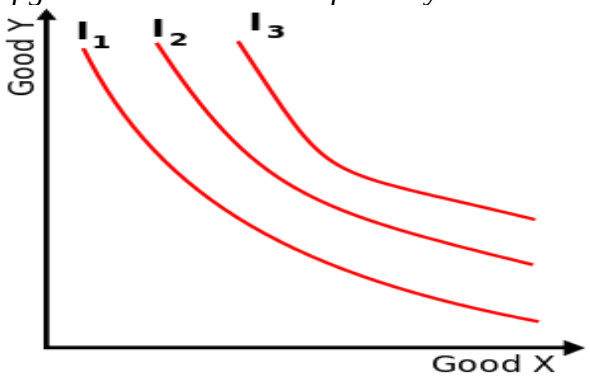


Figure-22(e)

Ordinal analysis of consumers' behaviour is more preferable than cardinal utility analysis because of the bifurcation of price effects into income and substitution effects.
Income effects: The income effect is the manner in which a consumer spends money or demands services and goods based on an increase or decrease in his income.
Substitution effect: The substitution effect is the change in consumption patterns due to a change in the relative prices of goods.

3.4.2 Indifference curve analysis

It is a curve that represents all the combinations of goods that give the same satisfaction to the consumer. Since all the combinations give the same amount of satisfaction, the consumer prefers them equally. Hence the name Indifference Curve.
Here is an example to understand the indifference curve better. Peter has 1 unit of food and 12 units of clothing. Now, we ask Peter how many units of clothing is he willing to give up in exchange for an additional unit of food so that his level of satisfaction remains unchanged.

Peter agrees to give up 6 units of clothing for an additional unit of food. Hence, we have two combinations of food and clothing giving equal satisfaction to Peter as follows:

1. 1 unit of food and 12 units of clothing
2. 2 units of food and 6 units of clothing

By asking him similar questions, we get various combinations as follows:

Combination	Food	Clothing
A	1	12
B	2	6
C	3	4
D	4	3

Graphical Representation:

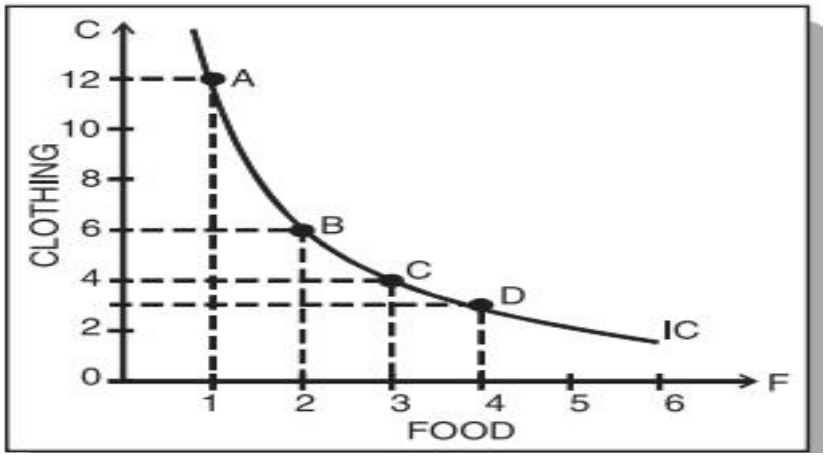


Figure-23

The diagram shows an Indifference curve (IC). Any combination lying on this curve gives the same level of consumer satisfaction. It is also known as Iso-Utility Curve.

Indifference Map

An Indifference Map is a set of Indifference Curves. It depicts the complete picture of a consumer's preferences. The following diagram showing an indifference map consisting of three curves:

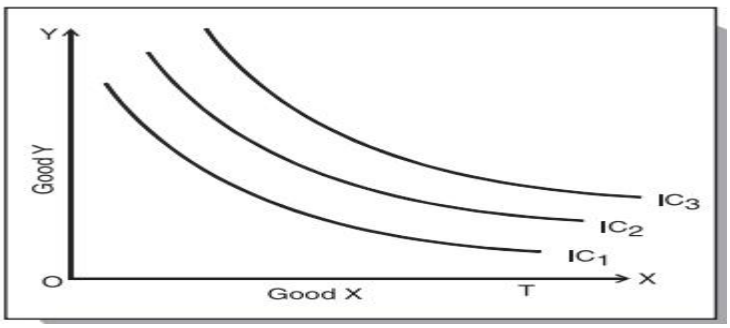


Figure-24

We know that a consumer is indifferent among the combinations lying on the same indifference curve. However, it is important to note that he prefers the combinations on the higher indifference curves to those on the lower ones.

This is because a higher indifference curve implies a higher level of satisfaction. Therefore, all combinations on IC1 offer the same satisfaction, but all combinations on IC2 give greater satisfaction than those on IC1.

Marginal Rate of Substitution

This is the rate at which a consumer is prepared to exchange a good X for Y. If we go back to Peter's example above, we have the following table: 5

Combination	Food	Clothing	MRS
A	1	12	–
B	2	6	6
C	3	4	2
D	4	3	1

In this example, Peter initially gives up 6 units of clothing to get an extra unit of food. Hence, the MRS is 6. Similarly, for subsequent exchanges, the MRS is 2 and 1 respectively. Therefore, MRS of X for Y is the amount of Y whose loss can be compensated by a unit gain of X, keeping the satisfaction the same.

Interestingly, as Peter accumulates more units of food, the MRS starts falling – meaning he is prepared to give up fewer units of clothing for food. There are two reasons for this:

1. As Peter gets more units of food, his intensity of desire for additional units of food decreases.
2. Most of the goods are imperfect substitutes for one another. If they could substitute one another perfectly, then MRS would remain constant.

Properties of an Indifference Curve or IC

Here are the properties of an indifference curve:

1. An IC slopes downwards to the right

   This slope signifies that when the quantity of one commodity in combination is increased, the amount of the other commodity reduces. This is essential for the level of satisfaction to remain the same on an indifference curve.

2. An IC is always convex to the origin

   From our discussion above, we understand that as Peter substitutes clothing for food, he is willing to part with less and less of clothing. This is the diminishing marginal rate of substitution. The rate gives a convex shape to the indifference curve. However, there are two extreme scenarios:

   1. Two commodities are perfect substitutes for each other – In this case, the indifference curve is a straight line, where MRS is constant.
   2. Two goods are perfect complementary goods – An example of such goods would be gasoline and water in a car. In such cases, the IC will be L-shaped and convex to the origin.

   3. Indifference curves never intersect each other

   Two ICs will never intersect each other. Also, they need not be parallel to each other either. Look at the following diagram:

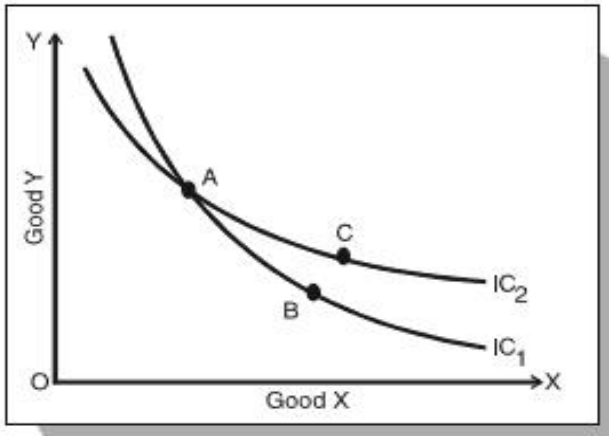


Figure-25

Fig 25 shows tow ICs intersecting each other at point A. Since A and B lie on IC1, the give the same satisfaction level. Similarly, A and C give the same satisfaction level, as they lie on IC2. Therefore, we can imply that B and C offer the same level of satisfaction, which is logically absurd. Hence, no tow ICs can touch or intersect each other.

4. A higher IC indicates a higher level of satisfaction as compared to a lower IC

   A higher IC means that a consumer prefers more goods than not.

5. An IC does not touch the axis

   This is not possible because of our assumption that a consumer considers different combinations of two commodities and wants both of them. If the curve touches either of the axes, then it means that he is satisfied with only one commodity and does not want the other, which is contrary to our assumption.

- **Budget Line**

  Since a higher indifference curve represents a higher level of satisfaction, a consumer will try to reach the highest possible IC to maximize his satisfaction. In order to do so, he has to buy more goods and has to work under the following two constraints:

  1. He has to pay the price for the goods and
  2. He income is limited, restricting the availability of money for purchasing these goods

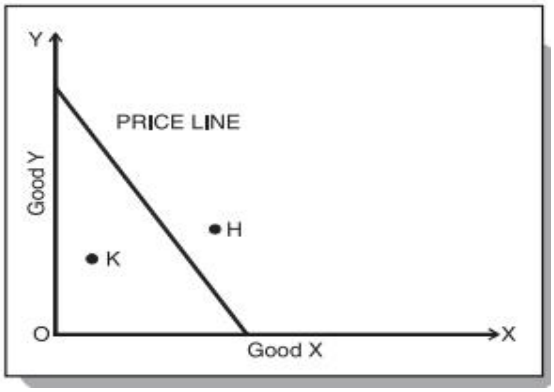


Figure-26

As can be seen above, a budget line shows all possible combinations of two goods that a consumer can buy within the funds available to him at the given prices of the goods. All combinations that are within his reach lie on the budget line.

A point outside the line (point H) represents a combination beyond the financial reach of the consumer. On the other hand, a point inside the line (point K) represents under-spending by the consumer.

Sub Unit-5: Law of variable proportion

3.5.1 Law of return to scale

"The law of variable proportion states that if the inputs of one resource is increased by equal increment per unit of time while the inputs of other resources are held constant, total output will increase, but beyond some point the resulting output increases will become smaller and smaller." Leftwitch

- **Assumptions:**

Law of variable proportions is based on following assumptions:

(i) Constant Technology:

The state of technology is assumed to be given and constant. If there is an improvement in technology the production function will move upward.

(ii) Factor Proportions are Variable:

The law assumes that factor proportions are variable. If factors of production are to be combined in a fixed proportion, the law has no validity.

(iii) Homogeneous Factor Units:

The units of variable factor are homogeneous. Each unit is identical in quality and amount with every other unit.

(iv) Short-Run:

The law operates in the short-run when it is not possible to vary all factor inputs.

- **Explanation of the Law:**

In order to understand the law of variable proportions we take the example of agriculture. Suppose land and labour are the only two factors of production.

By keeping land as a fixed factor, the production of variable factor i.e., labour can be shown with the help of the following table: 6

Units of Land	Units of Labour	Total Production	Average Production	Marginal Production	
10 Acres	0	–	–	–	
"	1	20	20	20	
"	2	50	25	30	1st stage
"	3	90	30	40	MP > AP
"	4	120	30	30	AP = MP
"	5	140	28	20	
"	6	150	25	10	2nd stage
"	7	150	21.3	0	MP=0 and TP Maximum
"	8	140	17.5	–10	3rd stage MP < 0

From the table 6 it is clear that there are three stages of the law of variable proportion. In the first stage average production increases as there are more and more doses of labour and capital employed with fixed factors (land). We see that total product, average product, and marginal product increases but average product and marginal product increases up to 40 units. Later on, both start decreasing because proportion of workers to land was sufficient and land is not properly used. This is the end of the first stage.

The second stage starts from where the first stage ends or where AP=MP. In this stage, average product and marginal product start falling. We should note that marginal product falls at a faster rate than the average product. Here, total product increases at a diminishing rate. It is also maximum at 70 units of labour where marginal product becomes zero while average product is never zero or negative.

The third stage begins where second stage ends. This starts from 8th unit. Here, marginal product is negative and total product falls but average product is still positive. At this stage, any additional dose leads to positive nuisance because additional dose leads to negative marginal product.

Graphic Presentation:

In fig. 27, on OX axis, we have measured number of labourers while quantity of product is shown on OY axis. TP is total product curve. Up to point 'E', total product is increasing at increasing rate. Between points E and G it is increasing at the decreasing rate. Here marginal product has started falling. At point 'G' i.e., when 7 units of labourers are employed, total product is maximum while, marginal product is zero. Thereafter, it begins to diminish corresponding to negative marginal product. In the lower part of the figure MP is marginal product curve.

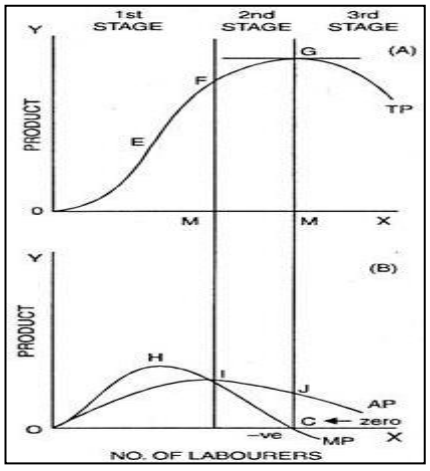


Figure-27

Up to point 'H' marginal product increases. At point 'H', i.e., when 3 units of labourers are employed, it is maximum. After that, marginal product begins to decrease. Before point 'I' marginal product becomes zero at point C and it turns negative. AP curve represents average product. Before point 'I', average product is less than marginal product. At point 'I' average product is maximum. Up to point T, average product increases but after that it starts to diminish.

3.5.2 Three Stages of the Law:

1. First Stage:

First stage starts from point 'O' and ends up to point F. At point F average product is maximum and is equal to marginal product. In this stage, total product increases initially at increasing rate up to point E. between 'E' and 'F' it increases at diminishing rate. Similarly, marginal product also increases initially and reaches its maximum at point 'H'. Later on, it begins to diminish and becomes equal to average product at point T. In this stage, marginal product exceeds average product (MP > AP).

2. Second Stage:

It begins from the point F. In this stage, total product increases at diminishing rate and is at its maximum at point 'G' correspondingly marginal product diminishes rapidly and becomes 'zero' at point 'C'. Average product is maximum at point 'I' and thereafter it begins to decrease. In this stage, marginal product is less than average product (MP < AP).

3. Third Stage:

This stage begins beyond point 'G'. Here total product starts diminishing. Average product also declines. Marginal product turns negative. Law of diminishing returns firmly manifests itself. In this stage, no firm will produce anything. This happens because marginal product of the labour becomes negative. The employer will suffer losses by employing more units of laborer's. However, of the three stages, a firm will like to produce up to any given point in the second stage only.

Total Product	Marginal Product	Average Product
Stage I		
First increases at increasing rate then at diminishing rate.	Increases in the beginning then reaches a maximum and begins to decrease.	First increases, continues to increase and becomes maximum.
Stage II		
Continues to increase at diminishing rate and becomes maximum.	Continues to diminish and becomes equal to zero.	Becomes equal to MP and then begins to diminish.
Stage III		
Diminishes	Becomes negative.	Continues to diminish but will always be greater than zero.

In Which Stage Rational Decision is Possible:

To make the things simple, let us suppose that, a is variable factor and b is the fixed factor. And a_1, a_2 , a_3….are units of a and b_1 b_2b_3…… are unit of b.

Stage I is characterized by increasing AP, so that the total product must also be increasing. This means that the efficiency of the variable factor of production is increasing i.e., output per unit of a is increasing. The efficiency of b, the fixed factor, is also increasing, since the total product with b_1 is increasing.

The stage II is characterized by decreasing AP and a decreasing MP, but with MP not negative. Thus, the efficiency of the variable factor is falling, while the efficiency of b, the fixed factor, is increasing, since the TP with b_1 continues to increase.

Finally, stage III is characterized by falling AP and MP, and further by negative MP. Thus, the efficiency of both the fixed and variable factor is decreasing.

- **Rational Decision:**

Stage II becomes the relevant and important stage of production. Production will not take place in either of the other two stages. It means production will not take place in stage III and stage I. Thus, a rational producer will operate in stage II.

Suppose b were a free resource; i.e., it commanded no price. An entrepreneur would want to achieve the greatest efficiency possible from the factor for which he is paying, i.e., from factor a. Thus, he would want to produce where AP is maximum or at the boundary between stage I and II.

If on the other hand, a were the free resource, then he would want to employ b to its most efficient point; this is the boundary between stage II and III.

Obviously, if both resources commanded a price, he would produce somewhere in stage II. At what place in this stage production takes place would depend upon the relative prices of a and b.

- **Condition or Causes of Applicability:**

There are many causes which are responsible for the application of the law of variable proportions.

They are as follows:

1. Under Utilization of Fixed Factor:

In initial stage of production, fixed factors of production like land or machine, is under-utilized. More units of variable factor, like labour, are needed for its proper utilization. As a result of employment of additional units of variable factors there is proper utilization of fixed factor. In short, increasing returns to a factor begins to manifest itself in the first stage.

2. Fixed Factors of Production.

The foremost cause of the operation of this law is that some of the factors of production are fixed during the short period. When the fixed factor is used with variable factor, then its ratio compared to variable factor falls. Production is the result of the co-operation of all factors. When an additional unit of a variable factor has to produce with the help of relatively fixed factor, then the marginal return of variable factor begins to decline.

3. Optimum Production:

After making the optimum use of a fixed factor, then the marginal return of such variable factor begins to diminish. The simple reason is that after the optimum use, the ratio of fixed and variable factors become defective. Let us suppose a machine is a fixed factor of production. It is put to optimum use when 4 labourers are employed on it. If 5 labourers are put on it, then total production increases very little and the marginal product diminishes.

4. Imperfect Substitutes:

Mrs. Joan Robinson has put the argument that imperfect substitution of factors is mainly responsible for the operation of the law of diminishing returns. One factor cannot be used in place of the other factor. After optimum use of fixed factors, variable factors are increased and the amount of fixed factor could be increased by its substitutes.

Such a substitution would increase the production in the same proportion as earlier. But in real practice factors are imperfect substitutes. However, after the optimum use of a fixed factor, it cannot be substituted by another factor.

3.5.3 Applicability of the Law of Variable Proportions:

The law of variable proportions is universal as it applies to all fields of production. This law applies to any field of production where some factors are fixed and others are variable. That is why it is called the law of universal application.

The main cause of application of this law is the fixity of any one factor. Land, mines, fisheries, and house building etc. are not the only examples of fixed factors. Machines, raw materials may also become fixed in the short period. Therefore, this law holds good in all activities of production etc. agriculture, mining, manufacturing industries.

1. Application to Agriculture:

With a view of raising agricultural production, labour and capital can be increased to any extent but not the land, being fixed factor. Thus when more and more units of variable factors like labour and capital are applied to a fixed factor then their marginal product starts to diminish and this law becomes operative.

2. Application to Industries:

In order to increase production of manufactured goods, factors of production has to be increased. It can be increased as desired for a long period, being variable factors. Thus, law of increasing returns operates in industries for a long period. But, this situation arises when additional units of labour, capital and enterprise are of inferior quality or are available at higher cost.

As a result, after a point, marginal product increases less proportionately than increase in the units of labour and capital. In this way, the law is equally valid in industries.

3.5.4 Postponement of the Law:

The postponement of the law of variable proportions is possible under following conditions:

(i) Improvement in Technique of Production:

The operation of the law can be postponed in case variable factors techniques of production are improved.

(ii) Perfect Substitute:

The law of variable proportion can also be postponed in case factors of production are made perfect substitutes i.e., when one factor can be substituted for the other.

Sub Unit-6: Theory of cost

3.6.1 Concept of different cost:

In traditional theory, costs are generalized in two parts on the basis of time period i.e. costs in short run and costs in long run period.

Costs are mainly of the following types:

1. Total cost
2. Average cost
3. Marginal cost.

I. Total Cost:

According to Dooley, "Total cost of production is the sum of all expenditure incurred in producing a given volume of output." In other words, the amount of money spent on the production of different levels of a good is called total cost. For instance, if a total sum of Rs. 2500 is spent on the production of 100 bicycles, then the total cost of producing 100 bicycles will be Rs. 2500. Since, there are two types of factors of production in the short run, so there are two types of costs.

Thus $TC = FC + VC$

TC → Total cost

FC → Fixed cost

VC → Variable cost

- **Fixed Costs or Supplementary Costs:**

The cost that remains fixed at any level of output is known as the fixed cost. These costs must be paid whether there is production or not. These costs include, depreciation allowance, interest on fixed capital, license fee, salaries to permanent staff etc.

In the words of Anatol Murad, "Fixed costs are costs which do not change with change in the quantity of output." These costs are also known as the overhead costs or indirect costs because a firm has to incur these costs even if it shuts down temporarily. Thus, fixed costs are unavoidable which occur even at the zero level of output.

Table-7 Fixed cost can be shown with the help of the table and diagram

Units of output	Fixed cost	Units of output	Fixed cost
1	40	5	40
1	40	6	40
2	40	7	40
3	40	8	40
4	40		

Total fixed cost can be explained as under :

TFC = Explicit Fixed Cost + Implicit cost

Or

TFC = Total Costs – Total variable costs

Or

TFC = TC – TVC

In Figure 28 quantity has been measured on horizontal axis while costs on vertical axis. As is clear from the fig. 28 that even at zero level of output a firm has to incur fixed costs equal to OP. In the figure, output increases from OX_1 to OX_2 to OX_3 but the fixed costs remain the same.

Variable Costs or Prime Costs:

Variable costs refer to those costs which change with the change in the volume of output. These costs are unavoidable or contractual costs. Marshall called these costs as "Prime Costs", "Direct Costs" or "Special Costs". Variable costs include expenditure on transport, wages of labour, electricity charges, price of raw material etc. Thus, according to Dooley, "Variable costs are one which varies as the level of output varies." It can be explained with the help of the below table and figure 29.

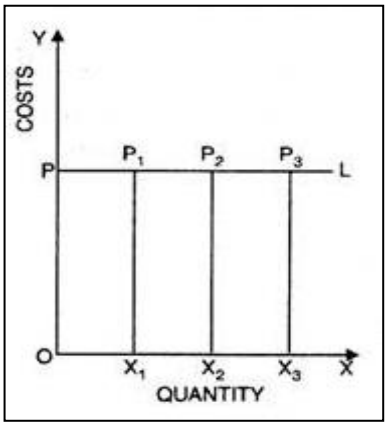


Figure-28

Table-8: shows the change in variable cost with the change in output

Unit or Output	Total variable cost	Unit or Output	Total variable cost
0	0	5	36
1	20	6	38
2	30	7	40
3	32	8	46
4	34		

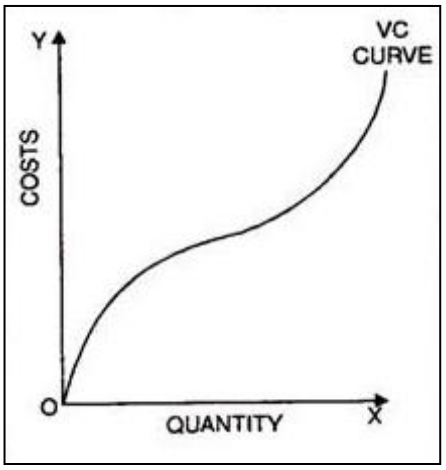


Figure-29

In the above Figure-29 variable cost curve starts from zero. It means when output is zero, variable costs are also zero. But as the output increases variable costs also increase. As evident from the fig that when output is 1 unit variable costs are Rs. 20. But, as the output increases to 3 units, variable costs also increase to the tune of Rs. 2.

- **Relation between Total, Fixed and Variable Costs:**

In order to determine the total costs of a firm, we aggregate fixed as well as variable costs at different levels of output i.e.

TC = TFC + TVC

TFC = TC – TVC

TVC = TC – TFC

Table-10: Shows the relation between output, fixed cost and total cost

Output	Fixed cost (1)	Variable cost (2)	Total cost(1+2)
0	40	0	40
1	40	20	60
2	40	30	70
3	40	32	72
4	40	34	74
5	40	36	76
6	40	38	78
7	40	40	80
8	40	46	86

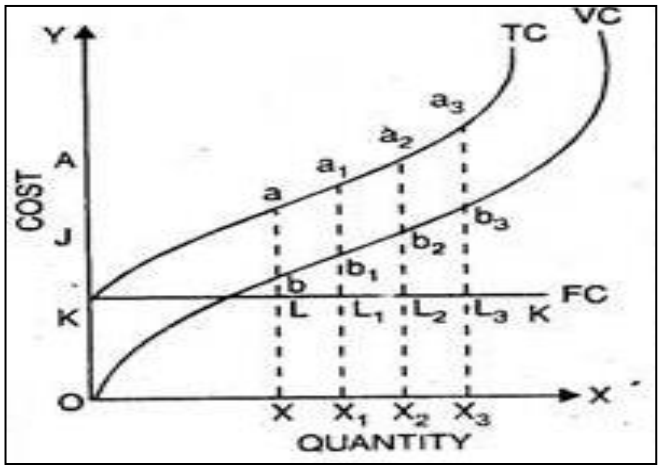


Figure-30

In above table, when output is zero, variable costs are also zero. But the fixed costs as well as total costs are 40. As the output increases to 8 units, total costs go up to 86. It means as the output increases fixed costs remain the same, but variable costs increase at a diminishing rate then at constant rate and ultimately at an increasing rate. The relationship has been shown in diagram.

In above Figure quantity is measured on horizontal axis while costs on vertical axis. KK is fixed cost curve which is parallel to horizontal axis which signifies the fact that at all levels of output, fixed costs remain the same. VC is the variable cost curve.

It is of the shape of reverse S. It means as the output is zero variable costs are also zero. But as the output increases, variable costs also start increasing, initially at diminishing rate, constant rate and then at an increasing rate.

- **Importance of Distinction between Fixed and Variable Costs:**

This distinction is important in price theory. Every firm has the object to maximize profits or minimize losses, if losses are unavoidable. At times the price of the product may not cover average total cost. Then the firm will have to decide whether to shut down or produce some output.

1. Decision to Shut Down the Firm:

The producer may not cover the total costs, if the price of the product is less than the short-run average cost. Then the distinction between fixed cost and variable costs must be kept in mind. Fixed costs are incurred even at zero output. They are unavoidable costs. Variable costs are incurred only when some output is produced.

If the price does not cover average variable costs, the firm prefers to shut down. In other words, if the total revenue (total sale proceeds) does not cover total variable costs, the firm must shut down. Otherwise, its total loss will be greater than the fixed costs. It will produce something only when the price covers average variable cost and part of the average fixed costs. The output at which marginal cost is equal to marginal revenue keeps losses minimum.

2. Break-Even Point:

At times the firm may not make any profit. It just pays to produce a given output. Total revenue is just equal to total cost. The firm has crossed the losses zone and is about to enter the zero-profit zone. The output at which total revenue becomes equal to total cost represents break-even point.

II. Average Cost:

According to Dooley, "The average cost of production is the total cost per unit of output." In other words average cost of production is the total cost of production divided by the total number of units produced.

Suppose, the total cost of producing 500 units is Rs. 1000, the average cost will be:

$$AC = \frac{TC}{Q}$$

AC = Average Cost

TC = Total Cost

Q = Output

$$AC = \frac{1000}{500} = 2$$

Table-11: Average variable cost, average fixed cost can be shown with the help of the table

Units	TFC	TVC	TC	AC(TC/q)	AFC(TFC/q)	AVC(TVC/q)
0	40	0	40	0	0	0
1	40	20	60	60	40	15
2	40	30	70	35	20	20
3	40	32	72	24	13.3	10.7
4	40	34	74	18.5	10	8.5
5	40	36	76	15.2	8	7.2
6	40	40	80	13	6.6	6.3
7	40	42	82	11.4	5.7	5.7
8	40	46	86	10.7	5	5.7
9	40	48	88	9.8	4.4	5.4

$$AC = \frac{TC}{q} \text{ Or } AFC + AVC$$

$$AFC = \frac{TFC}{q}$$

$$AVC = \frac{TVC}{q}$$

$$TC = TFC + TVC$$

Average Fixed Cost:

Average fixed cost is the total fixed cost divided by the number of units of output produced.

Thus:

$$AFC = \frac{TFC}{Q}$$

Q = Quantity of output

TFC = Total Fixed cost

AFC = Average Fixed Cost

For instance, when output is 200 units the total fixed costs for a firm are Rs. 2000 as

$$AC = \frac{2000}{200}$$

$$AC = 10$$

Since, total fixed cost is a constant quantity, average fixed cost will steadily fall as output increases, thus, the average fixed cost curve slopes downward throughout the length. It can be shown with the help of a graph below.

In the below figure the average fixed cost curve slopes downward with a view to touch the horizontal axis. But it will not be so because AFC can never be zero. Thus, it is clear that as output increases, average fixed costs go on diminishing.

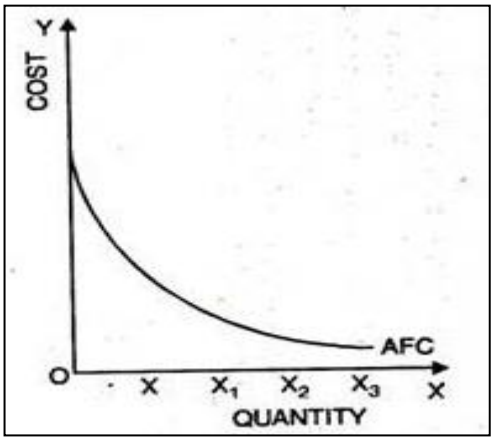


Figure-31

Average Variable Costs:

Average variable cost is the total variable cost divided by the number of units of output produced.

AVC = TVC / Q

AVC = Average variable costs.

TVC = Total variable costs Q = Output

Generally, the AVC falls as output increases from zero to the normal capacity output due to the law of increasing returns. But beyond the normal capacity output, the AVC will rise steeply because of the operation of the law of diminishing returns as has been shown in below figure.

In this Figure the average variable cost curve assumes the U- shape. Initially, the AVC curve falls, after having the minimum point the curve starts rising.

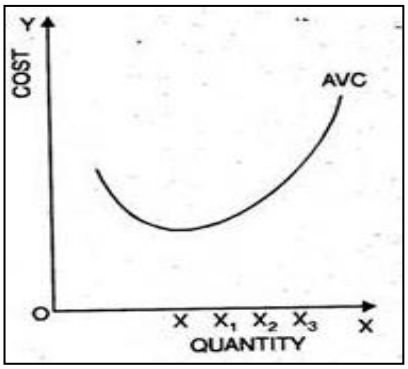


Figure-32

Relation between Average Cost, Average Fixed Cost and Average Variable Cost:
Average cost is the lateral summation of average fixed and average variable cost.

The following table-13 & fig.33 expresses their relationship

Units	TC	AC	AFC	AVC
1	80	80	50	30
2	100	50	25	25
3	115	38.3	16.6	21.7
4	145	36.2	12.5	23.7
5	185	37.0	10.0	27
6	235	39.1	8.3	30.8
7	295	42.1	7.1	35
8	390	48.7	6.2	42.5

Average cost can be calculated by dividing total cost with units of output (q). In the above table AFC diminishes with the increase in production whereas AVC diminishes up to third unit. Total average cost is minimum at fourth unit after that it starts increasing because AVC is also increasing. Fig. below shows that average cost curve is of U-shape.

Why the short-run AC is curve U-shaped?
In the short-run average cost curves are of U-shape. It means, initially it falls and after reaching the minimum point it starts rising upwards. It can be on account of the following reasons.

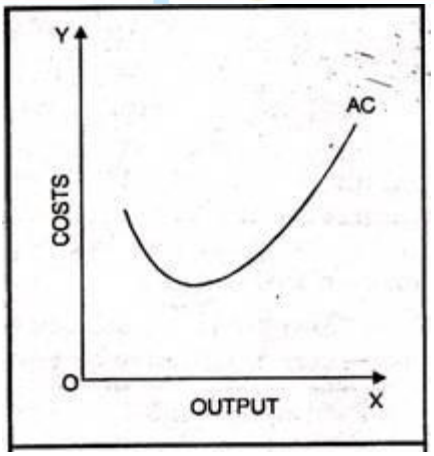


Figure-33

1. Basis of Average Fixed Cost and Average Variable Cost:
It is well known, that average cost is the aggregate of average fixed cost and average variable cost (AC = AFC + AVC). To begin with, as production increases, initially the average fixed cost and average variable cost falls. But after a minimum point, average variable cost stops falling but not the average cost. It is due to this reason that average variable cost reaches the minimum before AC.
The point, where AC is minimum is called the optimum point. After this point, AC begins to rise upward. The net result is the increase in AC. Therefore, it is only due to the nature of AFC and AVC that AC first falls, reaches minimum and afterwards starts rising upward and hence assume the U-shape.

2. Basis of the Law of Variable Proportion:

The law of variable proportion also results in U-shape of short run average cost curve. If in the short period variable factors are combined with a fixed factor, output increases in accordance with the law of variable proportions. In other words, the law of 'Increasing Returns' applies. Similarly, if we employ more and more variable factors with fixed factors the law of Diminishing Returns is said to apply. Thus, it is due to the law of variable proportions that the average cost curve assumes the shape of U.

3. Indivisibilities of the Factors:

Another reason due to which the average cost curve forms U-shape is the indivisibilities of factors. When in the short-run a firm increases its production due to indivisibilities of fixed factors, it gets various internal economies. It is these economies which cause the average cost curve to fall in the initial stage. Generally, there are three types of internal economies which help to bring down the cost viz., technical economies, marketing economies and managerial economies.

III. Marginal Cost:

The concept of marginal cost of production is recently developed by Austrian School of Economics. Marginal cost is an addition to the total cost caused by producing one more unit of output. For instance, the total cost for the production of 100 units is Rs. 5000. Suppose the production of one more unit costs Rs. 5000. It will be called the marginal cost.

MC= Marginal cost
TC_n= Total cost of units
TC_{n-1}= Total cost of n-1 units
ΔTC= Change in total cost
ΔQ= Change in output

Table-13: Realation between TC and MC

Units of Output	TC = TFC + TVC	MC = $(TC_n - TC_{n-1})$
1	60	–
2	70	10
3	76	6
4	78	2
5	84	6
6	90	6
7	108	18
8	130	22

From this table, we can draw the following conclusions :

(*i*) TC increases at diminishing rate upto 4 units.

(*ii*) TC increases at constant rate *i.e.* 4th to 5th unit.

(*iii*) TC increases at an increasing rate *i.e.* from 6th unit onwards.

In Figure 8 output has been measured on X-axis and costs on Y-axis. MC is marginal cost curve. It is also of U-shape which signifies the fact that as output is increased initially MC curve falls. The MC curve reaches the minimum point after that it starts rising in upward direction. It is only on account of this reason that MC curve is also of U-shape.

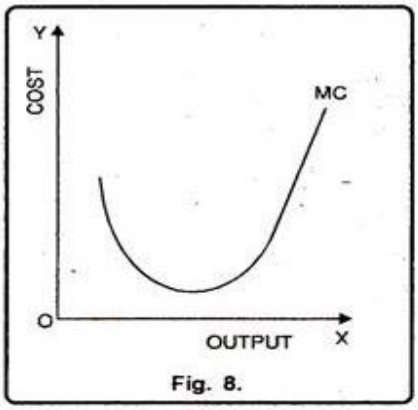


Fig. 8.

Why is the MC Curve of U-shape?

Marginal cost means the addition made to total cost on account of producing one more unit of output. In the beginning, when a firm increases its output, total costs as well as variable costs start increasing at a diminishing rate.

It is only due to the reason that in the initial stage of production law of increasing returns applies. Moreover, in the initial stage of production, the firm enjoys many economies which cause the MC to fall. As the output continues, marginal cost becomes minimum, thus, ultimately starts rising.

The reason being the operation of the Law of Diminishing Returns. In short, initially marginal cost falls and after having the minimum point it begins to rise. Thus, it is how the MC is also of U-shape.

- **Relation between Average and Marginal Cost:**

The relation between average and marginal cost can be explained with the help of following table:14.1

Output	Total cost	Average cost	Marginal cost
1	15	15	15
2	28	14	13
3	34	11.3	6
4	39	9.7	5
5	42	8.4	3
6	48	8.0	6

Main points of the relation are as under:

(1) Average Cost and Marginal Cost can be calculated from Total Cost:

Average cost and marginal cost can be calculated from total cost. As is known, average cost is the ratio of total cost to total output. In other words, AC is calculated by dividing the total cost by the quantity of output. It means.

$AC = TC / Q$

In the same way, marginal cost can also be calculated from total cost. It refers to an addition made to total output by producing one more unit of output. Thus,

$MC = TC_n - TC_{n-1}$

$MC = \Delta TC / \Delta Q$

(2) When average cost falls, MC also falls:

In this situation, rate of fall in marginal cost is more than fall in average cost. In other words, when AC curve is falling, MC curve will be below it. The reason behind this is that whereas average cost is the aggregate of average fixed cost and average variable cost, marginal cost refers only to change in average variable cost.

(3) When AC rises, MC also rises:
When average cost curve rises, marginal cost too rises, but rate of increase in marginal cost is more than that of average cost.

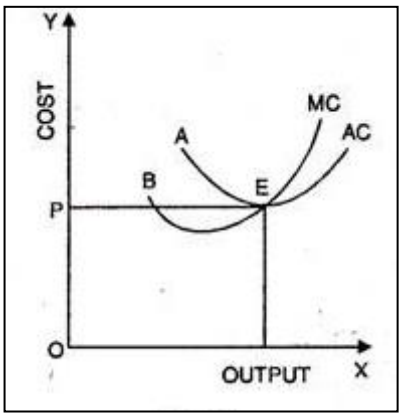


Figure-35

(4) MC cuts AC at its Lowest Point:
Marginal cost is equal to average cost when the latter is at its minimum. The minimum point of marginal cost occurs earlier than the average cost.

(5) When AC is constant MC becomes equal to AC:
When AC is constant, marginal cost first increases and then becomes equal to it. Figure 9 shows the picture more vividly.

(6) Use of MC and AC in Price Determination:
The concept of marginal cost is of great significance in finding out equilibrium output and that of average cost in finding out profit and loss. Equilibrium output is one at which marginal cost is equal to marginal revenue.

A firm earns normal profit when its average cost is equal to average revenue. It earns supernormal profit when average revenue is more than average cost. Moreover, a firm earns losses when average cost is more than average revenue.

(7) Mutual Interaction between MC and AC:
In Fig. 10 when marginal cost is more than average cost, average cost has a tendency to rise. It seems as if marginal cost curve is pulling the AC curve upward. On the other hand, when MC is less than AC, it pulls the AC ‘ curve downward. When MC is equal to AC then the latter is constant.

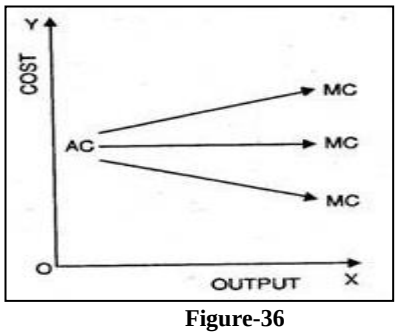


Figure-36

3.6.2 short-run and long-run cost curves:

Cost in Short Run:

It may be noted at the outset that, in cost accounting, we adopt functional classification of cost. But in economics we adopt a different type of classification, viz., behavioural classification- cost behaviour is related to output changes.

In the short run the levels of usage of some input are fixed and costs associated with these fixed inputs must be incurred regardless of the level of output produced. Other costs do vary with the level of output produced by the firm during that time period.

The sum-total of all such costs-fixed and variable, explicit and implicit- is short-run total cost. It is also possible to speak of semi-fixed or semi-variable cost such as wages and compensation of foremen and electricity bill. For the sake of simplicity we assume that all short run costs to fall into one of two categories, fixed or variable.

Short-Run Total Cost:

A typical short-run total cost curve (STC) is shown in Fig. 37. This curve indicates the firm's total cost of production for each level of output when the usage of one or more of the firm's resources remains fixed.

When output is zero, cost is positive because fixed cost has to be incurred regardless of output. Examples of such costs are rent of land, depreciation charges, license fee, interest on loan, etc. They are called unavoidable contractual costs. Such costs remain contractually fixed and so cannot be avoided in the short run.

The only way to avoid such costs is by going into liquidation. The total fixed cost (TFC) curve is a horizontal straight line. Total variable is the difference between total cost and fixed cost. The total variable cost curve (TVC) starts from the origin, because such cost varies with the level of output and hence are avoidable. Examples are electricity tariff, wages and compensation of casual workers, cost of raw materials etc.

In Fig. 37 the total cost (OC) of producing Q units of output is total fixed cost OF plus total variable cost (FC).

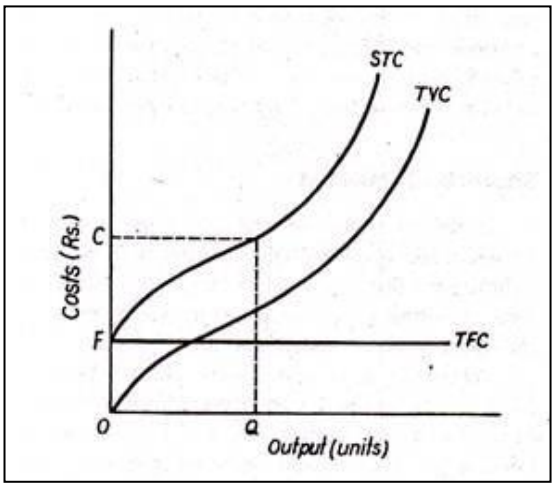


Figure-37

Clearly, variable cost and, therefore, total cost must increase with an increase in output. We also see that variable cost first increase at a decreasing rate (the slope of STC decreases) then increase at an increasing rate (the slope of STC increases). This cost structure is accounted for by the law of Variable Proportions.

Average and Marginal Cost:

One can gain a better insight into the firm's cost structure by analyzing the behaviour of short-run average and marginal costs. We may first consider average fixed cost (AFC).

Average fixed cost is total fixed cost divided by output,

i.e., AFC = TFC /Q

Since total fixed cost does not vary with output average fixed cost is a constant amount divided by output. Average fixed cost is relatively high at very low output levels. However, with gradual increase in output, AFC continues to fall as output increases, approaching zero as output becomes very large. In Fig. 38 we observe that the AFC curve takes the shape of a rectangular hyperbola.

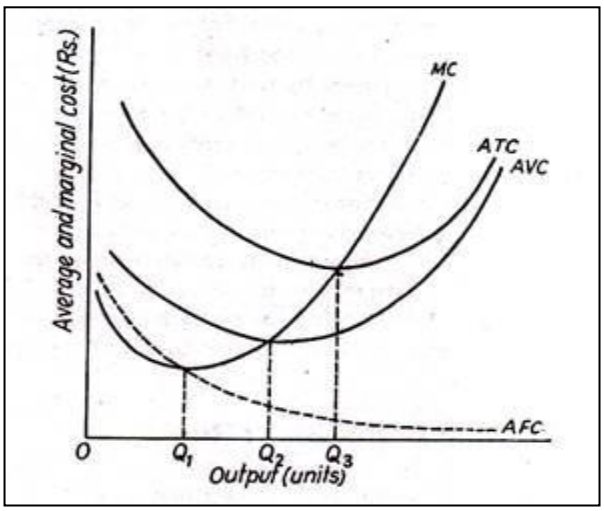


Figure-38

We now consider average variable cost (AVC) which is arrived at by dividing total variable cost by output,

i.e., AVC= — TVC/Q

In Fig. 38, AVC is a typical average variable cost curve. Average variable cost first falls, reaches a minimum point (at output level Q_2) and subsequently increases.

The next important concept is one of average total cost (ATC).

It is calculated by dividing total cost by output,

$$\text{i.e., } ATC = \frac{TC}{Q}$$

$$\text{Alternatively, } TC = TFC + TVC$$

$$\text{and } ATC = \frac{TFC}{Q} + \frac{TVC}{Q}$$

$$= AFC + AVC$$

It is, therefore, the sum of average fixed cost and average variable cost.

The ATC curve, illustrated, is U-shaped in Fig. 38 because the AVC cost curve is U-shaped. This is accounted for by the Law of Variable Proportions. It first declines, reaches a minimum (at Q_3 units of output) and subsequently rises. The minimum point on ATC is reached at a larger output than at which AVC attains its minimum. This point can easily be proved.

ATC = AFC + AVC

We know that and that average fixed cost continuously falls over the whole range of output. Thus, ATC declines at first because both AFC and AVC are falling. Even when AVC begins to rise after Q_2, the decrease in AFC continues to drive down ATC as output increases. However, an output of Q_3 is finally reached, at which the increase in AVC overcomes the decrease in AFC, and ATC starts rising.

Since ATC = AFC + AVC, the vertical distance between average total cost and average variable cost measures average fixed cost. Since AFC declines over the entire range of output. AVC becomes closer and closer to ATC as output increases.

We may finally consider short-run marginal cost (SMC). Marginal cost is the change in short-run total cost attributable to an extra unit of output: or

$$SMC = \frac{\Delta STC}{\Delta Q}$$

However, since $STC = TFC + TVC$,

$$SMC = \frac{\Delta TFC}{\Delta Q} + \frac{\Delta TVC}{\Delta Q}$$

$$= 0 + \frac{\Delta TVC}{\Delta Q}$$

$$= \frac{\Delta TVC}{\Delta Q}$$

Short-run marginal cost refers to the change in cost that results from a change in output when the usage of the variable factor changes. As Fig. 38 shows, marginal cost first declines, reaches a minimum at Q_x (note that minimum marginal cost is attained at a level of output less than that at which AVC and ATC attain their minimum) and rises thereafter.

The marginal cost curve intersects AVC and ATC at their respective minimum points. This result follows from the definitions of the cost curves. If marginal cost curve lies below average variable cost curve the implication is clear: each additional unit of output adds less to total cost than the average variable cost.

Thus, average variable cost has to fall. So long as MC is above AVC, each additional unit of output adds more to total cost than AVC. Thus, in this case, AVC must rise.

Thus, when MC is less than AVC, average variable cost is falling. When MC is greater than AVC, average variable cost is rising. Thus, MC must equal AVC at the minimum point of AVC. Exactly the same reasoning would apply to show MC crosses ATC at the minimum point of the latter curve.

a. Short-run Cost Functions:

Summary of the Main Points All the important short-run cost relations may now be summed up:

The total cost function may be expressed as:

TC = k + f(Q) where k is total fixed cost which is a constant, and f(Q) is total variable cost which is a function of output.

ATC = k/Q + f(Q)/ Q = AFC + AVC. Since k is a constant and Q gradually increases, the ratio k/Q falls. Hence the AFC curve is a rectangular hyperbola.

Here

$$MC = \frac{d(TC)}{dQ} = \frac{d}{dQ}(k) + \frac{d}{dQ}[f(Q)] = 0 + f'(Q)$$

where f'(Q) is the change in TVC and may be called marginal variable cost (MVC). Thus, it is clear that MC refers to MVC and has no relation to fixed cost. Since business decisions are largely governed by marginal cost, and marginal costs have no relation to fixed cost, it logically follows costs do not affect business decisions.

b. Relation between MC and AC:

There is a close relation between MC and AC. When AC is falling, MC is less than AC. This can be proved as follows:

When AC is falling,

$$\frac{d}{dQ}\left(\frac{TC}{Q}\right) < 0, \quad \text{or,} \quad \frac{Q \times \frac{dTC}{dQ} - TC}{Q^2} < 0,$$

$$\text{or,} \quad \frac{dTC}{dQ} - TC < 0$$

$$\text{or,} \quad \frac{dTC}{dQ} - \frac{TC}{Q} < 0$$

$$\text{or,} \quad \frac{dTC}{dQ} < \frac{TC}{Q}$$

$$\text{or,} \quad MC < AC.$$

C. Cost Elasticity:

On the basis of the relation between MC and AC we can develop a new concept, viz., the concept of cost elasticity. It measures the responsiveness of total cost to a small change in the level of output.

It can be expressed as:

$$E_C = \frac{\%\text{ change in } TC}{\%\text{ change in } Q} = \frac{\Delta TC/TC}{\Delta Q/Q}$$

$$= \frac{\Delta TC}{\Delta Q} \div \frac{TC}{Q} = MC \div AC.$$

So, it is the ratio of MC to AC.

The properties of the average and marginal cost curves and their relationship to each other are as described in Fig. 14.4. From the diagram the following relationships can be discovered.

(1) AFC declines continuously, approaching both axes asymptomatically (as shown by the decreasing distance between ATC and AVC) and is a rectangular hyperbola.

(2) AVC first declines, reaches a minimum at $Q_2$and rises thereafter. When AVC is at its minimum, MC equals AVC.

(3) ATC first declines, reaches a minimum at Q_3, and rises thereafter. When ATC is at its minimum, MC equals ATC.
(4) MC first declines, reaches a minimum at Q_1, and rises thereafter. MC equals both AVC and ATC when these curves are at their minimum values.
The lowest point of the AVC curve is called the shut (close)- down point and that of the ATC curve the break-even point. These two concepts will be discussed in the context of market structure and pricing. Finally, we see that MC lies below both AVC and ATC over the range in which these curves decline; contrarily, MC lies above them when they are rising.
Table 14.2 numerically illustrates the characteristics of all the cost curves. Column (5) shows that average fixed cost decreases over the entire range of output. Columns (6) and (7) depict that both average variable and average total cost first decrease, then increase, with average variable cost attaining a minimum at a lower output than that at which average total cost reaches its minimum. Column (8) shows that marginal cost per 100 units is the incremental increase in total cost and variable cost.

Table 14.2 : Short-run cost Schedules of a hypothetical firm

(1) Output	(2) Total cost	(3) Fixed cost	(4) Variable cost	(5) Average fixed cost	(6) Average variable cost	(7) Average total cost	(8) Marginal cost (per unit)
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
100	6,000	4,000	2,000	40.00	20.00	60.00	20.00
200	7,000	4,000	3,000	20.00	15.00	35.00	10.00
300	7,500	4,000	3,500	13.33	11.67	25.00	5.00
400	9,000	4,000	5,000	10.00	12.50	22.50	15.00
500	11,000	4,000	7,000	8.00	14.00	22.00	20.00
600	14,000	4,000	10,000	6.67	16.67	23.33	30.00
700	18,000	4,000	14,000	5.71	20.00	25.71	40.00
800	24,000	4,000	20,000	5.00	25.00	30.00	60.00
900	34,000	4,000	30,000	4.44	33.33	37.77	100.00
1,000	50,000	4,000	46,000	4.00	46.00	50.00	160.00

If we compare columns (6) and (8) we see that marginal cost (per unit) is below average variable and average total cost when each is falling and is greater than each when AVC and ATC are rising.

Long-Run Costs: The Planning Horizon:

We may recall from our discussion of production theory that the long run does not refer to 'some date in the future. Instead, the long run simply refers to a period of time during which all inputs can be varied.
Therefore, a decision has to be made by the owner and/or manager of the firm about the scale of operation, that is, the size of the firm. In order to be able to make this decision the manager must have knowledge about the cost of producing each relevant level of output. We shall now discover how to determine these long-run costs.'

Derivation of Cost Schedules from a Production Function:

For the sake of analysis, we may assume that the firm's level of usage of the inputs does not affect the input (factor) prices. We also assume that the firm's manager has already evaluated the production function for each level of output in the feasible range and has derived an expansion path.
For the sake of analytical simplicity, we may assume that the firm uses only two variable factors, labour and capital, that cost Rs. 5 and Rs. 10 per unit, respectively.

The characteristics of a derived expansion path are shown in Columns 1, 2 and 3 of Table 14.4. In column (1) we see seven output levels and in Columns (2) and (3) we see the optimal combinations of labour and capital respectively for each level of output, at the existing factor prices.

These combinations enable us to locate seven points on the expansion path.

Column (4) shows the total cost of producing each level of output at the lowest possible cost. For example, for producing 300 units of output, the least cost combination of inputs is 20 units of labour and 10 of capital. At existing factor prices, the total cost is Rs. 200. Here, Column (4) is a least-cost schedule for various levels of production.

In Column (5), we show average cost which is obtained by dividing total cost figures of Column (4) by the corresponding output figures of Column (1). Thus, when output is 100, average cost is Rs. 120/100 = Rs. 1.20. All other figures of Column (5) are derived in a similar way.

From column (5) we derive an important characteristic of long-run average cost: average cost first declines, reaches a minimum, then rises, as in the short-run. In Column (6) we show long-run marginal cost figures.

Each such figure is arrived at by dividing change in total cost by change in output. For example, when output increases from Rs. 100 to Rs. 200, the total cost increases from Rs. 120 to Rs. 140. Therefore, marginal cost (per unit) is Rs. 20/100 = Re. 0.20. Similarly, when output increases from 600 to 700 units, MC per unit is 720-560/100 =160/100 =1.60

Column (6) depicts the behaviour of per unit MC: marginal cost first decreases then increases, as in the short run.

We may now show the relationship between the expansion path and long-run cost graphically. In Fig. 39 two inputs, K and L, are measured along the two axes. The fixed factor price ratio is represented by the slope of the isocost lines $I_1I'_1$, $l_2l'_2$ and so on. Finally, the known production function gives us the isoquant map, represented by Q_1, $Q_2$and so forth.

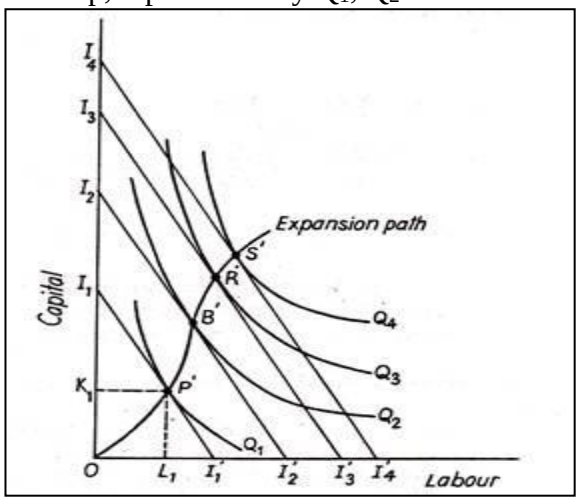


Figure-39

From our earlier discussion of long-run production function we know that, when all inputs are variable (that is, in long-run), the manager will choose the least cost combinations of producing each level of output. In Fig. 39, we see that the locus of all such combinations is expansion path OP' B'R'S'.

Given the factor-price ratio and the production function (which is determined by the state of technology), the expansion path shows the combinations of inputs that enables the firm to produce each level of output at the lowest cost.

Table-14.3 Derivation of long-run cost schedules

(1) Output (Units)	(2) Labour (Units)	(3) Least-cost usage of Capital of labour,	(4) Total cost at Rs. 5 per unit Rs. 10 per unit of capital	(5) Average cost	(6) Marginal cost (per Unit)
100	11	7	Rs. 120	Rs. 1.20	Rs. 1.20
200	12	8	140	Re. 0.70	Re. 0.20
300	20	10	200	0.67	0.60
400	30	15	300	0.75	1.00
500	40	22	420	0.84	Rs. 1.20
600	52	30	560	0.93	1.40
700	60	42	720	Rs. 1.03	1.60

We may now relate this expansion path to a long-run total cost (LRTC) curve. Fig. 40 shows the 'least cost curve' associated with expansion path in Fig. 39. This least cost curve is the long-run total cost curve. Points P,B,R and S are associated with points P', B', R' and S' on the expansion path. For example, in Fig. 14.6 the least cost combination of inputs that can produce Q_1 is K_1 units of capital and L_1 units of labour.

Thus, in Fig. 40, minimum possible cost of producing Q_1 units of output is TC_1, which is K_1 + wL_1, i.e., the price of capital (or the rate of interest) times K_1, plus the price of labour (or the wage rate) times L_1. Every other point on LRTC is derived in a similar way.

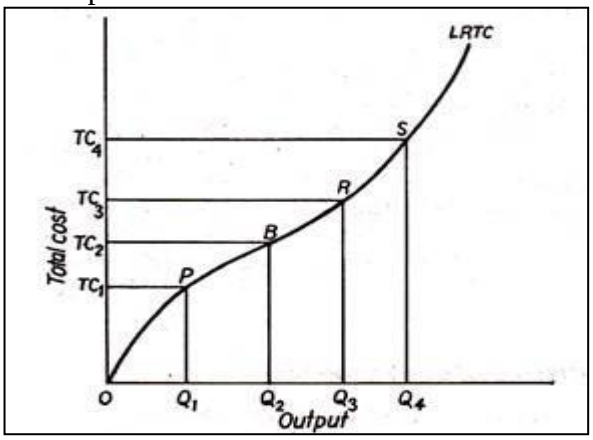


Figure-40

Since the long run permits capital-labour substitution, the firm may choose different combinations of these two inputs to produce different levels of output. Thus, totally different production processes may be used to produce (say) Q_1 and Q_2 units of output at the lowest attainable cost.

On the basis of this diagram we may suggest a definition of the long run total cost. The time period during which even/thing (except factor prices and the state of technology or art of production) is variable is called the long run and the associated curve that shows the minimum cost of producing each level of output is called the long- run total cost curve.

The shape of the long-run total cost (LRTC) curve depends on two factors: the production function and the existing factor prices. Table 14.4 and Fig. 40 reflect two of the commonly assumed characteristics of long-run total costs. First, costs and output are directly related; that is, the LRTC curve has a positive slope. But, since there is no fixed cost in the long run, the long run total cost curve starts from the origin.

Another characteristic of LRTC is that costs first increase at a decreasing rate (until point B in Fig. 40), and an increasing rate thereafter. Since the slope of the total cost curve measures marginal cost, the implication is that long-run marginal cost first decreases and then increases. It may be added that all implicit costs of production are included in the LRTC curve.

Long-Run Average and Marginal Costs:

We turn now to distinguish between long run average and marginal costs.

Long-run average cost is arrived at by dividing the total cost of producing a particular output by the number of units produced:

LRTC= LRTC/Q

Long-run marginal cost is the extra total cost of producing an additional unit of output when all inputs are optimally adjusted:

LRTC= Δ LRTC /ΔQ

It, therefore, measures the change in total cost per unit of output as the firm moves along the long run total cost curve (or the expansion path).

Fig. 41 illustrates typical long-run average and marginal cost curves. They have essentially the same shape and relation to each other as in the short run. Long-run average cost first declines, reaches a minimum (at Q_2 in Fig. 41), then increases. Long-run marginal cost first declines, reaches minimum at a lower output than that associated with minimum average cost (Q_1 in Fig. 41), and increases thereafter.

The marginal cost intersects the average cost curve at its lowest point (L in Fig. 41) as in the short-run. The reason is also the same. The reason has been aptly summarized by Maurice and Smithson thus: “When marginal cost is less than average cost, each additional unit produced adds less than average cost to total cost; so average cost must decrease.

When marginal cost is greater than average cost, each additional unit of the good produced adds more than average cost to total cost; so average cost must be increasing over this range of output. Thus marginal cost must be equal to average cost when average cost is at its minimum”.

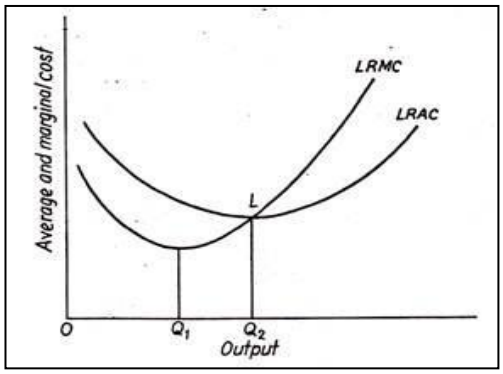


Figure-41

The Shape of the LAC: Economies and Diseconomies of Scale:

The shape of the long-run average cost depends on certain advantages and disadvantages associated with large scale production. These are known as economies and diseconomies of scale.

Economies of Scale:

Various factors may give rise to economies of scale, that is, to decreasing long-run average costs of production.

Greater Specialization of Resources:

With an expansion of a firm's scale of operation, its opportunities for specialization—whether performed by men or by machines—are greatly enhanced. It is because a large-scale firm can often divide the tasks and work to be done more readily than a small-scale firm.

More Efficient Utilization of Equipment:

In some industries, the technology of production is such that a large unit of costly equipment has to be used. The production of automobiles, steel and refined petroleum are obvious examples.

In such industries, companies must be able to afford whatever equipment is necessary and must be able to use it efficiently by spreading the cost per unit over a sufficiently large volume of output. A small-scale firm cannot ordinarily do these things.

Reduced Unit Costs of Inputs:

A large-scale firm can often buy its inputs-such as its raw materials-at a cheaper price per unit and thus gets discounts on bulk purchases. Moreover, for certain types of equipment, the price per unit of capacity is often much less than larger sizes purchased.

For instance, the construction cost per square foot for a large factory is usually less than that for a small one. Again, the price per horsepower of various electric motors varies inversely with the amount of horsepower.

Utilization of by-products:

In certain industries, larger-scale firms can make effective use of many by-products that would go waste in a small firm. A typical example is the sugar industry, where by-products like molasses and bagasse are made use of.

Growth of Auxiliary Facilities:

In certain places, an expanding firm often benefits from, or encourages other firms to develop, ancillary facilities, such as warehousing, marketing, and transportation systems, thus saving

the growing firm considerable costs. For example, commercial and industrial establishments often benefit from improved transportation and warehousing facilities.

Diseconomies of Scale:

With continuous expansion of the scale of operation of a firm, a point may ultimately be reached when diseconomies of scale begin to exercise a more than offsetting effect on the firm's cost curve. As a result, the long-run average cost curve starts to rise.

This is attributable to the following two main reasons:

Decision-Making Role of Management:

As a firm becomes larger, heavier burdens are placed on the management so that eventually this resource input is overworked relative to others and 'diminishing returns' to management set in. In fact, management is an indivisible input which is not capable of continuous variation. With increase in the size of organisation there occurs delay in decision-making.

Competition for Resources:

Rising long-run average costs can occur as a growing firm increasingly bids labour or other resources away from other industries. In the real world, it is very difficult, if not virtually impossible, to determine just when diseconomies of scale are encountered and when they become strong enough to outweigh the economies of scale.

In business where economies of scale are negligible, diseconomies may soon assume paramount significance causing LAC to turn up at a relatively small volume of output. Panel A of Fig. 42 shows a long run average cost curve for a firm of this type. In other cases, economies of scale assume strategic significance.

Even after the efficiency of management starts declining, technological economies of scale may offset the diseconomies over a wide range of output. Thus, the LAC curve may not slope upward until a very large volume of output is produced. This case (typified by the so-called natural monopolies) is illustrated in Panel B of Fig. 42.

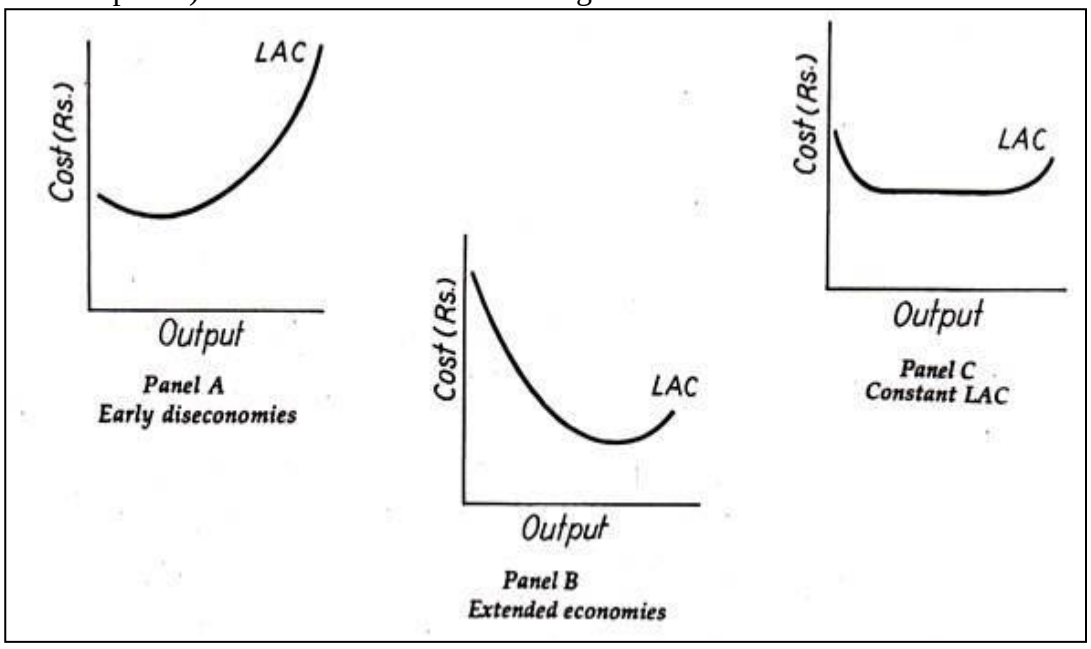


Figure-42

In many actual situations, however, neither of these extremes describes the behaviour of LAC. A very modest scale of operation may not set in until a very large volume of output is produced. In such a situation, LAC would have a long horizontal section as shown in Panel C of Fig. 42. It is widely agreed by economists and business executives that this type of LAC curve describes many production processes in the real commercial world. For theoretical analysis, however, we continue to assume a "representative" LAC, such as that illustrated earlier in Fig. 41.

Average Cost in the Long Run: Smooth Envelope Case:

We know that in the short-run the firm has a fixed plant and it has a short run U-shaped cost curve SAC. If a new and larger plant is built, the new SAC will be drawn further to the right. We assume that the firm is still in the planning stage and yet to undertake any fixed commitment. It can now draw all possible different U-shaped SAC curves, from which to choose one SAC for each specified level of output that promises the lowest cost. As output increases, the firm moves to a new SAC curve.

In the long run, the firm can change the size of the plant. Starting from zero output level, successively larger plants typically have lower and lower ATC up to some output level and then successively higher ATC curves beyond. The three representative ATC curves associated with the three successively larger plants are shown in Fig. 43.

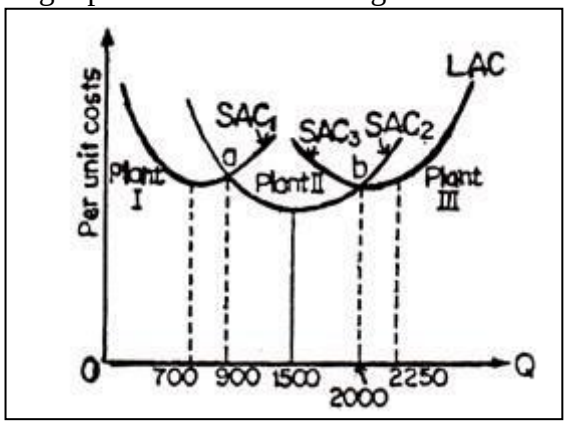


Figure-43

Plant I is the best plant for output levels less than 900 units because its AC curve is the lowest to the left of point a. Plant II is the best plant size for output levels between 900 to 2,000 units, because its AC curve is the lowest between point a and b. Plant III is the best plant size for output levels greater than 2,000 units, since its AC curve is the lowest beyond point b.

If these are only three possible plant sizes, the long run ATC curve will consist of the segments of Plant I's AC curve up to point a, the segment of plant II's AC curve between points a and b, and the segment of Plant Ill's AC curve from point of b and so on. The thick LAC is composed of the three lowest branches of SACs. This is why the LAC is called the envelope curve

Fig. 44 is the smooth envelope case. Writes Samuelson: "In the long run, a firm can choose its best plant sizes and its lower envelope curve." Since there is an infinite number of choices, we get LAC as a smooth envelope. And, as in the short-run, we can derive LMC from LAC, and LMC emerges from the minimum point of LAC with a smoother slope than the SMC curve.

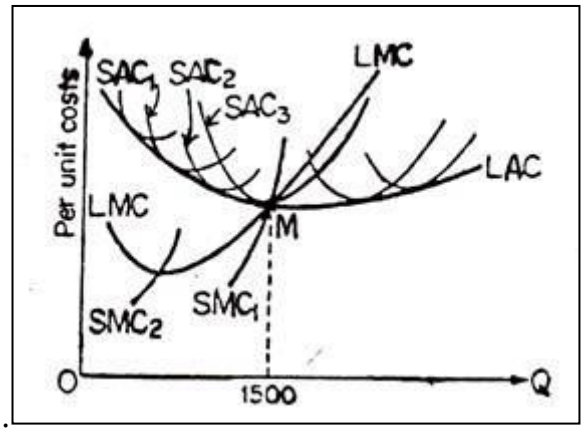


Figure-44

➢ Theory of Absolute Cost Advantage

Adam Smith is generally ignored as a trade theorist in text books of international economics because of the common belief that he only confirmed the rule of absolute advantages to explain the structure of foreign trade.

However, his vent-for-surplus approach may be interpreted as a pioneering study which stresses the importance of economies of scale in explaining the structure of trade.

Economists recognize the undeniable influence of Smith's concepts such as "extent of the market", "division of labour", "improved dexterity in every particular workman", and "simple inventions coming from workman" on trade theory.

Adam Smith propounded the theory of absolute cost advantage as the basis of foreign trade; under such circumstances an exchange of goods will take place only if each of the two countries can produce one commodity at an absolutely lower production cost than the other country.

Absolute differences in production costs

Country	Commodity	
	A	B
Country I	10	20
Country II	20	10

Suppose, there are two countries I & II and two commodities A and B. For example, country can produce a unit of commodity (A) with 10 and a unit of commodity (B) with 20 labour units, and that in country II, the production of a unit of (A) costs 20 and a unit of (15) 10 labour units. Now country I has absolute cost advantage in tin- production of (A) and it will confine itself to the production of (A) and country II in the production of (B). Exactly the same would happen if I and II were two regions of one country. We speak of an absolute- differences in costs because each country can produce one commodity at an absolutely lower cost them the other. Thus, in such a situation, a division of labour between them must lead to an increase in total output.

Sub Unit-7: Price determination under different market forms

3.7.1 Perfect competition

Perfect competition is defined as a market situation where there are a large number of sellers of a homogeneous product. An individual firm supplies a very small portion of the total output and is not powerful enough to exert an influence on the market price.

A single buyer, however large, is not in a position to influence the market price. Market price in a perfectly competitive market is determined by the interaction of the forces of market demand and market supply. Market demand means the sum of the quantity demanded by individual buyers at different prices.

Similarly, market supply is the sum of quantity supplied by the individual firms in the industry. Each seller and buyer takes the price as determined. Therefore, in a perfectly competitive market, the main problem for a profit-maximizing firm is not to determine the price of its product but to adjust its output to the market price so that profit is maximized.

- **Price determination under perfect competition is analyzed under three different time periods:**

(a) Market Period
(b) Short Run
(c) Long Run

(a) Market Period:

In a market period, the time span is so short that no firm can increase its output. The total stock of the commodity in the market is limited. The market period may be an hour, a day or a few days or even a few weeks depending upon the nature of the product.

For example, in the case of perishable commodities like vegetables, fish, eggs, the period may be a day. Since the supply of perishable commodities is limited by the quantity available or stock in day that neither can be increased nor can be withdrawn for the next period, the whole of it must be sold away on the same day, whatever may be the price.

Fig 45 shows that the supply curve of perishable commodities like fish is perfectly inelastic and assumes the form of a vertical straight line SS. Let us suppose that the demand curve for fish is given by dd. Demand curve and supply curve intersect each other at point R, determining the price OP. If the demand for fish increases suddenly, shifting the demand curve upwards to d'd'.

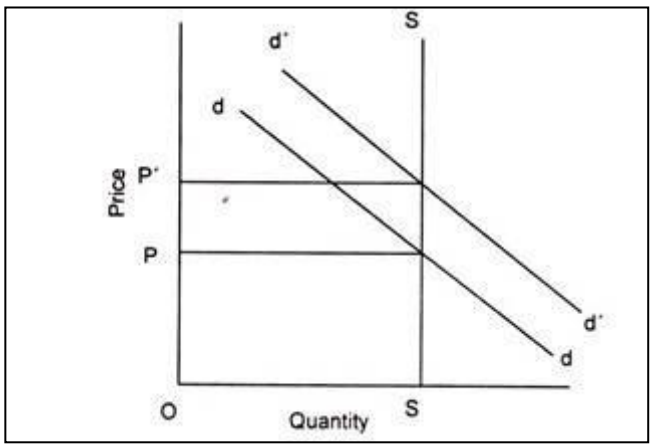


Figure-45

The equilibrium point shift from R to R" and the price rises to OP'. In this situation, price is determined solely by the demand condition that is an active agent.

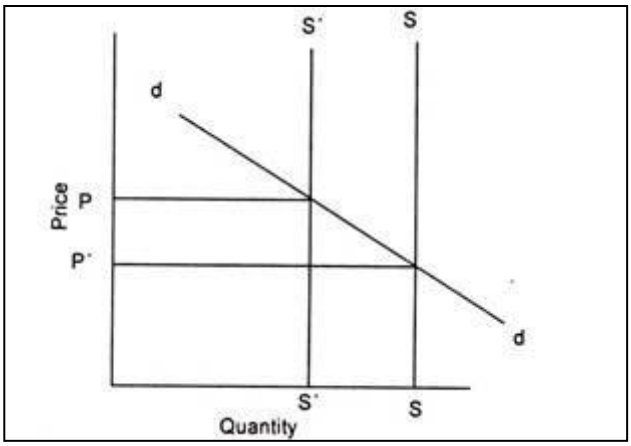


Figure-46

Similarly, if the demand for a product is given, as shown in demand curve SS in figure 46 If the supply of the product decreases suddenly from SS to S'S', the price increases from P to P'. In this case price is determined by supply, the supply being an active agent.

In this case supply curve shifts leftward causing increase in price of the reduced supply goods. Given the demand curve dd and supply curve SS, the price is determined at OP. Demand curve remaining the same, the decrease in supply shifts the supply curve to its left to S'S'. Consequently, the price rises from OP to OP'.

The supply curve of non-perishable but reproducible goods will not be a vertical straight line throughout its length. This is for certain goods can be withdrawn from the market if the price is too low as the seller would not sell any amount of the commodity in the present market period and would like to hold back the whole stock.

The price below which the seller declines to offer for any amount of his product is known as 'reserve price'. Thus, the seller faces two extreme price-levels; at one he is ready to sell the whole stock and the other he refuses to sell any. The amount he offers for sale will vary with price.

The seller will be ready to supply more at a higher price rather than at a lower one will depend upon his anticipations of future price and intensity of his need for cash. The supply curve of a seller will, therefore, slope upwards to the right up to the price at which he is ready to sell the whole stock. Beyond this point, the supply curve will become a vertical straight line whatever the price.

(b) Pricing in the Short Run- Equilibrium of the Firm:

Short period is the span of time so short that existing plants cannot be extended and new plants cannot be erected to meet increased demand. However, the time is adequate enough for producers to adjust to some extent their output to the increase in demand by overworking their fixed capacity plants. In the short run, therefore, supply curve is elastic.

Figure 47 shows the average and marginal cost curves of the firm together with its demand curve. Demand curve, in a perfectly competitive market, is also the average revenue curve and the marginal revenue curve of the firm. The marginal cost intersects the average cost at its

minimum point. The U-shape of both the cost curves reflects the law of variable proportions operative in the short run during which the size of the plant remains fixed.

The firm is in equilibrium at the point B where the marginal cost curve intersects the marginal revenue curve from below:

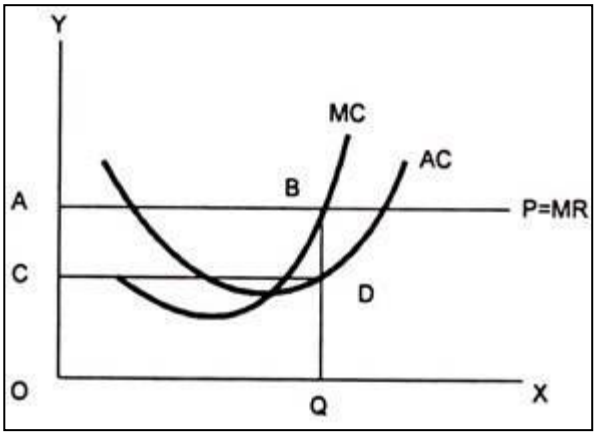


Figure-47

The firm supplies OQ output. The QC is the average cost and the firm earns total profit equal to the area shown by ABCD. The firm maximizes its profit. Earlier to the point of equilibrium, the firm does not attain the maximum profit as each additional unit of output brings more revenue that its cost. Any level of output greater than OQ brings less marginal revenue than marginal cost.

For the equilibrium of a firm the two conditions must be fulfilled:

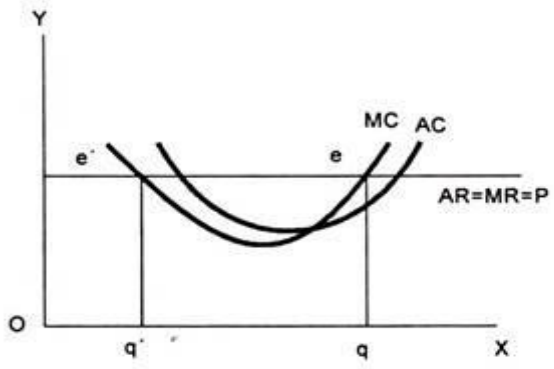


Figure-48

(a) The marginal cost must be equal to the marginal revenue. However, this condition is not sufficient, since it may be fulfilled and yet the firm may not be in equilibrium. Figure 48 shows that marginal cost is equal to marginal revenue at point e', yet the firm is not in equilibrium as Oq output is greater than Oq'.

(b) The second and necessary condition for equilibrium requires that the marginal cost curve cuts the marginal revenue curve from below i.e. the marginal cost curve be rising at the point of intersection with the marginal revenue curve.

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 curve cuts the marginal revenue curve from below.

The fact that a firm is in equilibrium does not imply that it necessarily earns supernormal profits. In the short-run equilibrium firms may earn supernormal profits, normal profits or may incur losses.

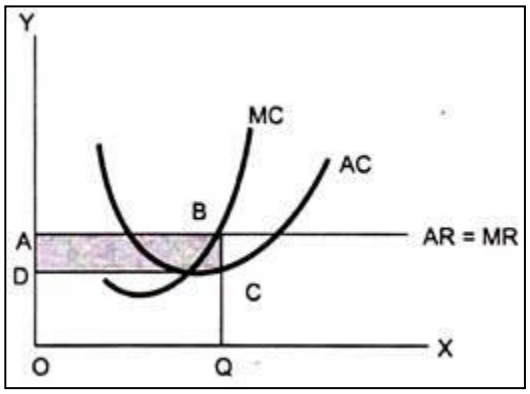


Figure-49

Whether the firm makes supernormal profits, normal profits or incurs losses depends on the level of the average cost at the short run equilibrium. If the average cost is below the average revenue, the firm earns supernormal profits. Figure 49 illustrates that the average cost QC is less than average revenue QB, and the firm earns profits equal to the area ABCD.

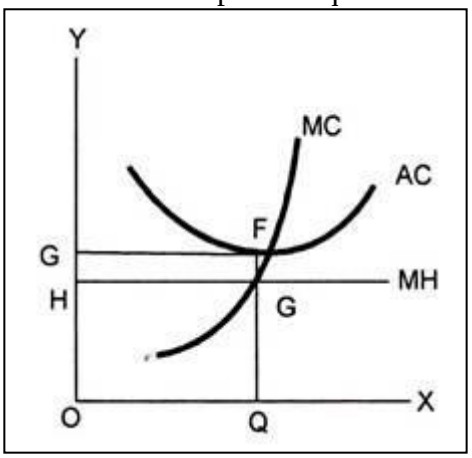


Figure-50

If the average cost is above the average revenue the firm makes a loss. Figure 50 shows that the Average cost QF is higher than QG average revenue and the firm is incurring loss equal to the shaded area EFGH. In this case the firm will continue to produce only if it is able to cover its variable costs.

Otherwise it will close down, since by discontinuing its operations the firm is better off; it minimizes its losses. The point at which the firm covers its variable costs is called 'the closing-down point'. If the price falls below or average costs rise, the firm does not cover its variable costs and is better off if it closes down. Figure 4.7 explains shut- down point.

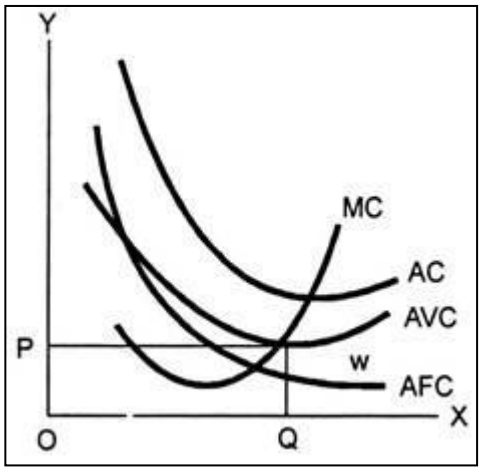


Figure-51

Equilibrium of the Industry:

An industry is in equilibrium at that price at which the quantity demand is equal to the quantity supplied.

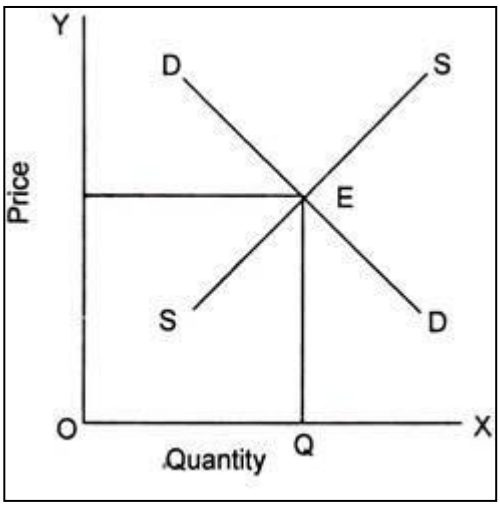


Figure-52

Figure 52 explains that DD is the industry demand and SS the industry supply. The point E at which industry demand and industry supply equalizes, the price OP is determined. OQ is the quantity demanded and quantity supplied. This, however, is a short run equilibrium where at the market-determined price some firms may be making supernormal profits, normal profits or making losses. In the long run the firms may not continue incurring losses. Loss making firms that cannot adjust their plant will close down.

Firms that are making supernormal profits will expand their capacity. Simultaneously new firms will be attracted into the industry. Free movement of firms in and outside the industry and readjustment of the existing firms in the industry will establish a long run equilibrium in which firms will just be earning normal profits and there will be no tendency of entry or exit from the industry.

(c) Pricing 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 non- 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 firm 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. The average total cost is of determining importance, since in the long run all costs are variable and none fixed.

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 competition 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 or 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 loses. 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, price must equal marginal and 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, 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.

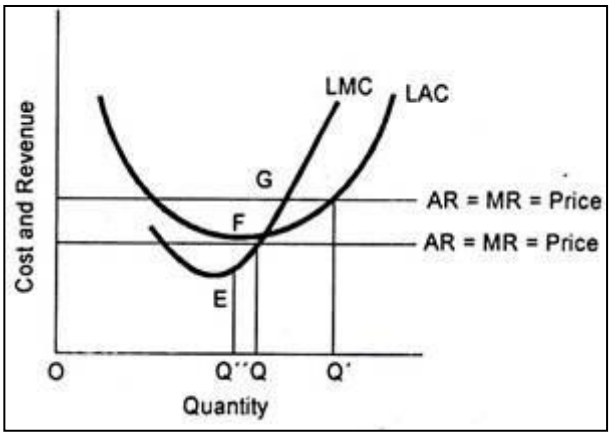


Figure-53

The conditions for the long run equilibrium of the firm under perfect competition can be easily understood from the Fig. 53 where LAC is the long run average cost curve and LMC in the long run marginal cost curve. The firm under perfect competition cannot be in long run equilibrium at price OP', because though the price OP' equals MC at G (i.e., at output OQ) 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 attraction 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 F and is producing OQ" output.

At point F or equilibrium output OQ", the price is equal to average cost, and hence the firm will be earning only normal profits. Therefore, at price OP, there will be no tendency for the outside firms to enter the industry. Hence, the firm will be in equilibrium at OP price and OQ output.

On the contrary, a firm under perfect competition cannot be in the long run equilibrium at price OP". Though price OP" is equal to marginal cost at point E, or at output OQ" but price OP" 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 firm 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, to 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 OQ, 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.

3.7.2 Monopolistic competition:

In monopolistic competition, the market has features of both perfect competition and monopoly. A monopolistic competition is more common than pure competition or pure monopoly. In this article, we will understand monopolistic competition and look at the features, price-output determination, and conditions for equilibrium.

In order to understand monopolistic competition, let's look at the market for soaps and detergents in India. There are many well-known brands like Lux, Rexona, Dettol, Dove, Pears, etc. in this segment.

Since all manufacturers produce soaps, it appears to be an example of perfect competition. However, on close scrutiny, we find that each seller varies the product slightly to make it different from its competitors.

Hence, Lux focuses on making beauty soaps, Liril on freshness, Dettol on antiseptic properties, Dove on smooth skin, etc. This allows each seller to attract buyers to itself based on some factor other than price.

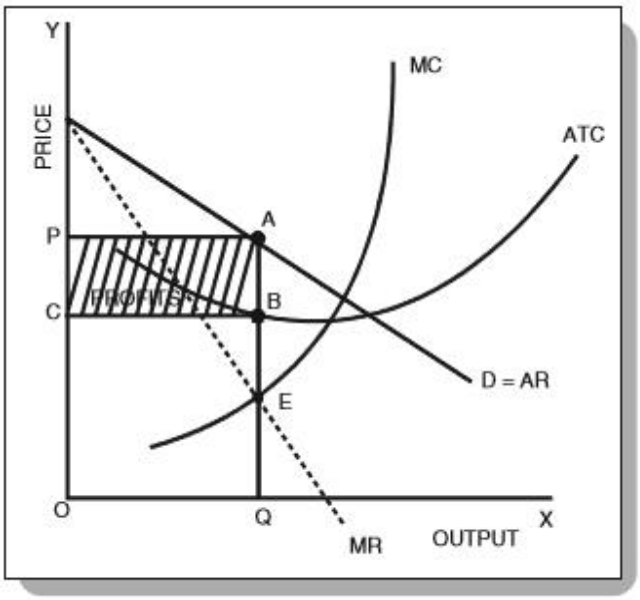
This market has a mix of both perfect competition and monopoly and is a classic example of monopolistic competition.

Features of Monopolistic Competition

1. ***Large number of sellers:*** In a market with monopolistic competition, there are a large number of sellers who have a small share of the market.
2. ***Product differentiation:*** In monopolistic competition, all brands try to create product differentiation to add an element of monopoly over the competing products. This ensures that the product offered by the brand does not have a perfect substitute. Therefore, the manufacturer can raise the price of the product without having to worry about losing all its customers to other brands. However, in such a market, while all brands are not perfect substitutes, they are close substitutes for each other. Hence, the seller might lose at least some customers to his competitors.
3. ***Freedom of entry or exit:*** Like in perfect competition, firms can enter and exit the market freely.
4. ***Non-price competition:*** In monopolistic competition, sellers compete on factors other than price. These factors include aggressive advertising, product development, better distribution, after sale services, etc. Sellers don't cut the price of their products but incur high costs for the promotion of their goods. If the firms indulge in price-wars, which is the possibility under perfect competition, some firms might get thrown out of the market.

- **Price-output determination under Monopolistic Competition:** Equilibrium of a firm

In monopolistic competition, since the product is differentiated between firms, each firm does not have a perfectly elastic demand for its products. In such a market, all firms determine the price of their own products. Therefore, it faces a downward sloping demand curve. Overall, we can say that the elasticity of demand increases as the differentiation between products decreases.



Short run equilibrium of a firm in monopolistic competition : Super-normal profits

Figure-54

Fig. 54 above depicts a firm facing a downward sloping, but flat demand curve. It also has a U-shaped short-run cost curve.

Conditions for the Equilibrium of an individual firm

The conditions for price-output determination and equilibrium of an individual firm are as follows:

1. MC = MR
2. The MC curve cuts the MR curve from below.

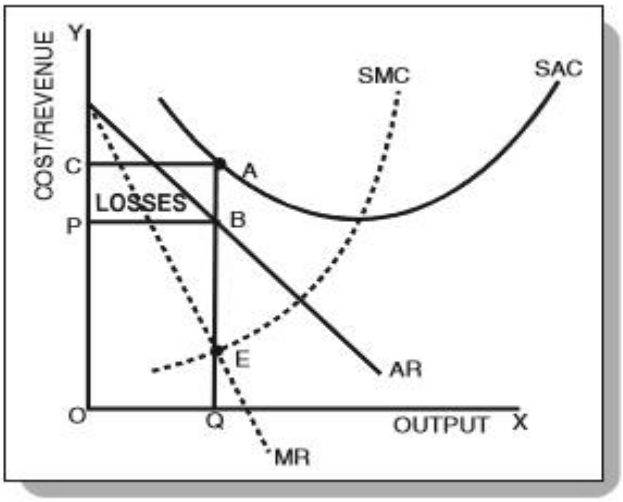
In Fig. 54, we can see that the MC curve cuts the MR curve at point E. At this point,

- Equilibrium price = OP and
- Equilibrium output = OQ

Now, since the per unit cost is BQ, we have

- Per unit super-normal profit (price-cost) = AB or PC.
- Total super-normal profit = APCB

The following figure depicts a firm earning losses in the short-run.



Short run equilibrium of a firm in Monopolistic Competition – With losses

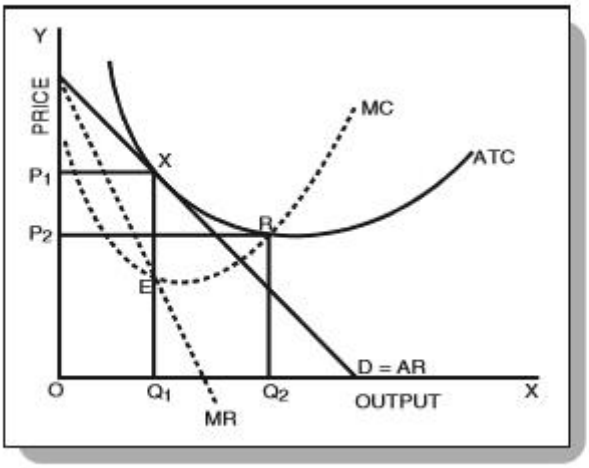
Figure-55

From Fig. 55, we can see that the per unit cost is higher than the price of the firm. Therefore,

- AQ > OP (or BQ)
- Loss per unit = AQ – BQ = AB
- Total losses = ACPB

Long-run equilibrium

If firms in a monopolistic competition earn super-normal profits in the short-run, then new firms will have an incentive to enter the industry. As these firms enter, the profits per firm decrease as the total demand gets shared between a larger number of firms. This continues until all firms earn only normal profits. Therefore, in the long-run, firms, in such a market, earn only normal profits.



The long-term equilibrium of a firm in monopolistic competition

Figure-56

As we can see in Fig. 56 above, the average revenue (AR) curve touches the average cost (ATC) curve at point X. This corresponds to quantity Q_1 and price P_1. Now, at equilibrium (MC = MR), all super-normal profits are zero since the average revenue = average costs. Therefore, all firms earn zero super-normal profits or earn only normal profits.

It is important to note that in the long-run, a firm is in an equilibrium position having excess capacity. In simple words, it produces a lower quantity than its full capacity. From Fig. 3 above, we can see that the firm can increase its output from $Q_1$to Q_2 and reduce average costs. However, it does not do so because it reduces the average revenue more than the average costs. Hence, we can conclude that in monopolistic competition, firms do not operate optimally. There always exists an excess capacity of production with each firm.

In case of losses in the short-run, the firms making a loss will exit from the market. This continues until the remaining firms make normal profits only.

3.7.3 Oligopoly-price leadership model: Oligopoly is a common market form where a number of firms are in competition. As a quantitative description of oligopoly, the four-firm concentration ratio is often utilized. This measure expresses, as a percentage, the market share of the four largest firms in any particular industry.

For example, Car industry – economies of scale have cause mergers so big multinationals dominate the market. The biggest car firms include Toyota, Hyundai, Ford, General Motors etc.

- Petrol retail
- Pharmaceutical industry
- Coffee shop retail – Starbucks, Costa Coffee, Cafe Nero
- Newspapers – In UK market share dominated by tabloids Daily Mail, The Sun, The Mirror, The Star, Daily Express.
- Book retail – In UK market share is dominated by Waterstones, Amazon and smaller firms like Blackwells.

**** Main Characteristics of Oligopoly:**

a. Profit maximization conditions

An oligopoly maximizes profits.

b. Ability to set price

Oligopolies are price setters rather than price takers.

c. Entry and exit

Barriers to entry are high. The most important barriers are government licenses, economies of scale, patents, access to expensive and complex technology, and strategic actions by incumbent firms designed to discourage or destroy nascent firms. Additional sources of barriers to entry often result from government regulation favouring existing firms making it difficult for new firms to enter the market.

d. Number of firms

"Few" – a "handful" of sellers. There are so few firms that the actions of one firm can influence the actions of the other firms.

e. Long run profits

Oligopolies can retain long run abnormal profits. High barriers of entry prevent sideline firms from entering market to capture excess profits.

f. Product differentiation

Product may be homogeneous (steel) or differentiated (automobiles).

g. Perfect knowledge

Assumptions about perfect knowledge vary but the knowledge of various economic factors can be generally described as selective. Oligopolies have perfect knowledge of their own cost and demand functions but their inter-firm information may be incomplete. Buyers have only imperfect knowledge as to price, cost and product quality.

h. Interdependence & Market Strategy

The distinctive feature of an oligopoly is interdependence. Oligopolies are typically composed of a few large firms. Each firm is so large that its actions affect market conditions. Therefore, the competing firms will be aware of a firm's market actions and will respond appropriately.

i. Market Leadership:

The oligopoly may also be characterized by the leadership of a dominant firm while all other firms follow the leader with regard to price and other matters. However, if no single firm is in such a commanding position, two or three of firms may collectively play the role of market leader. In case all the firms are more or less equally powerful such a leadership may not arise.

In nutshell, though the market leadership is a commonly visible feature of oligopoly, it is not at all a necessary condition. An oligopoly can function even without a market leader.

j. An Indeterminate Demand and Price Rigidity:

An oligopolistic firm cannot construct its demand curve for sure since market response to a change in price by a firm will significantly depend upon the rivals' reaction. This makes a firm's demand as indeterminate. The demand curve of an oligopolistic firm can at best be represented by a kinked demand curve reflecting upon considerable price rigidity. It is also marked by a high level of uncertainty.

However, if the firms ignore interdependence, a standard demand curve showing inverse price quantity relationship can be established. Many models of price determination, such as Cournot, are developed on such an assumption.

k. Selling Cost:

Similar to monopolistic competition, the oligopolistic firms too, heavily relies on the selling cost which includes advertisements, discount schemes, celebrity endorsement and so on. All these are part of their non-price market competition strategies.

Given that the price rigidity is a strong feature of oligopoly, through such non-price measures only the firms ensure that their respective market shares are maintained. Since all the firms in the market adopt such instruments, though to a varying extent, it may not lead to any significant rise in market share of any of them.

How firms compete in oligopoly

There are different possible ways that firms in oligopoly will compete and behave this will depend upon:

- The objectives of the firms; e.g. profit maximization or sales maximization?
- The degree of contestability; i.e. barriers to entry.
- Government regulation.

There are different possible outcomes for oligopoly:

1. Stable prices (e.g. through kinked demand curve) – firms concentrate on non-price competition.
2. Price wars (competitive oligopoly)
3. Collusion- leading to higher prices.

The kinked demand curve model (By American economist Sweezy)

This model suggests that prices will be fairly stable and there is little incentive for firms to change prices. Therefore, firms compete using non-price competition methods.

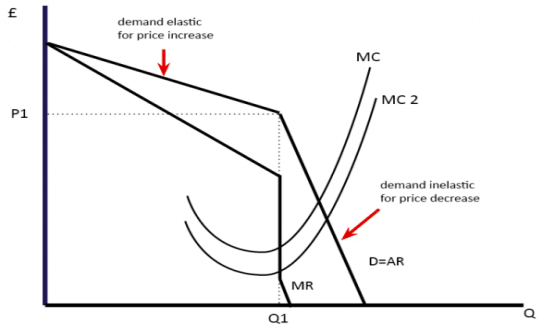


Figure-57

- This assumes that firms seek to maximize profits.
- If they increase the price, then they will lose a large share of the market because they become uncompetitive compared to other firms. Therefore, demand is elastic for price increases.
- If firms cut price then they would gain a big increase in market share. However, it is unlikely that firms will allow this. Therefore, other firms follow suit and cut-price as well. Therefore, demand will only increase by a small amount. Therefore, demand is inelastic for a price cut.
- Therefore, this suggests that prices will be rigid in oligopoly

  The diagram above suggests that a change in marginal cost still leads to the same price, because of the kinked demand curve. Profit maximization occurs where MR = MC at Q1.

Evaluation of kinked demand curve

- In the real world, prices do change.
- Firms may not seek to maximize profits, but prefer to increase market share and so be willing to cut prices, even with inelastic demand.
- Some firms may have very strong brand loyalty and be able to increase the price without demand being very price elastic.
- The model doesn't suggest how prices were arrived at in the first place.

Price wars

Firms in oligopoly may still be very competitive on price, especially if they are seeking to increase market share. In some circumstances, we can see oligopolies where firms are seeking to cut prices and increase competitiveness.

A feature of many oligopolies is selective price wars. For example, supermarkets often compete on the price of some goods (bread/special offers) but set high prices for other goods, such as luxury cake.

Collusion

- Another possibility for firms in oligopoly is for them to collude on price and set profit maximizing levels of output. This maximizes profit for the industry.

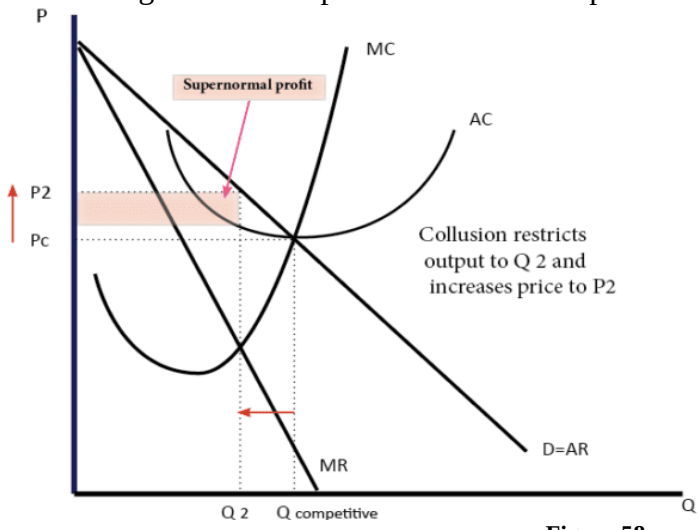


Figure-58

In the above example, the industry was initially competitive (Qc and Pc). However, if firms collude, they can agree to restrict industry supply to Q2, and increase the price to P2. This enables the industry to become more profitable. At Qc, firms made normal profit. But, if they can stick to their quotas and keep the price at P2, they make supernormal profit.

- Collusion is illegal, but tacit collusion may be hard to spot.
- For collusion to be effective, there need to be barriers to entry.
- A cartel is a formal collusive agreement. For example, OPEC is a cartel seeking to control the price of oil.

  See: Collusion

Collusion and game theory

Game theory is looking at the decisions of firms based on the uncertainty of how other firms will react. It illustrates the concept of interdependence. For example, if a firm agrees to collude and set low output – it relies on the other firm sticking to the collusive agreement. If the firm restricts output (sets the High price), and then the other firm betrays its agreement (setting low price). The firm will be worse off.

	Firm A High price	Low Price
Firm B High Price	*(collusion)* (A) £8m, (B) £8m	(A) £1m, (B)£10m
Low price	(A) £10m, (B) £1m	*(non-collusion)* (A) £3m, (B) £3m

This shows different options. If the market is non-collusive, firms make £3m each. If they collude, they make £8m. But there is an incentive for firms to exceed quota and increase output. Collusion and game theory are more complex if we add in the possibility of firms being fined by a government regulator.

Collusion is illegal and firms can be fined. Usually, the first firm who confesses to the regulator is protected from prosecution, so there is always an incentive to be the first to confess.

3.7.4 Monopoly-Price discrimination:

In monopoly, there is a single seller of a product called monopolist. The monopolist has control over pricing, demand, and supply decisions, thus, sets prices in a way, so that maximum profit can be earned.

The monopolist often charges different prices from different consumers for the same product. This practice of charging different prices for identical product is called price discrimination.

According to Robinson, "Price discrimination is charging different prices for the same product or same price for the differentiated product."

According to Stigler, "Price discrimination is the sale of various products at prices which are not proportional to their marginal costs."

In the words of Dooley, "Discriminatory monopoly means charging different rates from different customers for the same good or service."

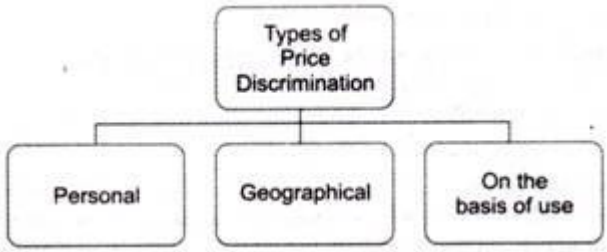
According to J.S. Bains, "Price discrimination refers strictly to the practice by a seller to charging different prices from different buyers for the same good."

Let us learn different types of price discrimination.

Types of Price Discrimination:

Price discrimination is a common pricing strategy' used by a monopolist having discretionary pricing power. This strategy is practiced by the monopolist to gain market advantage or to capture market position.

There are three types of price discrimination, which are shown below:



The different types of price discrimination are explained as follows:

i. Personal:

Refers to price discrimination when different prices are charged from different individuals. The different prices are charged according to the level of income of consumers as well as their willingness to purchase a product. For example, a doctor charges different fees from poor and rich patients.

ii. Geographical:

Refers to price discrimination when the monopolist charges different prices at different places for the same product. This type of discrimination is also called dumping.

iii. On the basis of use:

Occurs when different prices are charged according to the use of a product. For instance, an electricity supply board charges lower rates for domestic consumption of electricity and higher rates for commercial consumption.

Degrees of Price Discrimination:

Price discrimination has become widespread in almost every market. In economic jargon, price discrimination is also called monopoly price discrimination or yield management. The degree of price discrimination vanes in different markets.

These three degrees of price discrimination (as shown in Figure-14) are explained as follows:

i. First-degree Price Discrimination:

Refers to a price discrimination in which a monopolist charges the maximum price that each buyer is willing to pay. This is also known as perfect price discrimination as it involves maximum exploitation of consumers. In this, consumers fail to enjoy any consumer surplus. First degree is practiced by lawyers and doctors.

ii. Second-degree Price Discrimination:

Refers to a price discrimination in which buyers are divided into different groups and different prices are charged from these groups depending upon what they are willing to pay. Railways and airlines practice this type of price discrimination.

iii. Third-degree Price Discrimination:

Refers to a price discrimination in which the monopolist divides the entire market into submarkets and different prices are charged in each submarket. Therefore, third-degree price discrimination is also termed as market segmentation.

In this type of price discrimination, the monopolist is required to segment market in a manner, so that products sold in one market cannot be resold in another market. Moreover, he/she should identify the price elasticity of demand of different submarkets. The groups are divided according to age, sex, and location. For instance, railways charge lower fares from senior citizens. Students get discount in cinemas, museums, and historical monuments.

Necessary Conditions for Price Discrimination:

Price discrimination implies charging different prices for identical goods.

It is possible under the following conditions:

i. Existence of Monopoly:

Implies that a supplier can discriminate prices only when there is monopoly. The degree of the price discrimination depends upon the degree of monopoly in the market.

ii. Separate Market:

Implies that there must be two or more markets that can be easily separated for discriminating prices. The buyer of one market cannot move to another market and goods sold in one market cannot be resold in another market.

iii. No Contact between Buyers:

Refers to one of the most important conditions for price discrimination. A supplier can discriminate prices if there is no contact between buyers of different markets. If buyers in one market come to know that prices charged in another market are lower, they will prefer to buy it in other market and sell in own market. The monopolists should be able to separate markets and avoid reselling in these markets.

iv. Different Elasticity of Demand:
Implies that the elasticity of demand in the markets should differ from each other. In markets with high elasticity of demand, low price will be charged, whereas in markets with low elasticity of demand, high prices will be charged. Price discrimination fails in case of markets having same elasticity- of demand.

Advantages and Disadvantages of Price Discrimination: A monopolist practices price discrimination to gain profits. However, it acts as a loss for the consumers.
Following are some of the advantages of price discrimination:

i. Helps organizations to earn revenue and stabilize the business
ii. Facilitates the expansion plans of organizations as more revenue is generated
iii. Benefits customers, such as senior citizens and students, by providing them discounts
In spite of advantages, there are certain disadvantages of price discrimination.
Some of the disadvantages of price discrimination as follows:
i. Leads to losses as some consumers end up paying higher prices
ii. Involves administration costs for separating markets.

Sub Unit-8: Price strategies

3.8.1 Price skimming:

Under this strategy a high introductory price is charged for an innovative product and later on the price is reduced when more marketers enter the market with same type of product for example, Sony, Philips etc. when they introduce a new technology then a high price is charged for the product.

When the same technology is used by other electronic companies in their product also then the price is reduced. Generally, innovators use price skimming strategy to get reward for their research and development.

The price skimming strategy cannot be used by every marketer. For using this strategy following conditions are must:

(a) The product must be highly distinctive and demand for that product must be very inelastic:

The high introductory price can be charged only for unique products and the products for which easy substitutes are not available customers pay high price for the product for its novelty and uniqueness e.g., Rolex watches, Rolls Royce.

(b) The company must be able to maintain its uniqueness for some time:

If the product can be copied easily then price skimming will not bring revenue for a longer time.

(c) Presence of class market segment:

To use price skimming strategy there must be customers in the market who value the uniqueness of the product and are ready to pay high price.

This policy is shown where the manufacturer of new product initially determines OP price and sells OQ quantity. Thus, he receives KPMN abnormal profit. Under this policy, consumers are distinguished by the producers on the basis of their intensity of desire for a commodity.

For example, in the beginning the prices of computers, TVs, electronic calculators, etc., were very high but now they are declining every year. A high initial price together with heavy promotional expenditure may be used to launch a new product if conditions are appropriate.

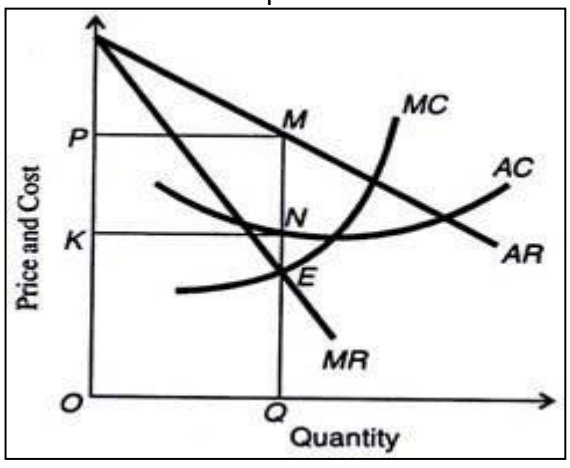


Figure-59

These conditions are listed below:

(i) Demand is likely to be less price elastic in the early stages than later. The cross elasticity demand should be very low.

(ii) Launching a new product with a high price is an efficient device for breaking the market into segments that differ in price elasticity of demand.

(iii) When the demand elasticity is unknown, high introductory price serves as a refusal price during the stage of exploration.

(iv) High initial prices help to finance the floatation of the product. In the early stages, the cost of production and organization of distribution are high. In addition, research and promotional investments have to be made.

3.8.2 Price penetration:

This strategy means using lower initial price to capture a large market. These forces the customers to buy the product and company can capture a very big share and leave very small share for competitors. Penetration pricing is attractive when following conditions are satisfied:

(i) The price elasticity of demand is high and easy substitutes of that product are available.

(ii) The firm can increase its production capacity with increase in demand.

(iii) When customers are highly price sensitive which means customers easily shift to another brand if it is available at low price.

(iv) When company has to face high competition while launching the product.

The Reliance Company followed penetration pricing strategy when it introduced mobile phone. It offered it at so low price that it captured big share of mobile phone market.

Penetration price is explained, where market price is OP_0, and quantity demanded is OQ_0. Now the producer of a new product fixes the price less than the market price i.e., OP_1 and sells OQ_1 more quantity. Obviously, it has a wide potential market.

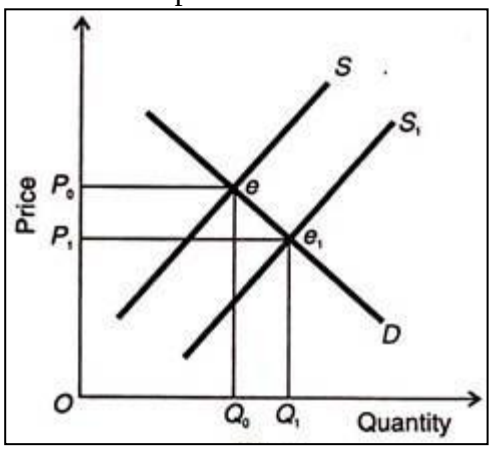


Figure-60

The comparison between skimming pricing and penetration pricing is that high skimming price policy needs vigorous and costly promotional effort to back it but low penetration price would require low promotional expenditures.

But the policy is inappropriate where:
(i) The total market is expected to stay small, and
(ii) The new product calls for capital recovery over a long period.

3.8.3 Peak Load Pricing

For goods and services, demand peaks at particular times — for roads and public transport during commuter rush hours, for electricity during late afternoon and so on.
MC is also high during these peak periods because of capacity constraints. Prices should, thus, be higher during peak periods where D_1 is the demand curve for the peak period, and D_2 is the demand curve for non-peak period.
The firm sets MC = MR for each period, such that price P_1 is high for the peak period, and the price P_2 is lower for the off-peak period, with corresponding quantities Q_1 and Q_2. This increases the firm's profit above what it would be if it charged one price for all periods. It is also efficient; the sum of producer and consumer's surplus is greater because prices are closer to MC.

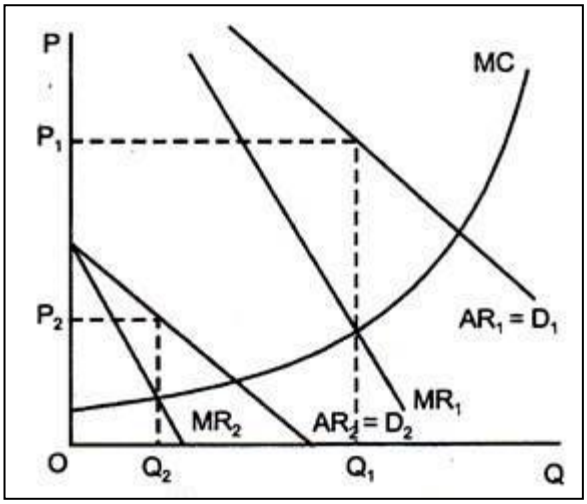


Figure-61

Peak-load pricing is different from third-degree price discrimination. With third-degree price discrimination, MR has to be equal for each group of consumers and equal to MC because the cost of serving the different groups is not independent. However, price and sales in peak and off-peak period can be determined independently by setting MC = MR for each period
For example, a movie theatre, which charges more for the evening show than for the matinee show because for theatres, the MC of serving customers during the matinee show is independent of the MC during the evening.
The owner of a movie theatre can determine the optimal prices for the evening and matinee shows independently, using estimates of demand in each period and of MC.

- **Some of the important types of pricing strategies normally adopted by firm are as follows:**

1. Pricing a New Product:

Pricing is a crucial managerial decision. Most companies do not encounter it in a major way on a day-to-day basis. But there is need to follow certain additional guidelines in the pricing of the new product. The marketing of a new,' product poses a problem for any firm because new products have no past information.

Here the firm is also not in a position to determine consumer reaction. The question is, what do we mean by a new product? New products for our purposes will include original products, improved products, modified products and new brands that the firm develops through its own R&D efforts.

When fixing the first price, the decision is obviously a major one. When the company introduces its product for the first time, the whole future depends heavily on the soundness of initial pricing decision. Top management is accountable for the new product's success record.

Top management must establish specific criteria for acceptance of new product ideas especially in a large multidivisional company where all kinds of projects bubble up as favourites of various managers. There are always competitors who would also like to produce it at the earliest opportunity. Pricing decision assumes special importance when one or more competitors change their prices or products or both.

Sometimes, the competitors may introduce a new brand without altering the price of an existing brand. If the new brand is perceived to compete with a given brand more effectively, then the firm in question may have to think on its pricing policy once again.

The price fixed for the new product must:

(i) Earn good profits for the firm over the life of the product;

(ii) Provide better quality at a cheaper price and at a faster speed than competitors;

(iii) Face rising R & D, manufacturing and marketing costs and

(iv) Satisfy public criteria such as consumer safety and ecological compatibility.

The firm can select two types of strategy:

(A) Skimming Pricing

(B) Penetration Pricing

(A) Skimming Pricing:

Skimming pricing is known as charging high price in initial stages. This can be followed by a firm by charging skimming price for a new product in pioneering stage. When demand is either unknown or more inelastic at this stage, market is divided into segments on the basis of different degree of elasticity of demand of different consumers.

This is a short period device for pricing. The demand for new products is likely to be less price elastic in the early stages, that is, the initial high price helps to "Skim the Cream" of the market which is relatively insensitive to price.

This policy is shown in Fig. 1, where the manufacturer of new product initially determines OP price and sells OQ quantity. Thus he receives KPMN abnormal profit. Under this policy, consumers are distinguished by the producers on the basis of their intensity of desire for a commodity.

For example, in the beginning the prices of computers, T.Vs, electronic calculators, etc., were very high but now they are declining every year. A high initial price together with heavy promotional expenditure may be used to launch a new product if conditions are appropriate.

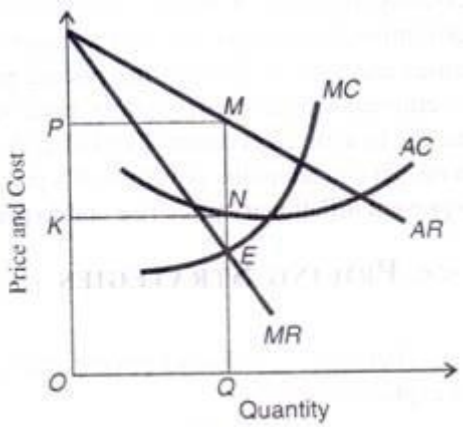


Figure: 62

These conditions are listed below:

(i) Demand is likely to be less price elastic in the early stages than later. The cross elasticity demand should be very low.

(ii) Launching a new product with a high price is an efficient device for breaking the market into segments that differ in price elasticity of demand.

(iii) When the demand elasticity is unknown, high introductory price serves as a refusal price during the stage of exploration.

(iv) High initial prices help to finance the floatation of the product. In the early stages, the cost of production and organization of distribution are high. In addition, research and promotional investments have to be made.

(B) Penetration Pricing:

Penetration price is known as charging lowest price for the new product. This is aimed to quick in sales, capture market share, utilize full capacity and economies of scale in productive process and keep the competitors away from the market.

Penetration price policy can be adopted in the following circumstances:

(i) There is very high price elasticity of demand.

(ii) There are substantial cost savings due to enhanced production process.

(iii) By nature, the product is acceptable to the mass of consumers.

(iv) There is no strong patent protection.

(v) There is imminent threat of potential competition so that a big share of the market must be captured quickly.

Penetration price is a long-term pricing strategy and should be adopted with great caution. Penetration pricing is successful also when there is no elite market. When a firm adopts a penetrating pricing policy, adjustments to price throughout the product life cycle are minimal. Since this policy prevents competition, it is also referred to as 'Stay-out' price policy.

Penetration price is explained in Fig. 2, where market price is OP_o, and quantity demanded is OQ_o. Now the producer of a new product fixes the price less than the market price i.e., $OP_1$and sells OQ_1more quantity. Obviously, it has a wide potential market.

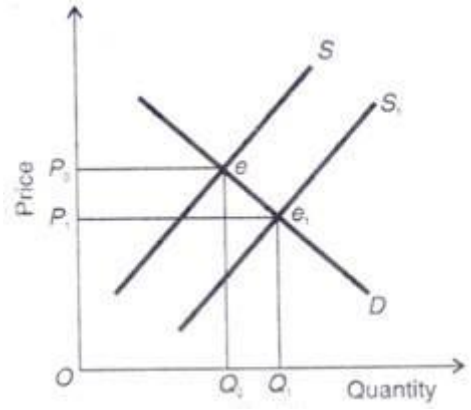


Figure: 63

The comparison between skimming pricing and penetration pricing is that high skimming price policy needs vigorous and costly promotional effort to back it but low penetration price would require low promotional expenditures.

But the policy is inappropriate where

(i) The total market is expected to stay small, and

(ii) The new product calls for capital recovery over a long period.

2. Multiple Products:

The traditional theory of price determination is based on the assumption that the firm produces a single homogeneous product. But firms usually produce more than one product. When firms produce several products, managers must consider the interrelationships between those products.

Such products may be joint products or multi-products. Joint products are those where inputs are common in productive process. Multi-products are creation of the product line activity with independent inputs but common overhead expenses. Pricing of multi-product or joint product requires little extra caution and care.

For evolving price policy for multi-product firm, certain basic considerations involved in decision making are:

(i) Price and cost relationship in product line,

(ii) Demand relationship in product line, and

(iii) Competitive differences.

They are explained as follows:

(i) Price and Cost Relationship:

For evolving a price policy for any product, price and cost relationship is the basic consideration. Cost conditions determine price. Therefore, cost estimates should be correctly made. Although a firm must recover its common costs, it is not necessary that prices of each product be high enough to cover an arbitrarily apportioned share of common costs.

Proper pricing does require, however, that prices at least cover the incremental cost of producing each good. Incremental costs are additional costs that would not be incurred if the product were not produced. As long as the price of a product exceeds its incremental costs, the firm can increase total profit by supplying that product.

Hence decisions should be based on an evaluation of incremental costs. A price that offers maximum contribution over costs is generally acceptable but in multi-product cases, incremental cost becomes more essential to make such decisions.

A set of alternative price policies should be considered and they are:

(i) Prices of multi-products may be proportional to full cost. This price may produce equal percentage of profit margin for all products. If the full cost for all products are assumed equal then the pricing will be equal.

(ii) Pricing for multi-products may be proportional to incremental cost.

(iii) Prices of multi-products may be assessed with reference to their contribution margin as proportional to conversion cost.

(iv) Prices of multi-product may be fixed differently keeping into consideration market segments.

(v) Prices for multi-products may be fixed as per the product life cycle of each product.

(ii) Inter-relation of Demand for Multi-product:

Demand inter-relationships arise because of competition in which case they become substitutes or they may be complementary goods. Sale of one product may affect the sale of another product. Different demand elasticity of different consumers may allow the firm to follow policies of price discrimination in different market segments. Two products of the same price may be substitutes to each other with cross elasticity of demand due to high degree of competitiveness.

In such a situation, pricing of the multi-products will have to be done in such a long way that maximum return could be obtained from each market segments by selling maximum products. Demand inter-relationships in the case of multiple products make it clear that we should take into account a thorough analysis of the total effect of the decision on the firm s revenues.

(iii) Competitive Differences:

Yet another important point should be considered for making price decisions, for a product line is the assessment of degree of competitiveness. Such an assessment will set up market share for each product. A product having large market share can stand a high makeup and can contribute to bear the losses.

There is competition among a few sellers of a relatively homogeneous product that has enough cross elasticity of demand so that each seller must in his pricing decisions take account of rivals' reaction. Each producer is actually aware of the disastrous effects that an announced reduction of his own price would have on the prices charged by competitors. The firm should also analyses whether the competitors have free entry to the market or not.

Marginal Technique for Pricing Multi-products:

Marginal technique for pricing multi-products is based on the logic that when the firm has spare capacity, unutilized technical resources, managerial and organizational abilities and capabilities, the firm enters into production of various other products with most profitable uses of alternatives.

The product is technically independent in the production process. For selecting these alternatives, the firm considers marginal costs of each such alternative and adopts those which offer higher margin on cost through sales.

Since each additional unit produced entails an additional cost as well as generates additional revenue, the logic of profit maximization stresses that production should be stabilized at a point where MR just covers MC. 'Marginal cost more accurately reflects those changes in costs

which result from a decision. Marginal pricing is more useful because of the prevalence of multi-product firms.

A firm shall produce the multi-product to the level where MR from sales of all these products equals the MC. If MC is more than MR, then the firm shall stop producing and selling one of the products which offer less MR than MC.

Pricing of Multiple Products or Joint Products:

Products can be related in production as well as demand. One type of production interdependency exists when goods are jointly produced in fixed proportions. The process of producing mutton and hides in a slaughter house is a good example of fixed proportion in production. Each carcass provides a certain amount of mutton and hide.

There is little that the slaughter house can do to alter the proportion of the two products. When goods are produced in fixed proportion they should be thought of as a 'product package'. Because there is no way to produce one part of this package without also producing the other part, there is no conceptual basis for allocating total production costs between the two goods.

Pricing of joint products can be explained under two different circumstances:

(i) When there is fixed proportion of products.

(ii) When there is variable proportion of products.

(i) Joint Products with Fixed Proportion:

In joint product case with fixed proportion of quantity, there is no possibility of increasing one at the expense of another. In this situation, the costs are joint and cannot be increased at the expense of another. In this situation, the costs are joint and cannot be allocated to each product on any sound basis. Although the two goods are produced together, their demands are independent.

However, there is a single marginal cost curve for both products. This reflects the fixed proportion of production, i.e., the marginal cost is the cost of supplying one more unit of the product package. Where goods are jointly produced as in the case of mutton and hides, pricing decision should take this interdependency into account.

Figure-64 indicates how profit maximizing prices and quantities are determined. P_M and P_H represent the most profitable prices for the joint products. The figure carries the assumption that each product is produced in fixed proportion because the output point for both is one and the same whereas their demand and marginal revenue curves are separate for different markets existing for them. MR_M and MR_H are the marginal revenue curves for mutton and hides respectively. But when an additional animal is processed at a slaughter house both mutton and hide become available for sale. Hence the marginal revenue associated with sale of a unit of the product package is the sum of the marginal revenues.

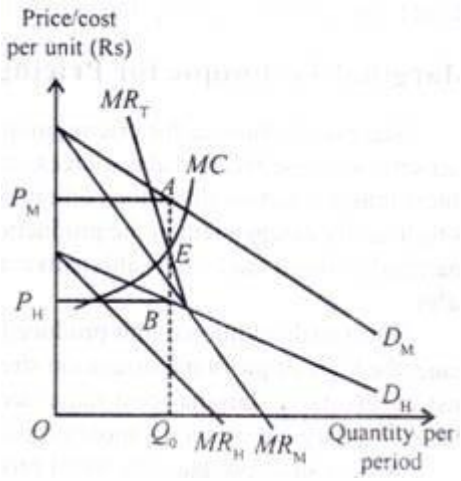


Figure: 64

This sum is represented by the line MR_T. MR_T is determined by adding MR_M and MR_T, for each rate of output. Graphically, it is the vertical sum of the marginal revenue curves of the two products. The profit maximizing output Q_O is determined by the intersection of MR_T and MC curve at point E with price of mutton OP_M and of hides OP_H.

(ii) Joint Products with Variable Proportions:

Pricing of joint products which can be produced with variable proportions presents interesting analysis of price, cost and output. When it is possible for a firm to produce joint products in different proportions, the total cost has to be divided among different products because there cannot be a being e marginal cost curve.

Figure: 65 illustrates the pricing method of multiple products with variable proportions wherein three main things are to be observed:

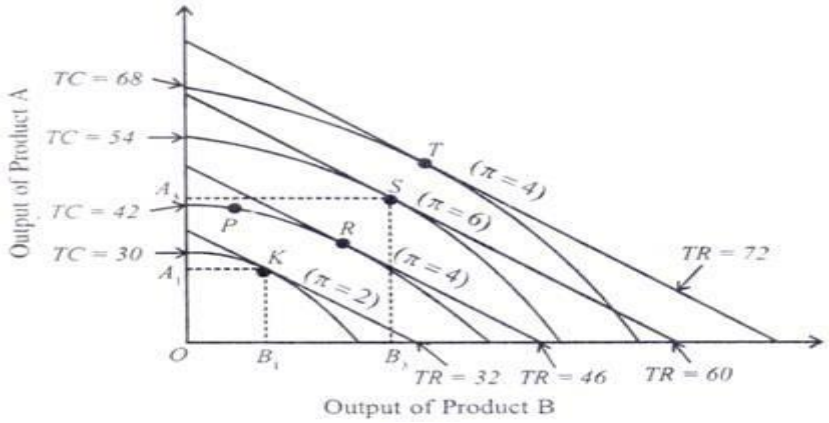


Figure: 65

(i) The production possibility curve is concave to the origin indicating imperfect adaptability of productive resources in producing products A and B. In other words, it indicates the quantity of A and B which can be produced with the same total cost. It is the is cost curve labelled as TC in the figure.

(ii) The iso-revenue lines define the prices which the firm receives for the two products irrespective of any combination of their output. They are shown as TR in the figure.
(iii) The best combinations are the points of tangency of isocost curves and iso-revenue lines tor optimum production and maximization of sales revenues or profits.
Thus, the optimal output combination is at a point where an iso-revenue line is tangent to an isocost curve. We can find the optimal combination by comparing the profit level at each tangency point and choosing the point with the highest profit level, given fixed product prices. Suppose a firm produces and sells two products A and B, given their prices. Each isocost curve, TC, shows the quantities of these products that can be produced at the same cost. Each iso-revenue line shows the combinations of outputs of A and B that yield the same revenue.
The problem facing the firm is to determine the outputs of joint products A and B. To solve it, let us start with an output combination where an iso-revenue line is not tangent to the iso-cost curve. Let us take such a point as P in the figure. This cannot be the optimal output combination because it is possible to increase revenue without changing cost by moving to point R on the same isocost curve where the iso-revenue line is tangent to the isocost curve.
Besides, the firm has to take into consideration the profit maximization optimal output of combination A and B products. For this, it compares the level of profit at each tangency point and chooses that point where the profit level is the highest. In the figure, there are four tangency points K , R ,S and T corresponding to the profit levels = Rs 2 crore, = Rs, 4 crore, = Rs 6 crore and = Rs 4 crore respectively.
It is clear from the above that the firm will choose the optimal output combination at point S where it produces and sells OA_3 units of product A and OB_3units of product B and earns the highest profit Rs. 6 crore. It cannot produce at the higher output combination point T as compared to S because its profit level will fall to Rs 4 crore.

3. Product-Line Pricing:

Product line pricing is an important practical problem for most modern industrial enterprises. Since almost every firm makes several related products, product line pricing is an important phase of price policy. Product line pricing refers to the determination of prices of the individual products which form units of an output package.
From the viewpoint of management, a typical modem firm produces multiple models, styles or sizes of output each of which can be considered a separate product. Although product line pricing requires same economic concepts used for single product pricing, the analysis becomes complicated, however, by demand and production externalities which arise because of substi-tutability or complementary between the products on the demand or the production side.
The problem of product line pricing is to find the proper relationship among the prices of members of a product group. Product line pricing can include use-differentials (e.g., fluid milk vs. cheese milk), seasonal differentials (e.g., morning movie specials) and style cycle differentials. These are all phases of product line pricing. Our analysis of product line pricing is divided into two parts, the first sets forth a general approach, to the problem¯, and the second applies this approach to some specific cases.

General Approach:

We discuss, in this section, problems of exploring demand relationships and competitive differences and of making and using cost estimates for pricing related products.

Alternative Policies of Price Relationship:

A logical approach to product line pricing is to start with a picture of the alternative kinds of policy regarding the relationships among prices of members of a product line.

Let us examine some systematic patterns below:

(i) Prices that are Proportional to Full Cost:

Prices that are proportional to full cost, i.e., that produce the same percentage net profit margin for all products. Here cost-plus pricing is followed.

(ii) Prices that are Proportional to Incremental Costs:

Prices that are proportional to incremental costs i.e., that produce the same percentage contribution margin over incremental costs for all products. Incremental cost is the additional cost of added units.

(iii) Prices with Profit Margins that are Proportional to Conversion Cost:

Prices with profit margins that are proportional to conversion cost, i.e., that take no account of purchased materials cost. Conversion costs refer to costs incurred to convert the raw materials into finished products.

(iv) Prices that produce Contribution Margins that depend upon the Elasticity of Demand:

Buyers with high incomes are usually less sensitive to price than those that make up the mass market and it is often profitable to put higher profit margins as products for the plushy class markets than for the rough and tumble mass markets.

(v) Prices that are systematically related to the Stage of Market and Competitive Development of Individual Members of the Product Line:

Many products pass through life cycles. A product line pricing policy that specifically recognizes that a company's various products is at different stages in their life cycles and hence face different market acceptance and competitive intensity has much to command it. This method emphasizes that the firm should charge high price for those products in the line which are in their pioneering stage and prices are kept low for products in the maturity stage.

Competitive Differences:

An analysis of competition is frequently a vital phase of product line pricing because differences of competitive selling among products call for differences in profit margins or distribution margins. Even though it is not possible to measure the relevant aspect of competitive differences among products. Differences in competitive condition depend upon the firm's share of each product in the market. Here two aspects of competition, existing and potential, have to be considered.

Existing competition can be measured indirectly by several of its symptoms:

(i) The number of competitors,
(ii) The market share, and
(iii) The degree of similarity of the competitive products.

In general, the fewer the competing sellers, the higher the margins, aside from other dimensions of competition. A product with a dominant market share can stand a higher mark-up since the presumption is that it has competitive superiority. The degree of similarity of the competitive product indicates that differentiated or unique products can have higher prices.

Potential competition can use indices like:

(i) Incentives for competitive entry,
(ii) Patent barriers,

(iii) Financial barriers, and
(iv) Technological barriers.
Existing profits of the firm are the index to the entry of other firms. Higher profits will attract other firms. Patent barriers to future competition depend upon the ability to initiate the production process. Financial barriers can be quantified by guessing how much money it would require to develop a competitive product and sell it. Technical barriers are similar to patent barriers.

Cost Estimates:

The cost should be the dominant if not the sole consideration in determining the relationship of prices within a product line. Cost estimates are indispensable for accurate analysis of almost every kind of pricing problem. Cost estimates are needed in product line pricing to project roughly the effects upon profits of different price structures.

Specific Problems:

Other dimensions that have to be considered in the philosophy of products line pricing are:

(i) Pricing products that differ in size
(ii) Pricing products that differ in quality
(iii) Charm prices
(iv) Pricing special designs
(v) Load factor price differentials
(vi) Pricing repair path
(vii) Pricing leases and licenses

They are explained as under:

(i) Pricing Product that differs in Size:

The intensity of competition often varies with size. The logical role for size as a pricing criterion is as a measure of value of the buyer. In selecting the pattern of relationship of price to size, much depends upon whether the typical buyer has freedom to substitute one size of product for another. The best example of size-differential pricing problems is given with reference to fractional page advertising rate in newspapers.

(ii) Pricing Products that differ in Quality:

The pricing decision here depends primarily upon the strategic objectives of having products that differ in quality. Sometimes the purpose of high-quality items is to bring prestige to the entire line. The firm may also produce products of lower quality to compete with the low-priced product in the market. The low-quality products are introduced at low prices to face competition.

(iii) Charm Prices:

Charm price theory is based upon consumer psychology that prices ending in odd figures e.g. Rs. 4.95 and Rs. 9.95 have greater effect than odd or even prices such as Rs. 5 and Rs.10. This is a point of controversy and empirical research, yet it does not permit a conclusive answer. Newspaper advertisements are dominated by prices ending in odd numbers. Another explanation is that odd figures convey the notion of a discount or bargain.

(vi) Pricing Special Designs:

Pricing special designs is a common practice to estimate normal full cost, then add to cost a fixed percentage to represent a fair or desirable profit. The price decision as special order is really a decision as to whether or not to produce the product at all. Here cost plays a peculiar

role in special order pricing. An important base for special order pricing is good judge men estimating accurately the future cost of unfamiliar products.

(v) Load Factor Price Differentials:

Here firms charging different prices at different times the same product or service in order to improve the sellers' load factor have important profit potentiates for many producers. Such load factor price differentials are part of peak load pricing theory.

Examples of load factor price differentials are off peak rates for electric energy, morning movies, summer discounts on winter clothing, etc. It need not be for the same product at different period. Analysis of demand, cost and competition should enter into this consideration.

(vi) Pricing Repair Parts:

All producers of durable goods face the problems of pricing the repair parts or spare parts. Some firms even experience higher sales receipts from repair parts production than from new equipment. Spare parts pricing has an element of monopoly. This monopoly power is however always restricted by competition of various forms.

Pricing of spare parts should not be related to relative average cost or to relative weight. Parts that are readily available should be sold at relatively low prices. Parts that the buyer can himself rebuild or get it made, for them prices should be low.

(vii) Pricing Leases and Licenses:

Royalty licensing and leasing of capital goods and patents reflect application of market segmentation pricing. Uniform price cannot be charged. The price charged on these is closely related to the benefits the firm receives. This pricing practice reaps for the seller-a share of the gains of the most advantageous users.

Benefits are determined by the purpose for which the equipment is obtained, the rate of utilization, the efficiency of alternatives and so forth. As far as royalty price is concerned, it need not consider the development costs that were incurred in creating the equipment.

4. Pricing over the Life Cycle of a Product:

The cycle begins with the invention of the new product. The innovation of a new product and its degeneration to a common product is termed as the life cycle of a product. It is an important concept m marketing that provides insights into a product's competitive dynamics. The life cycle of a product portrays distinct stages in the sales history of a product.

Corresponding to these stages are distinct opportunities and problems with respect to market strategy and profit potential. By identifying the stag that a product is in, or may be headed toward, companies can formulate better marketing plans. Figure 66 depicts the life cycle of a product.

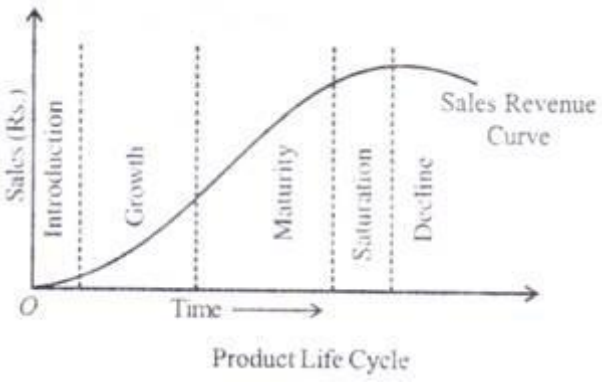


Figure: 66

Every product moves through a life cycle having five phases as shown in the figure and they are:

(i) Introduction:

This is the first stage in the life cycle of a product. This is an infant stage. The product is a new one. The product is put on the market, awareness and acceptance are minimal. There are high promotional costs. Therefore, the profit may be low. The firm can use two types of pricing policy, i.e., skimming price policy or centralizing price policy in this stage.

(ii) Growth:

In this stage, a product gains acceptance on the part of consumers and businessmen. The product begins to make rapid sales gains because of the cumulative effects of introductory promotion, distribution work or mouth influence. The product satisfies the market. For the purpose of pricing, there is not much difference between growth and maturity stages.'

(iii) Maturity:

At this stage, keen competition increases. Sales growth continues, but at a diminishing rate, because of the declining number of potential customers. Competitors go for mark-down price. Additional expenses are involved in the product's modification and improvement, thus profit margin slips. This period is useful because it gives out signals for taking precaution in pricing policy.

(iv) Saturation:

In this stage, the sales are at the peak and further increase is not possible. The demand for the product is stable. The rise and fall of sale depend upon supply and demand. There is little additional demand to be stimulated, it happens to be its replacement demand. Therefore, the product pricing in the saturation stage is full cost plus normal mark-up.

(v) Decline:

Sales begin to diminish absolutely as the customers begin to tire of a product. The competitors have entered the market with substitutes and imitations. Price becomes the competitive weapon. The product should be reformulated to suit the consumers preferences, it is possible in the case of few commodities.

Throughout the cycle, changes take place in price and promotional elasticity of demand as also in the production and distribution costs of the product. Therefore, pricing policy must be adjusted over the various phases of the cycle.

5. Cyclical Pricing:

Cyclical pricing refers to the pricing decisions of the firm which are taken to suit the fluctuations in the business conditions. To simplify decision making in response to the alterations in the entire economic system, it is necessary for the firm to have some kind of policy based on cyclical price behaviour. It is more apparent to say that prices are slashed during recession and pegged up during a demand-pull or a demand-push.

In formulating a policy of cyclical pricing, various factors such as demand, competition, cost-push, price rigidity, price fluctuations, fluctuations due to substitutes, purchasing power, market share and demand fluctuation should be taken into account.

They are explained as under:

(i) Demand:

The commodities are divided into durable and non-durable goods. The necessaries fall under non-durable goods and demand for them is constant and inelastic. The purchase of necessary

goods cannot be postponed but the purchase of durable goods can, however, be postponed. Under imperfect market conditions, demand plays an important role.

(ii) Competition:

If the market is imperfect, firms compete against each other and there is an element of interdependence. A policy change on the part of one firm will have immediate effects on competitors. Price cuts lead to price war. Therefore, adjustments have to be made.

(iii) Cost-push:

Producers tend to pass on increase in cost of production to consumers in the form of higher prices.

This may happen due to:

(a) Wage increases higher than output;
(b) Inadequate investment in plant may reduce output;
(c) Shortages of factors of production; and
(d) Increase in price of basic raw materials.

In these conditions' costs are bound to rise. Under this situation, what kind of pricing policy should be followed by the firms? It is difficult to answer this question.

Joel Dean suggests that in formulating a policy of cyclical prices, the following factors may be considered:

(a) Price Rigidity:

Firms do not believe that prices change because of business cycles. The cyclical fluctuations are caused by economic factors like income, profit and psychological factors like expectations of the consumers. They have control over these factors. They are also of the opinion that it is not healthy to change prices in response to cyclical fluctuations.

(b) Price Fluctuation:

Price fluctuations conform to cost changes at current full cost, standard full cost, and incremental cost. Confirming cyclical changes in prices to changes in company costs is another popular cyclical policy. It amounts to stabilizing some sort of unit profit margin.

(c) Fluctuation due to Substitutes:

The use of substitute product as a cyclical pricing guide is an appropriate price policy in many situations. It may also stabilize the industry's share of the vast substitute market.

(d) Purchasing Power:

If prices can be reduced because of a fall in the purchasing power of the people during a depression, then we have what is known as the blanket index of the purchasing power. Purchasing power index is only an average that covers up great disparities. Therefore component prices are more important.

(e) Market Share:

Market share is determined by many factors and price is an important determinant. Price policy has a profound effect upon the larger share of the substitute market. A reduction in price would increase the market share. Market share can be a useful pricing guide for cyclical pricing.

(f) Demand Fluctuations:

If there are shifts in demand, they should be taken into account in setting prices. They are more important than the elasticity of demand. One recession pricing policy is to change prices in relationship to some appropriate index of shifts in demand for the product.

This pricing method assumes:
(i) That flexible rather than rigid prices are appropriate,
(ii) That changes in prices in the past have adjusted for changes in demand correctly,
(iii) That these past pricing objectives are today's objectives, and
(iv) That cost behaviour and competitive reactions will be the same as in similar periods in the past.

6. Transfer Pricing:
Transfer pricing is one of the most complex problems in pricing. The growth of large scale multi- divisional organizations has given rise to the problem of pricing commodities that are transferred internally from one division to another.

The divisional organizations are preferred due to the following reasons:
(i) It provides a systematic way of delegation and decision making
(ii) For proper evaluation of contribution, and
(iii) For the precise evaluation of manager's performance.

This involves the problem of sub-optimization. The transfer price must satisfy the following two criteria:
(i) It should help establish the profitability of each division or department.
(ii) It should permit and encourage maximization of the profits of the company as a whole.

For determining the transfer price there are three alternative methods. They are explained as follows:

(i) Market Price Basis:
The suitable system of transfer of goods from one division to another under the same management to another company is the market price basis. The market price should be the transfer price. Wherever a market price exists for a product, the inter-divisional transfer price should equal the market price to avoid sub-optimization. This method definitely avoids the possibility of passing the inefficiencies of one department to the other departments.

(ii) Cost Basis:
In case the product produced by a division of the firm can be sold only to another division of the firm, the inter-divisional transfer should be priced at the level of the actual cost of production. Here transfer prices will be useful to achieve the best joint level of output. It will maximise profits.

(iii) Cost plus Basis:
Under this method the goods and services of each department are charged on the basis of actual cost plus a margin by way of profit. The major defect of this method is that the transferring department may add a high margin so as to raise the profit of the department. It may result in setting the ultimate price unduly high thereby affecting sales.

- **Transfer Price Determination:**

Objectives:

Firms have the following objectives while determining the transfer price:
1. The aim of the firm is to ensure that its goal coincides with that of the related divisions.
2. The price of the transferred product should be so determined that the profitability of each division could be ensured.
3. The price should be such that it could induce profit-maximization of the company as a whole rather than of a particular division.

Large firms often divide their operations into various divisions or departments. One division uses the product of the other division. In such a situation, firms are faced with the problem of determining an appropriate price for the product transferred from one division or sub-division to the other.

In other words, transfer pricing refers to the price determination of goods and services transferred among interdependent units or divisions within the organization. This operates as a measure of the economic achievements of profit-making divisions in the organization. It is necessary to consider various situations while determining transfer price.

1. Transfer Pricing: Absence of an External Market:

If an intermediate product has no external market, transfer pricing will be according to the marginal cost of the producer. Suppose that a firm has two independent divisions: production division and marketing division. The Production division produces one product that is sold to the marketing division of the same firm.

The price at which it sells is called transfer price. Further, the marketing division presents that product as a final product by packaging it and sells it to the public. We also assume that the product manufactured by the production division has no market outside the firm.

In other words, the marketing division completely depends upon the production division for the supply of the product and the production division depends on the marketing division for its demand. Therefore, the total quantity of the product manufactured by the production division must be equal to the amount sold by the marketing division.

In Fig. 6 MC_P and MC_M are the cost curves of production division and marketing division respectively and MC is the firm's cost curve. This curve is the summation of MC_p and MC_Mcurve D_F is the firm's demand curve and MR is the marginal revenue curve for the final product. The firm will be in equilibrium at point E where its MC curve cuts its MR curve. The firm will be selling OQ quantity of the product at OP price.

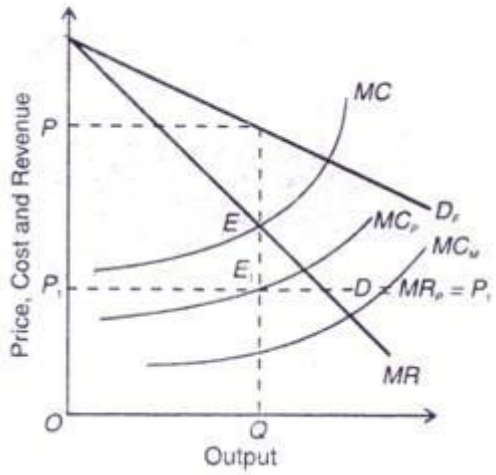


Figure- 67

Now, the question is how much price the production division should charge for its product from the marketing division? The transfer price is equal to the marginal revenue of the production division. The transfer price once determined is always stable because the demand curve of production division is horizontal on which the marginal revenue of production division is equal to the transfer price, i.e., $D=MR_p$—P_1. The production division will earn the maximum

profit for its intermediate product at that point where Price (P_1) which is also its marginal revenue (MR_p), is equal to its marginal cost (MC_p), i e P_1= MR_p =MC_p. This situation is at point where the MC_p curve cuts the. D=MR_p=P_1 curve from below.

2. Transfer Pricing: Presence of an External Market:

If there is an external market for the intermediate product, the production division may produce more product than the marketing division needs and may sell the surplus product in the external mare. On the other hand, it may produce less than the needs of the marketing division and the market division can obtain the rest of its requirements from the external market. Thus, it is more free for maximizing its profit.

(1) Transfer pricing: In a Perfectly Competitive External Market:

In the case of a perfectly competitive external market, where the intermediate product can be sold or bought from the perfectly competitive outside market by the firm, the quantity produced by the production division may not be equal to the required quantity for the marketing division. In such a situation transfer price of intermediate product is the market price of that product. The firm can be in the maximum profit situation only when all its divisions operate at their related MR — MC points. In these conditions, we explain transfer pricing in terms of Figure

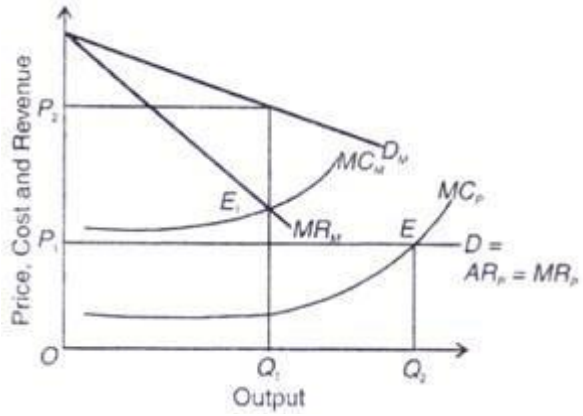


Figure- 68

In the figure, D is the demand curve of intermediate product which is a horizontal line. This curve shows marginal revenue (MR_p), average revenue (AR_p) and price (P) of the production division. According to the figure, the production division will receive the maximum profit at OQ_2 output level because at this level marginal cost of production (MC_p) is equal to its marginal revenue (MR_p) which determines OP_1 price. Here the equilibrium is at point E where the MC_p curve cuts die D=AR_p = MR_p curve from below.

To maximize total profit of the firm in the perfectly competitive market, it will be appropriate to keep transfer price at OP_1 level. It is at this price that the production division will sell its intermediate product to the marketing division or to outside customers, and the marketing division will also give only OP_1 price for the intermediate product to the production division.

The marginal cost curve of the marketing division is MC_M which is the summation of marginal marketing cost and transfer price P_1. To maximize its profit, marketing division will have to purchase OQ_1 quantity where its marginal cost MC_M is equal to its marginal revenue MR_M at point In the figure, the maximum profitable quantity for the production division will be OQ_2 and that for the' marketing division OQ_1 Hence, the production division will sell OQ_2– OQ_1 = Q_2Q_1 portion of its output in the external market.

(2) Transfer Pricing:

In Imperfectly Competitive External Market, here we discuss transfer pricing in that market situation where the production division sells its product in imperfectly competitive external market as well as to the marketing division. In such a situation, an important problem of price differentiation arises in different markets.

The production division will get the maximum profit, when the marginal revenue in each market is equal to marginal revenue for the total market, and total market marginal revenue is equal to marginal cost. In other words, transfer price for the marketing division should be equal to the marginal cost of production division. Transfer price determination in the case of imperfectly competitive external market is shown is Fig.69.

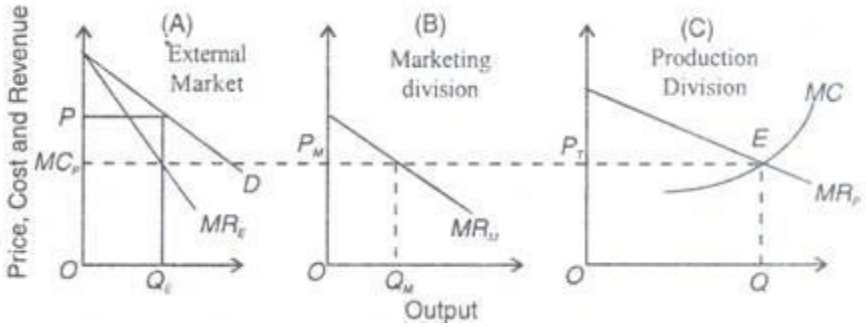


Figure- 69

Panel (A) of the figure is related to an imperfectly competitive external market in which D is its demand curve and MR_E is its marginal revenue curve. Panel (B) is related to the marketing division in which MR_M is the net marginal revenue curve of the marketing division. In other words, $MR_M = (P_T = MC_p)$. Here, transfer price (P_T) is equal to the marginal cost of the production division (MC_p) Panel (C) is related to the production division.

Its marginal revenue curve MR_p is the summation of marginal revenue of the marketing division within the firm (MR_M) and marginal revenue of the external market (MR_E). The optimum production level of the production division is OQ when MR_p curve is equal to MC curve at point E and the transfer price is OP_T. The marketing division wall buy OQ_M quantity of output at OP_T transfer price from the production division and the production division can sell OQ_E units of its production at OP price in the external market.

7. Differential Pricing:

Differential pricing is a method that is used by some sellers to tailor their prices to the specific situation of buyers. The firm may charge the same or different prices for the same product. It is a practical device available to management to enlarge profits. It exploits the difference in demand elasticities.

The most common ones include quantity differentials, location differentials, product use differentials and time differentials. To achieve differential pricing, it is necessary to segment markets. The common techniques utilized for market segmentation are differences in product design, quality, choice of channel, time of sale, patents, packaging and advertising.

The important reasons for the price differentials are the following:
(i) The location of purchase,
(ii) The amount of purchase,
(iii) The time of purchase,
(iv) The status of the buyer,
(v) The promptness of payment, and
(vi) The personal situation.

The major goals of price differentials are the following:
(i) Implementation of different market strategy,
(ii) To achieve profitable market segmentation,
(iii) To attract new customers,
(iv) To face competition, and
(v) To solve production problem.

(A) Distributor Discounts:

The differential prices often take the form of price discount. Modern business extends over a very wide area. The whole market may be divided into different areas or regions, thereby trade channel is formed. The manufacturer puts his product in the trade channel through various intermediaries or distributors. He allows certain rate of discount to the distributors. Such discounts are called distributor discounts. They refer to discounts or price deductions allowed to various distributors in the channel.

- **Factors Determining Distributor's Discounts:**

Discounts given to distributors will depend on the following:

(i) Services of the Distributor:

The role played by the distributor is different for each product. In general, the merchandise business distributor himself will have to decide the investment and there is any sort of help from the manufacturer. On the other hand, the people who run specialized business like electronic gadgets have to devote themselves exclusively to the products of only one firm. The distributor discount is generally at a low and fixed level and for the specialized distributors, the discounts are normally high.

(ii) Operating Cost of the Distributor:

The aim of allowing discounts to the distributor is to cover the operating costs and normal profits of distributors. The operating costs depend upon the various functions they perform. The producer himself may take up the function of a distributor and thus assess the cost. This may provide a basis for assessing the operating cost.

(iii) Discount Structure of Competitors:

Many close substitutes are available in a competitive market. Different manufacturers will be providing different discount rates. The discounts given by rival sellers are very practical guide.

(iv) Effect of Discounts on Ultimate Buyers.

A producer must take into account the effect of discount allowed to a distributor on the ultimate buyers. He should watch whether the distributor attempts to expand sales or not. Some distributors may forego a part of their discounts by disposing of the product below the list price.

(v) Effect of Distributor Population:
The manufacturers must adopt an attractive discount policy expand the distributor population quickly. A manufacturer must also take into account whether he wants to have a wide network of small distributors or only a few big distributors

(vi) Cost of Selling to Different Channels:
The cost of distributing the commodity to different channels of distribution is yet another criterion. In certain cases, the distributor will receive the orders and pass on to the manufacturer. In mail order channels, the rate of discount is low. Apart from this the distance, local taxes, and mode of transport engaged may also cause variations in the cost of distribution.

(vii) Opportunities for Market Segmentation:
In some cases, the market is sub-divided into several sub-markets. The sub-market may have its own demand and competitive characteristics. These markets are characterised by variation in the elasticity of aggregate demand and cross demand.

(B) Quantity Discounts:
Quantity discounts relate to the quantity purchased. These are important pricing tools for most modem firms.

There are two main considerations involved in this:
(i) The type of discount system to be chosen, and
(ii) The size of quantity discount to be allowed.

For the type of discount system to be chosen, certain guidelines have to be adopted. The important guidelines have to be based on:
(i) The way the size is measured
(ii) On the measurement of the quantity of individual product
(iii) The form of calculation
(iv) The number of transactions.

The size of quantity discount to be allowed involves two considerations:
(i) Specific market objectives; and
(ii) Legality of the discount.

(i) Under specific market objectives, quantity discounts can help to induce the customers to give t e seller bigger lots. They can stimulate the same customers to give the seller a larger share of their total business. It is to overcome competition through hidden price reduction.

(ii) Under legality of the quantity discount, all quantity discounts are discriminatory and applied to suppress competition. The question of legality arises when quantity discount tends to suppress competition.

(C) Cash Discounts:
Cash discounts are reduction in the price which depend upon promptness of payment. It relates to cash sales. Cash discounts are allowed by the producers to dealers and dealers to customers. The cash discount is a convenient way to identify bad credit risks. If a buyer wants to buy on credit, he may have to forego discount. By discouraging customers from credit buying, the producer is able to reduce the working capital.

(D) Geographical Price Differentials:
It is another commonly practiced differential pricing. This is based on buyer's location. It revolves round the nature of transportation cost and certain legal considerations.

They take a variety of forms:

(i) F O.B. Factory Pricing:

Under FOB pricing, the buyer is required to bear the entire cost of transport and is responsible for the risks occurring during transport except those are assumed by the carrier. Since the product is priced at the seller's plant, the buyers can choose the method often transportation. It assures uniform net price on all shipments regardless of where they go. The seller responsible for delay in carriage and no risk is assured by the seller.

(ii) Postage Stamp Pricing:

Postage stamp pricing means charging the same delivered price or all destinations irrespective of buyer's location. The price naturally includes the estimated average transport cost. It is most commonly employed for goods of popular brands and having nationwide distribution. This pricing gives a manufacturer access to all markets regard- less of his location.

(iii) Zone Pricing:

Under zone pricing, the seller divides the country into zones and regions and charges the same delivered price within each zone, but different prices between different zones. I is preferred where transport cost on goods is too high to permit, the sale, though cost on goods is too high

(iv) Basic Point Pricing:

A basic point price consists of a factory price plus transportation charges calculated with reference to a particular basic point! Under the system, the delivered price may be computed by using either single basic point or multiple basic points. If the delivered price is computed by using a single basic point it is called single basic point pricing. If more than one basic points are selected for pricing, it becomes multiple basic pricing.

8. Cost-Plus or Full-Cost Pricing:

Cost-plus is a short cut method in pricing a product. It means the addition of a certain percentage of the costs as profits to the cost of production to arrive at the price. This is known as a this is precisely cost-plus pricing. This method suggests that the price of a product should cover f cost and generate the returns as investments at a fixed mark-up percentage.

Full cost is full average cost which includes average direct costs (AVC) plus average overhead costs (AFC) plus a normal margin for profit:

p = AVC + AFC + profit margin or mark-up.

Thus, of the two elements of cost-plus price, one is the cost and the other one is mark-up. These two components are separately analyzed.

Cost is an important factor in determining price. The cost is the base on which is grounded the percentage of profit. Costs carry main influence on price and are long-term price determinants are different methods of computing the cost.

Broadly speaking, there are three methods of computing the cost:

(i) The actual cost,

(ii) The expected cost, and

(iii) The standard method of costing.

The actual costs are those which are actually incurred on the production of an item. It includes the wage rate, material cost and overhead expenses.

The expected cost is a forecast of the actual expenses for the pricing period. Suppose a product is planned to be introduced in the market, say three months from today, the firm first arrives at the cost of producing one unit at current prices. Then the prices of various components are projected for the next three months to arrive at the expected cost.

Under the standard method of costing, the capacity of the plant is taken into account. For example, the plant may be present by running at 70 per cent capacity. It may be that when it runs at 90 per cent, the cost may be normal or optimum. This is a factor that will have to be taken into account.

The second aspect is the percentage mark-up. In determining appropriate mark-up, the firm should carefully evaluate cost, demand elasticity and degree of competition faced by the product. The firm should also take into account the brand image and long run strategy in fixing mark-up. Once the markup is fixed, it should be added to the cost of a product.

Cost-plus pricing can be classified into two categories on the basis of mark-up and they are (i) rigid cost-plus, and (ii) flexible cost-plus.

Rigid Cost-Plus Price:

In rigid cost-plus pricing, it is customary to add a fixed percentage to the cost to get price. Only variable costs are taken and a fixed mark-up percentage is added to it. This method is simple to calculate and is consistent with profit motive.

Flexible Cost-Plus Pricing:

In flexible cost-plus pricing, mark-up is not rigidly fixed as cost but it is allocated on different heads of variable and fixed costs. It considers all aspects of costs, viz., labour, material, machine hours and all overheads.

Hall and Hitch suggest the following reasons for the firm to observe full cost-pricing:

(i) Consideration of fairness,
(ii) Ignorance of demand,
(iii) Ignorance of potential reaction of competitors,
(iv) The belief that the short-run elasticity of market demand is low,
(v) The belief that increased prices would encourage new entrants, and
(vi) Administrative difficulties of a more flexible price policy.

- **Mark-up and Turn over:**

Mark-up may have direct link with turnover. High turnover items may carry low mark-up. This is due to the following reasons:

(i) Customers are aware of the prices of such items and would shift to other source of supply, and
(ii) For high turnover goods, storing space is a big problem and opportunity cost of space utilization and inventory buildup should be taken into account.

Mark-up and Rate of Return:

There is another way of arriving at the price which is known as the rate of return pricing. In cost- plus pricing the question of mark-up poses a problem. To by pass this problem, the rate of return pricing method may be followed. Under this method, the price is determined by the planned rate of return on the investment which is expected to be converted into a percentage of mark-up.

For fixing rate of return mark-up on cost, three steps are necessary:

(i) To estimate the normal rate of production and the total cost of a year's normal production over a cycle,
(ii) To calculate the ratio of invested capital to a year's standard cost, and
(iii) To modify the capital, turn over by rate of return. This gives us on the mark-up percentage.

➢ **Determination of Cost-Plus Price:**

The determination of cost-plus price is explained below in terms of Prof. Andrews's version. Prof. Andrews in his study, Manufacturing Business, 1949, explains how a manufacturing firm actually fixes the selling price of its product on the basis of the full-cost or average cost.

The firm finds out the average direct costs (AVC) by dividing the current total costs by current total output. These are the average variable costs which are assumed to be constant over a wide range of output. In other words, the AVC curve is a straight line parallel to the output axis over a part of its length if the prices of direct cost factors are given.

The price which a firm will normally quote for a particular product will equal the estimated average direct costs of production plus a costing-margin or mark-up. The costing-margin will normally tend to cover the costs of the indirect factors of production (inputs) and provide a normal level of net profit, looking at the industry as a whole.

The usual formula for costing-margin (or mark-up) is,

M = P-AVC/AVC ….(1)

where M is mark-up, P is price and AVC is the average variable cost and the numerator P-AVC is the profit margin.

If the cost of a book is Rs 100 and its price is Rs 125,

M = 125-100/100 = 0.25 or 25%

If we solve equation (1) for price, the result is

P=AVC (1+M) ….(2)

The firm would set the price,

P=Rs 100 (1+0.25) =Rs125.

Once this price is chosen by the firm, the costing-margin will remain constant, given its organization, whatever the level of its output. But it will tend to change with any general permanent changes in the prices of the indirect factors of production.

Depending upon the firm's capacity and given the prices of the direct factors of production (i.e., wages and raw materials), price will tend to remain unchanged, whatever the level of output. At that price, the firm will have a more or less clearly defined market and will sell the amount which its customers demand from it.

But how is the level of output determined? It is determined in either of the three ways:

(a) As a percentage of capacity output; or (b) as the output sold in the preceding production period; or (c) as the minimum or average output that the firm expects to sell in the future. If the firm is a new one, or if it is an existing firm introducing a new product, then only the first and third of these interpretations will be relevant. In these circumstances, indeed, it is likely that the first will coincide roughly with the third, for the capacity of the plant will depend on the expected future sales.

The Andrews version of full-cost pricing is illustrated in Figure 9 where AC is the average variable or direct costs curve which is shown as a horizontal straight line over a wide range of output. MC is its corresponding marginal cost curve. Suppose the firm chooses OQ level of output.

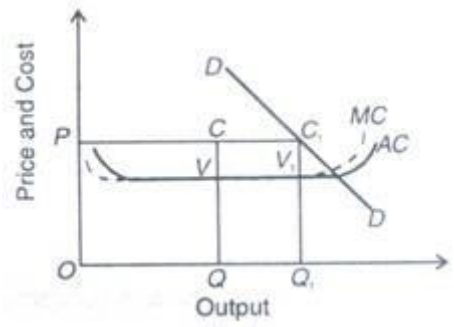


Figure-70

At this level of output, QC is the full-cost of the firm made up of average direct cost QV plus the costing-margin VC. Its selling price OP will, therefore, equal QC. The firm will continue to charge the same price OP but it might sell more depending upon the demand for its product, as represented by the curve DD. In this situation, it will sell OQ_1 output.

"This price will not be altered in response to changes in demand, but only in response to changes in the prices of the direct and indirect factors."

- **Advantages:**

The main advantages of cost-plus pricing are:

1. When costs are sufficiently stable for long periods, there is price stability which is both cheaper administratively and less irritating to retailers and customers.
2. The cost-plus formula is simple and easy to calculate.
3. The cost-plus method offers a guarantee against loss-making by a firm. If it finds that costs are rising, it can take appropriate steps by variations in output and price.
4. When the firm is unable to forecast the demand for its product, the cost-plus method can be used.
5. When it is not possible to gather market information for the product or it is expensive, cost-plus pricing is an appropriate method.
6. Cost-plus pricing is suitable in such cases where the nature and extent of competition is unpredictable.

- **Criticisms:**

The cost-plus pricing theory has been criticized on the following grounds:

1. This method is based on costs and ignores the demand of the product which is an important variable in pricing.
2. It is not possible to accurately ascertain total costs in all cases.
3. This pricing method seems naive because it does not explicitly take into account the elasticity of demand. In fact, where the price elasticity of demand of a product is low, the cost-plus price may be too low, and vice versa.
4. If fixed costs of a firm form a large proportion of its total cost, a circular relationship may arise in which the price would rise in a falling market and fall in an expanding market. This happens because average fixed cost per unit of output is low when output is large and when output is small, average fixed cost per unit of output is low.
5. Cost-plus pricing method is based on accounting data for total cost and not the opportunity cost that the sale of product incurs.

6. This method cannot be used for price determination of perishable goods because it relates to long period.
7. The full-cost pricing theory is criticized for its adherence to a rigid price. Finns often lower the price to clear their stocks during a recession. They also raise the price when costs rise during a boom. Therefore, firms often follow an independent price policy rather than a rigid price policy.
8. Moreover, the term 'profit margin' or 'costing margin' is vague. The theory does not clarify how this costing margin is determined and charged in the full cost by a firm. The firm may charge more or less as the just profit margin depending on its cost and demand conditions. As pointed out by Hawkins, "The bulk of the evidence suggests that the size of the 'plus' margin varies it grows in boom times and it varies with elasticity of demand and barriers to entry."
9. Empirical studies in England and the U.S. on the pricing process of industries reveal that the exact methods followed by firms do not adhere strictly to the full-cost principle. The calculation of both the average cost and the margin is a much less mechanical process than is usually thought. As a matter of fact, businessmen are reluctant to tell economists how they calculated prices and to discuss their relations with rival firms so as not to endanger their long-run profits or to avoid government intervention and maintain good public image.
10. Prof. Earley's study of the 110 'excellently managed companies' in the U.S. does not support the principle of full-cost pricing. Earley found a widespread distrust of full-cost principle among these firms. He reported that the firms followed marginal accounting and costing principles, and the majority of them followed pricing, marketing and new product policies.