M.A. ECONOMICS
Second Year

PAPER No. 7

INDUSTRIAL ECONOMICS

SCHOOL OF DISTANCE EDUCATION
BHARATHIAR UNIVERSITY,
COIMBATORE – 641 046.

CONTENTS

UNIT I
I.FIRM AND INDUSTRY

1.1.1 Introduction:

Industrial economics is a branch of economics which deals with the economic problems of firms and industries, and their relationship with the society. There are two elements of industrial economics.

1. Descriptive Element:

It is concerned with the information content of the subject.

2. Business Policy and Decision Making:

It is concerned with the business policy and decision making.

The above two elements are interdependent in nature.

Learning Objectives:

After studying this unit, you should be able

- To define firm.
- To explain industry.
- To distinguish between firm and industry.
- To list out the classification of industry
- To state the primary industry
- To explain the secondary industry

1.1.2 Meaning of the Firm and Industry:

Firm:

A firm refers to a unit which owns controls and manages the plant. If an individual or a partnership organisation or a company owns one or more mills or factories or in other words plants, the individual or the partnership organisation or the company which ever may be the case should from the financial and administrative point of view be regarded as a 'firm' a single industrial unit.

Industry:

A group of firm either producing similar products or using similar raw material is called industry e.g., cement, sugar industry etc. Sugar Industry means all firms producing sugar and all firms, using sugar cane as raw material. Industry is therefore, termed as a group of sellers or close substitute output who supply to a common group of buyers".

What is Industry?

Industry means a place where goods are manufactured. Industry includes all those firms or units which are engaged in the manufacturer of goods or components of similar nature or which uses the similar raw materials. Industry thus covers such activities which are connected with raising or producing or processing goods.

Classification of Industry :

On the basis of the nature activity industry can be classified into various categories (see chart 1)

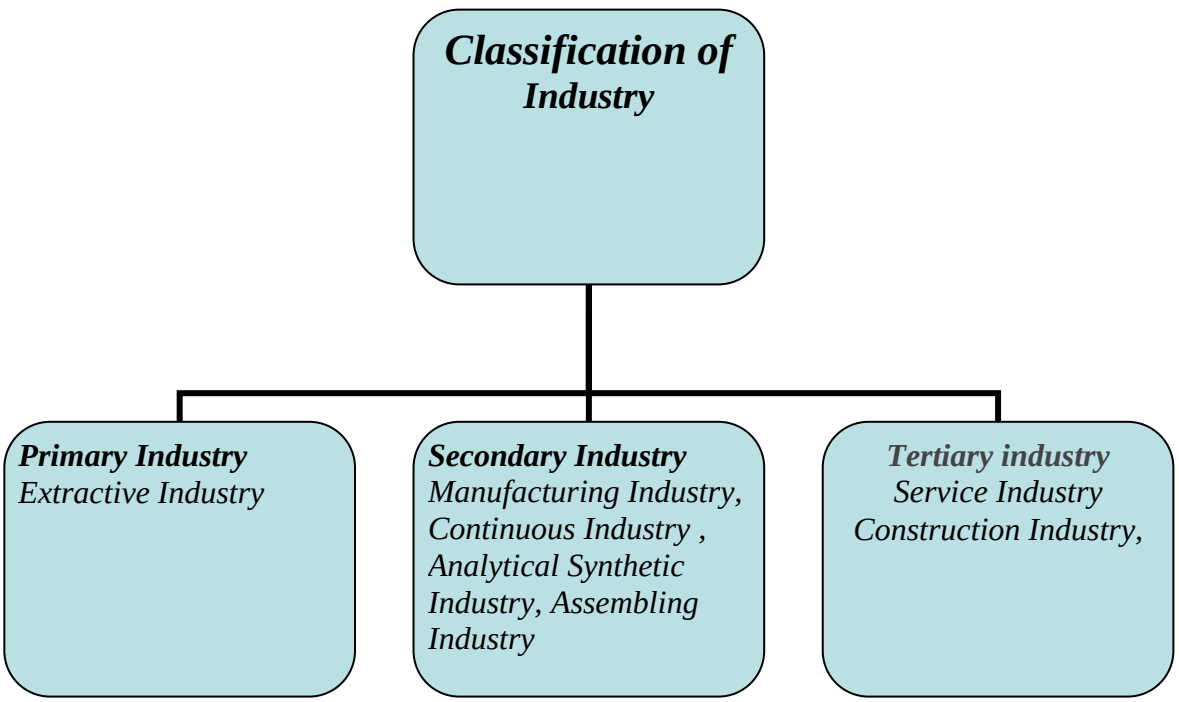


Chart 1

1.Primary Industry :

Primary industries are those that harvest or extract raw material from nature, such as agriculture, oil and gas extraction, logging and forestry, mining, fishing, and trapping.

Primary Industry goods are obtained from the earth, sea and nature. Primary industry comprises of extractive industry and genetic industries. Extractive industries are those which are primarily engaged in obtaining commodities either from inside the earth or from the bottom of the sea. Mining of coals, iron ore, crude oil etc. and cutting of trees, hunting of animals, catching of fishes etc are included in Extractive Industries.

In case of genetic Industry it refers to such activities which are basically dependent on nature. In such industries greater amount of manual work is required, land, water, air are the main sources of genetic industry. Production and productivity depend on the application of human skill and knowledge. Forestry, cattle rearing, dairy farming belongs to the group of industry.

2. Secondary Industry:

Secondary industries goods are manufactured with the help of resources available in nature by changing their form. Manufacturing, construction and service industry belong to this category.

Under manufacturing industry, raw material and semi-finished materials are the base of manufacturing industries. Examples include iron and steel plants, flour mills etc. The industry consists of four categories:

(a) **Continuous Industry**: In continuous industry, raw materials are turned into finished goods through one or more process. For example, sugar is obtained by processing sugarcane and cotton clothe through processing cotton.

(b) **Analytical Industries**: Analytical Industries are those in which the basic material is analysed and separated into several parts in order to obtain different finished products. For example, crude oil is analysed, separated into petrol, diesel oil, lubricating oil etc. To get different products from one raw material, different processes are undertaken.

(c) **Synthetic Industries**: Those industries under which various components or materials are brought together and are combined in the process of manufacture and thereafter quite different finished products are obtained. Thus, for one finished products more than one materials are used. Cement manufacturing, soap making etc are examples of such industries.

(d) **Assembling Industries**: Those industries under which different materials or components are brought together and after proper assembling finished products are obtained. Automobiles industry, bicycle industry, fan industry etc examples of assembling industry.

3. Tertiary industry:

Tertiary industry consists of construction and service industry. Under construction industry work is done at one place, construction products are not taken away to market for sale. Construction of building, roads, bridges etc are examples of this industry while in service industry it does not produce physical products, its products are non-physical in nature and are intangible, inseparable, perishable, and variable in nature. For e.g., Services provided by hotels, hospitals, banks, insurance companies etc the examples of services industry.

Service industry includes industries that, while producing no tangible goods, provide services or intangible gains or generate wealth. In free market and mixed economies this sector generally has a mix of private and government enterprise.

The industries of this sector include banking, finance, insurance, investment, and real estate services; wholesale, retail, and resale trade; transportation, information and communications services; professional, consulting, legal, and personal services; tourism, hotels, restaurants, and entertainment; repair and maintenance services; education and teaching; and health, social welfare, administrative, police, security, and defense services.

Model questions:

1. What do you mean by firm?
2. Define industry.
3. Distinguish between firm and industry.
4. List out the classification of industry.
5. State the primary industry.
6. Distinguish between primary and secondary industry.
7. Write a note on continuous industry
8. Explain the Synthetic Industries.
9. Write a note on Analytical Industries.
10. What do you mean by Assembling Industries**?**

LESSON 2

1.2 Industrial Efficiency: Concepts and Measurement

1.2.1 Definition of 'Efficiency':

A level of performance that describes a process that uses the lowest amount of inputs to create the greatest amount of outputs. Efficiency relates to the use of all inputs in producing any given output, including personnel time and energy.

Efficiency is an important attribute because all inputs are scarce. Time, money and raw materials are limited, so it makes sense to try to conserve them while maintaining an acceptable level of output or a general production level. Being efficient simply means reducing the amount of wasted inputs.

1.2.2 Meaning of the Concept:

The core of any economic activity, whether it is consumption or production or anything else, is to strive for the maximum possible efficiency. The term ‘efficiency’ or ‘performance’, is to be defined and understood properly right at through industrial efficiency. It means a firm as a technical unit engaged in production of a commodity. Its job is to transform a set of given inputs into some output defined by the production function. In this case, the emphasis will be on achieving maximum ‘productive efficiency’.

If we define the firm as an organizational unit, engaged in production and ‘disposal’ of a commodity for some desired purpose, then the emphasis will be on achieving ‘business’ or ‘economics’ efficiency.

Productive efficiency:

‘Technical efficiency’ and ‘Factor price efficiency’ are called as productive efficiency.

Technical efficiency:

Technical efficiency may mean doing a job in the cheapest possible way, that is, production of a given level of output from the lowest possible combinations of inputs.

Factor price efficiency:

Factor price efficiency, measures the skill in achieving the best combination of the inputs by taking into account their relative prices. This is very important when one input can be substituted for another in the process of production.

Both technical and factor price efficiency can be explained by the following diagram 1.

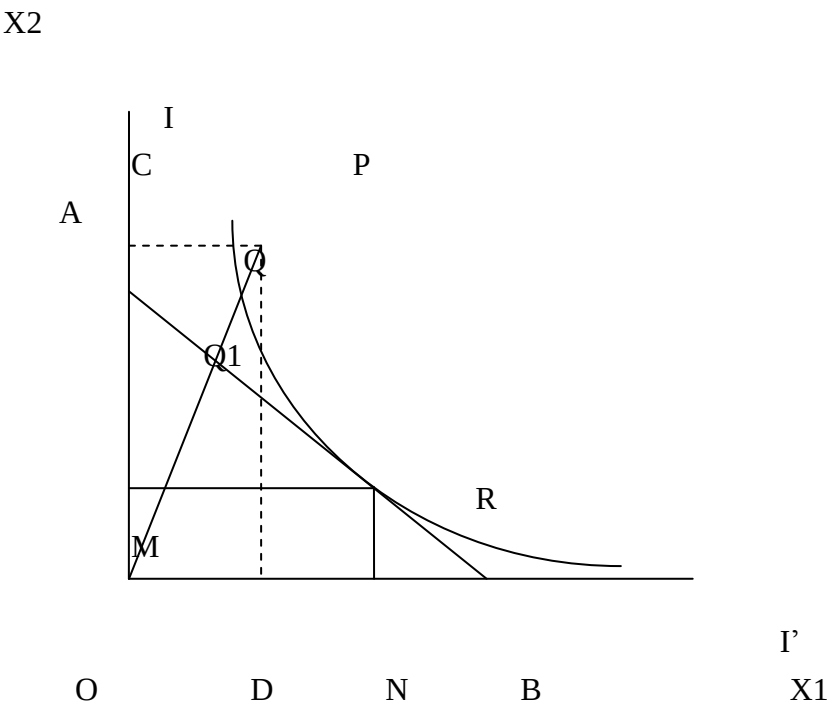


Diagram 1

II' is an isoquant which shows the most efficient combinations of the two factors X_1 and X_2 used to produce a given level of output of commodity. 'Most efficient', means the minimum combinations of the factors required according to the 'best practice' production function for the commodity. A firm may deviate from the II' curve and thus causing inefficiency in the factor uses. Let us take P as the actual situation where the firm uses OD and OC quantities of the two factors X_1 and X_2 respectively of the firm at P in relation to the 'best practice' frontier II' the be measured by the ratio OQ/OP.

AB is the iso cost line in the diagram indicating the combinations of the two factors that can be purchased from a given amount of money and given factor prices. The factor price efficiency for the firm can be measured by the ratio OQ_1/OQ. This is because any combination of the two factors beyond AB line will not be possible when the amount of total resources and factor prices are fixed.

The productive efficiency of the firm at point P can be measured by the product of the two ratios, i.e.,

Productive Efficiency= OQ/OP * OQ1/OQ = OQ1/OP

The nearer this ratio moves to unity, the higher will be the productive efficiency. At point R the productive efficiency will be maximum. This is the familiar tangency condition in the isoquant analysis.

The economic efficiency means efficient selection of goods to be produced, efficient allocation of resources in the production of these goods and efficient allotment of the goods produces among the consumers. Economists argue that correct application of the economic principles will bring about optimal efficiency in the allocation and utilization of all resources, their products, and in competition with all other desires of the community.

The Determinants of Economic Efficiency:

1.2.3 The Determinants of Economic Efficiency

The determinants of economic efficiency can be divided in to two categories:

(i) Internal forces and

(ii) External forces.

Internal Forces:

It means all those activities which define the managerial functions of a firm. As we know for economic efficiency, one must have efficient planning and regulation of the operations.

A willingness to accept changes in the policies, related to the conduct of the business including technological innovations, a smooth flow of work, proper supervision, adequate facilities for wok, including fair pay, etc.

External Forces:

It affects economic efficiency includes the organizational or structural conditions prevailing in the industry to which the firm belongs, short-term fluctuations in the market for both inputs and outputs of the firm, trade union activities and government regulations, etc.

The first set of these factors define the market-structure which shows the number and size distribution of the firms in the industry; The number and size distribution of buyers in the market for the products of the industry, the number of competing products, the conditions of entry in the industry etc.

The market is very much competitive for the firm, the inefficiency may be very low. It is because the inefficient factor or product will be thrown out of the industry because of the strong competition.

There is only one firm in the industry (i.e. monopoly), it will not be subjected to market competition. Its performance may be poor. It may use its resources inefficiently. There strong proposition that the market structure exerts considerable influence on the economic efficiency (e.g. performance) of a firm.

For example, if there is power breakdown, production will be affected adversely, sales or profits will decline, and so the efficiency of the firm will be poor. Similarly, we can postulate the impact of all other probable short-term factors on the economics of the firm. All external forces together may create conditions for the market imperfection which eventually affects the allocate efficiency of the firm.

The allocate efficiency is defined through a set of general equilibrium conditions. It occurs when output is at that level where marginal cost equals price in each product for each firm. Deviations from such a situation will have important implications for the economic efficiency of the firm, particularly from the social point of view. The present theory of the firm provides only few guidelines for this. The bulk of the information on this aspect comes from the empirical analysis of the economics forces operating at the firm and industry levels.

3. Measurement of the Efficiency Levels

1.3.1 Measurements of the Efficiency Levels:

Measurement means quantification which is essential in industrial economics in order to make it empirically relevant. There is no unique method of measurement for the industrial efficiency or its components. For example, one can measure the technical efficiency through some physical indicators such as capital-output ratio, capital-labour ratio, or actual cost-standard cost ratio. Etc. The last ratio, i.e. actual cost-minimum possible cost, may also be used to measure the internal efficiency of the firm. The overall efficiency of the firm, whether we take the productive efficiency or economic efficiency, may be difficult to measure precisely. Two methods are generally used for this purpose. One is the use of some type of optimization model such as the linear programming and second is the use of the ratios like total productivity or profitability or so on. In the first method a firm has to specify in quantitative terms the objective function as well as the constraints faced to achieve and the apply the standard mathematical tools to solve the problem. To explain the method, let us take a simple linear programming problem.

Let us say, a manufacturer is planning to make two products using three inputs, say, labour, machine-hours and one raw material. One unit of product I requires one-man-hour, one machine hour and two units of the raw material. Similarly, one unit of product 2 requires three man hours, one machine-hour and one unit of the raw material. The total

amounts of the inputs are fixed and given as 18 man-hours, 8 machine –hours and 14 units of the raw material per day. The manufacturer expects Rs. 10 and Rs. 20as price for the two products in the market and will be actually able to sell them. What should be the most efficient level of output of the two products?

Let us take that q_1 and q_2 are levels of outputs of the two products: 1 and 2 respectively at the optimality situation. In this example, the objective of the manufacturer will be to maximize the total sales. The sales or revenue equation for the manufacture is

$$R = 10q_1 + 20q_2 \qquad (2.1)$$

To produce q_1 and q_2 levels of the outputs, the input demand-supply equations will be as

$$q_1 + 3q_2 \leq 18 \qquad (2.2)$$

$$q_1 + 3q_2 \leq 8 \qquad (2.3)$$

$$2q_1 + q_2 \leq 14 \qquad (2.4)$$

Each of these equations shows that the utilization of the input cannot be more than the availability. It may be less of course. Further, we take that there is no negative output of either product since it has no meaning in economics, that is,

$$q_1 \geq 0$$

$$q_2 \geq 0 \qquad (2.5)$$

Now the problem is to maximize total revenue expressed by equations (2.1) subject to the constraints expressed by equations (2.2)-(2.5). We may use the standard algebraic methods for the solution but here we can do it graphically. By plotting all constraints on a two-dimensional graph we get the shape shown inFig1

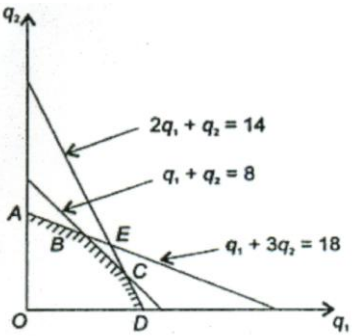


Fig. 2.2 Linear programming problem: graphical s

Figure 1

Each of the constraints, in this graph shows a boundary which the manufacturers cannot cross because of the fixity of the input. They are bounded by all the constraints, that is ODCBA is defined as the feasible area from which the combination of q_1 and q_2 output can be chosen. Any point inside this area will be feasible area from which the combination of q1 and q2 output can be chosen. Any point inside this area will be feasible but inefficient since resource utilization will not be full. Any point on the boundary DCBA will be feasible and technically efficient showing full utilization of at least one input. This boundary cannot be crossed. It is called 'Production Possibility Front'. There will be only one point on this boundary will be economically most efficient from the manufacturers point of view. At this point the objective function will be tangent to the boundary. In this example the PPF is not continuous. It is discrete having linear segments. In this situation the point of tangency can only be at one of the corner points D, C, B or A. Actually we need not draw the tangent. We just note down the coordinates q_1, q_2 of these points. By substituting the coordinated in the revenue equation we can get the best one.

The calculations are as follow:

Point	Coordinates q_1 and q_2	Revenue
D	7,0	Rs. 70
C	6,2	Rs. 100
B	3,5	Rs.130
A	0,6	Rs. 120

The manufacturer is getting maximum revenue at point B showing three units of product I and five units of product 2. Economically, this is the most efficient situation for the manufacturer. The graphical solution as described above is possible if there are only two products to be produced. Suppose, there are n products and m constraints; then the linear programming problem can be formulated as :

$$\text{Maximize } R = P_1q_1 + P_2q_2 + \ldots\ldots + P_nq_n \qquad \text{(i)}$$

$$\text{Subject to} \quad a_{11}q_1 + a_{12}q_2 + \ldots\ldots + a_{1n}q_n \leq b_1$$

$$a_{21}q_1 + a_{22}q_2 + \ldots\ldots + a_{2n}q_n \leq b_2 \qquad \text{(ii)}$$

$$a_{m1}q_1 + a_{m2}q_2 + \ldots\ldots + a_{mn}q_n \leq b_m$$

$$q_1 \geq 0,\ q_2 \geq 0,\ \ldots\ldots\ldots\ldots,q_n \geq 0 \qquad \text{(iii)}$$

some of them constraints may be related to allocation of the inputs, some to sales potential for the products and some to the other things which the firm encounters in connection with its business. The objective function needs not be revenue maximization only. It may be profit maximization or anything else which is to be maximized or minimized. To solve

such a problem, there is an algebraic method known as Simplex Method. For details of this method and other programming techniques for getting the efficiency conditions, one can go through the standard textbooks of Operations Research or Economics. It is beyond the scope of this book. The limited use of the linear programming technique here was to demonstrate its utility to measure the efficiency conditions.

It is true that programming techniques are ideal for determination of the efficiency conditions but there is a big question mark about their actual uses in the business circles. Few large corporations having sophisticated planning machinery may, of course, be adopting them, but by and large the firms, in general, adopt their own ad-hoc methods for the efficiency maximization. They will select some performance indicators consistent with their desired intentions in the business. For example, firms may set some target for total factor-productivity or profitability for themselves. If they achieve that one; then they may be called efficient otherwise not. Total factor-productivity is a ratio of the gross revenue divided by the total cost of production. Profitability is the return on the capital invested in the business. The choice of the indicators for the efficiency or performance measurement depends on the goals of the firm. The alternative goals of the firm, their implications and various types of business ratios used by the firms for judging their efficiency will be discussed later in details in this book.

LESSON 4

4 .Types of Organisational Form

1.4.0. The organizational Form and Alternative Motives of the Firm

1.4.1 Types of Organizational Form:

In Industrial economics a business firm may be identified on the basis of certain characteristics like the type of business it is doing, its size, the pattern of ownership, and so on. The third characteristics, that is, the pattern of the ownership is conventionally used to describe the type of organizational form for the firms. According to this, we can classify the firms in categories like proprietorship, partnership; and the corporation. This kind of classification is a legally recognized institutional pattern with in which business firms operate all over the world. In the traditional theory of the firm we do not find such classification. The firm, conceived as a technical unit in that theory, is doing the job of production of goods and services for the sake of profits. It is run by a entrepreneur who is taken as an owner-cum manager.

The organization pattern of the firms on the basis of their ownership is shown in fig.

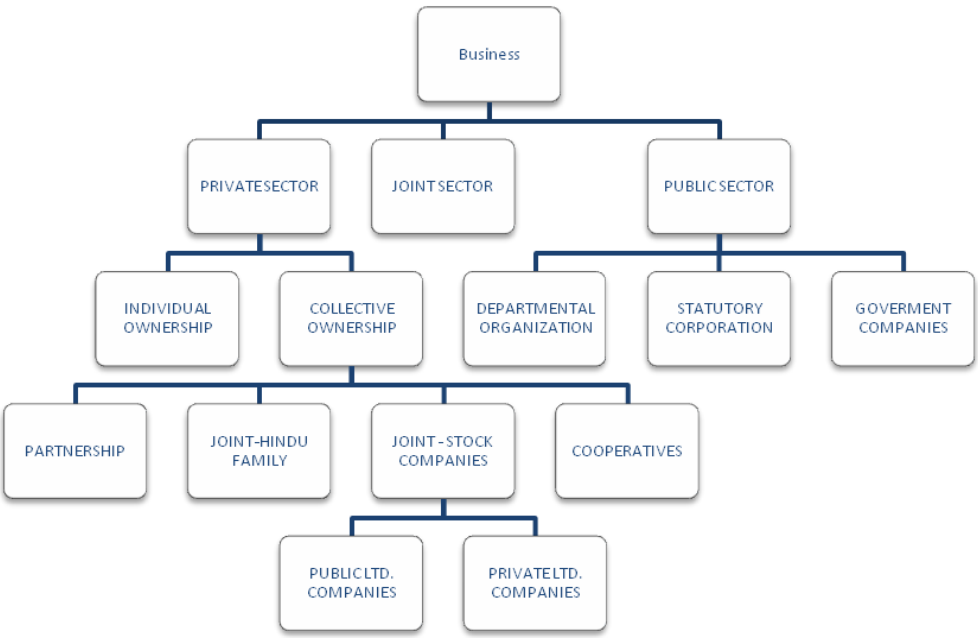


Fig. Different type of firms

All firms doing business can be first classified into three categories:

(i) Private sector
(ii) Public sector, and
(iii) Joint Sector

In the private sector the ownership is exclusively in the hands of the private individuals, whereas in the public sector, the state (Central or State Governments) owns the firm. In the case of Joint-Sector, the government, the private entrepreneur and the public together share the ownership, management and control of the firm:

Private Sector:

Sole Proprietorship:

This is the simplest kind of business organization which is owned and controlled by a single individual. Alternatively, it is called 'one-man business'. The sole proprietor may have any number of persons working for him but they will be just paid employees or family members having no share in the ownership of the business.

Merits:

1. It is easy to establish. With very little formalities one can go through the formation of the firm.
2. There is incentive to earn more in the sole proprietorship. The entrepreneur puts his best effort in the business and gets the appropriate reward for that.
3. There is independence of control over the business.
4. The decision-making is very prompt.
5. The secrecy of the affairs of business can be maintained.
6. The proprietor being in touch with the work of the firm can ensure efficient performance.
7. The operations become flexible according to the conditions prevailing in the business. He can expand or curtail production, if the situation demands, without any hitch.
8. Sole Proprietorship eliminates concentration of wealth and provides equal opportunities to everyone to use his talents and resources to his maximum advantage.

Demerits:

1. There will be limitations both in resource mobilization and managerial capabilities. He may not get adequate finances, raw materials, etc. in time and being alone, cannot mange every department of his business efficiently.
2. The sole proprietor will be personally liable for all kinds of risks attached to his business. His liabilities will be unlimited. Because of this he may be very orthodox and conservative in the management of his business. This, in turn, may introduce some efficiency as one can reduce risks at the cost of profits.
3. The life of a firm having sole proprietorship is uncertain. ‘After the death of the proprietor there is no guarantee that the business will continue.
4. All the qualities required for success in business are rarely found in one man. A sole proprietor is likely to commit certain errors while conducting his business. There will not be anybody else to correct him.

Sole proprietorship is suitable when the markets are limited and highly localized and the commodity or service is to be provided according to individual requirements. Many examples can be cited for this such as tailoring, ornament manufacturing, printing, book-binding, etc. In practice we will find hundreds of such firms in the small scale and

tiny sectors the economy. They will be working hard mostly to get maximum profits from their business.

Partnership:

In this form of organization, the firm is owned or managed or controlled jointly by more than one person. All of them agree to share the profits of the firm. In fact, the sharing of profits is the basis for defining partnership according to the Indian Partnership Act. It is not necessary for the partners to one the capital jointly or to manage the firm jointly. The contribution of the partners in running the business need not be the same. The minimum number of partners is two and the upper limit is twenty as per Section 11 of the Indian Companies Act. The partnership is created by mutual consent and voluntary agreement. Registration of a business under partnership is essential under the shops and Establishments Act in order to take legal help in enforcing the terms of agreement on the partners. The liability of the partners in the business will be unlimited. The limitation of the liability through mutual agreement is not possible legally under partnership. A variation of the partnership type of organization in India is the Joint Hindu Family business. The head of the family manages the business, other members help him. The profits are shared by all members of the family according to their share or contribution in the business. The family members are free to leave the joint business whenever they like to do so. This type of business continues, since after the death of the head of family a new head will take over to keep the business going. Registration of this type of business is not necessary. Joint ownership of the property is the basis for such an organization. The liability of the members of family except the head will be limited.

i) There are many types of partnership depending upon their specific role in business. There are 'active partners' who bring in capital and take active interest in the conduct of the business. There are 'sleeping partners' who bring in capital, share profit gains but don take active interest in the conduct of the business. There is a category of partners which is called 'secret partners' being unknown to the public. There are 'nominal partners' who just lend their name and credit to the firm without contributing any capital or without any active interest in the business. In the eyes of the law such partners are equally responsible for the liabilities of the firm. A person who is not a partner actually but acts as a representative for firm may be treated as a partner which is called as 'quasi-partner' or 'estoppel-partner'. Then there is a category of 'minor partner'. Such a partner does not share any personal liability of the firm. There is a category of partnership which is prevalent In Western countries which called 'limited partnership'. In this case the liability of the partner will not be unlimited but limited. This helps in boosting the partnership organizational form

without any danger of losing the personal private property of the partner in the case of business losses. In India this type of partnership is not recognized by the law.

The advantages of the partnership are several, such as, ease of information; larger financial resources; combined managerial abilities and judgments, flexibility and elasticity in operation; combination of management and ownership; mutual cooperation; protection of minority (in the sense of partnership) interests; secrecy in business and adequate credit availability because of unlimited liabilities of the partners.

The disadvantages are; unlimited liabilities of each partner, risks from dishonest co-partners, uncertain life, lesser public confidence, non-transferability or restricted transferability of the partners' interest in the business, and liability of the partner even after his retirement form the firm.

Like a sole-proprietorship the main motive of partnership firm will be profit maximization. This is clear since the very basis of defining partnership is the sharing of the profit. Survival in business may be looked upon as an alternative goal for such a firm.

ii) Joint-Stock Companies or Corporations: This is the most important form of the business firm. It is popular all over the world. A joint-stock company is legal entity with a perpetual succession and a common seal. It is a voluntary association of certain persons formed to carry out particular purpose in common. It is just like an artificial man created by the law whose life is independent of the lives of the members of its association1.

iii) Legal Entity: As mentioned above, a joint-stock company is created by law, who own it. It is capable of holding property, making transactions and legal proceedings in its own name. It is the official seal and signatures that matter in the dealings of a joint-stock company.

Corporate Existence:

According to the law, the mode of incorporation and dissolution of the company and the rights of the members to transfer shares guarantee the existence of the company quite independent of the life and tenure of the members. It, therefore, enjoys perpetual succession.

Corporate Finance:

A joint-stock company raises its basic capital for investment in the form of shares. The shares are purchased by the public who become owners of the company. The number of shareholders depends on the type of company.

Centralized and Delegated Management:

A joint-stock company will be having a large number of shareholders. All of them cannot take active part in the management of the company. Actual control and management is therefore delegated by the shareholders to their elected representatives called directors. The directors are assisted by the executives who will be professional managers in their respective fields. All policy decisions are made at the director' level but routine working decisions are left to the managers' discretions who in fact control the whole business.

Transferability of share:

The shares of a joint-stock company are freely transferable. They can be sold and purchased just like a commodity I the share or stock –exchange market. Any member can thus withdraw from the ownership of the company and a new one takes his place.

Large Number of Members:

The number of shareholders of a joint-stock company will be quite large except in one particular type where it is restricted to maximum of 50. The ownership of the company will thus be very much diffused or widespread.

Limited Liability:

The responsibility or liability of the members of a joint – stock company is limited to the extent of the nominal value of the shares held by them. The liability of the company as a whole of course remains unlimited.

Statutory Regulations and controls:

In order to maintain certain uniformity of principles with regard to the management of the company, and to avoid clashes of interest in the administration as well as to protect the shareholders, a corporation will be under statutory control by the government. The law will regulate the company or corporation for the benefit of the public in general.

Publicity and compliance to various Legal formalities:

A joint-stock company has to file a set of documents with the Registrar of Companies and publish them for the information of the public such as Memorandum and Articles of Association, Balance Sheet and Profit & Loss Accounts and Annual Reports.

A joint-stock company is different from a partnership organization on the ground of its mode of creation, legal status, number of shareholders, limited liability, transferability of shares, separation of owners from the management and size of resources and business auditing of accounts, and strict regulation by the law.

All joint-stock companies may be put in the following two categories :

(1) Statutory Corporations, and

(2) Registered under the company Act.

A company formed by a special Act passed by the Parliament or State Legislature is called statutory corporation. Such companies will be governed according to the provisions of the Act. The liability of the members of such a company will be limited but they may not use the word 'Ltd' as a part of their names. Few examples of such companies are Reserve Bank of India, Industrial Finance Corporation, State Bank of India, etc. The companies formed by registration under the Indian Companies Act (or similar Acts outside India) are called 'registered companies'. Such companies may be limited by shares or limited by guarantee or unlimited companies. In the case of a company limited by guarantee, the liability of each member will be limited to the extent of commitment he has given or agreed. There may not be any share capital in such a case. Such companies will be normally non-profit earning ones. In the third case the liability of each member remains unlimited but such companies do not exist in India.

All Companies limited by shares may again be classified, as 'private limited' company and as 'public limited' company. A private limited company is one which by its Articles of Association (a) restricts the right of the members to transfer shares, (b) limits the number of members to fifty excluding past or present employees of the company and (c) prohibits any invitations to the public to subscribe for its shares or debentures. Minimum number of shareholders for a private limited company is two.

A public limited company is one which has no restrictions as mentioned in the case of a private company. It will have a minimum of seven shareholders and the upper limit is open for any number. It has no binding for invitation to public for subscribing capital. Being open to the public a public limited company has to publish in Balance Sheet and Profit & Loss Accounts yearly along with the Annual Report. It will be under greater degree of legal control as compared to a private one. There is yet a third type of limited

company. It is called ‘Private Company Deemed to be Public’. A private limited company which holds 25 percent or more of the paid-up capital of public limited company or 25 per cent of more of whose paid-up capital is held by one or more public limited companies or whose average yearly turn-over is more than five crores rupees is deemed to be a public limited company. Further, there is another classification of companies according to which a company is called ‘Holding Company’ if it holds more than fifty percent of the issued and paid-up capital of other company or if it has more than fifty per cent voting power, or by securing itself the right to appoint the majority of directors of the other company directly or indirectly. The other company is called ‘Subsidiary Company’.

In order to facilitate the choice of the company form, let us examine briefly the merits and demerits of the public and private limited companies. A public limited company having large number of shareholders is preferable from the social point of view. It has diffused ownership pattern which is desirable from the point of view of wider participation in business and at the same time reduction in the concentration of wealth in society. It will be more democratic and open to the public scrutiny as compared to its counterpart of private company. The financial viability of such a company will be more because of larger number of shareholders which will provide greater scope for growth. States, normally, give more protection and help to such companies. The transferability of shares through stock-market mechanism is another big advantage of public limited company form the point of view of valuation of shares. In the case of private company, there is rigidity in every aspect. That is more or less like a family business with corporate tag. Protection of share holders will be less in such a company. Decision-making will be less democratic. This may be course an advantage of the form. Personal touch will be more here as compared to the public companies where shareholders will be passive and the business will be run by the managers. A private company may start its business quickly without waiting from the governmental clearance, but a public company has to get the certificate of commencement of business. Looking at the corporate picture in a country, both these types of companies are equally popular. Public limited companies are larger in size than the private ones in most of the industries.

There are advantages as well as disadvantages of the joint-stock companies. In the context of advantages, there is no controversy over the assertion that the growth of the corporate-sector (i.e. joint-stock companies) in modern economics has contributed a lot in fostering points to which we can attribute the popularity of the joint-stock companies are as follows:

1. Limited Liability which reduces the risks in business from individual investors point of view.

2. Perpetual succession which guarantees continuity of business for longer period. The business will be more stable, durable and enduring.
3. Transferability of shares which secures freedom to withdraw from the business and to increase wealth through share price escalation without affecting the life of the company.
4. Financial strength becomes stronger because of the contributions of shares from a large number of persons.
5. Centralized team management through board of directors ensures better decision-making.
6. The scope for expansion improves due to better financial and managerial resources.
7. Better confidence from the creditors as a result of better position of the company regarding its credit-worthiness.
8. Democratic set-up with dispersion of business ownership and thus reduction in the concentration of wealth in society.
9. Lesser burden of taxes as compared to the other forms of organization since being a corporate body it gets many concessions from taxation.
10. Cheaper and better production because of large scale production with the use of modern technology which the company can afford.
11. Greater market power as a result of its size which helps in reduction of the uncertainties in business.

There are some unfavourable points also

1. Too much legal formalities right from the time of formation as well as in its day-to-day working. This may disturb the normal working of the company.
2. Divorce between ownership and management. This is a serious limitation. The shareholders become passive and the control of the business goes in the hands of managers who may not care much about the interests of the owners. There is no guarantee that enterprises run by professional managers are more efficient than those managed by the owners.
3. Few shareholders having greater number of shares at their credit may not care much about the minority shareholders.
4. Promotion of frauds is possible under joint-stock system because of lack of control from the shareholders on its operations.
5. Speculation in the stock exchange market about the company shares may spoil its good will in the goods market.

6. There may be considerable delays in the decision-making and their timely implementation because of administration red-tapism.

Weighing the good and bad sides of the joint –stock companies the balance tilts towards the favourable side and that is why this system is gaining more and more popularity. In India, for example, every month about 400 to 500 new joint-stock companies come into existence.

Cooperative Society:

A cooperative society is a form where people associate voluntarily for the furtherance of their common economic interest. Consumers' cooperative societies, producers' cooperative societies, marketing cooperatives, cooperative credit societies, cooperative farming societies, and housing cooperatives are some examples of this type of organizations. The basic motive of such societies is to provide maximum service to its members and not to make profits. There may be some surplus in profit from coming from the business but that is a secondary thing. Normally, cooperative societies are formed to protect the weaker section from the stronger one in the situation of scarcity of goods and services. All cooperative societies will be formed through voluntary association of the persons as members contributing their share in the finances to run the business. Each member will be equal voting right. They will be highly localized and small in size. Whatever is the profit, it will be partly distributed as bonus to its members. Some fixed return on individual contribution in the capital is assured by taking into account the opportunity cost of capital. Where individual contribution in the capital is very low, say one share of Rs. 10 or Rs. 20 or like that, nobody bothers about the return on that. All cooperatives will be non-political non-religious bodies. They are registered under the Cooperative Act. Government will have control over their working and supervision. They are encouraged by the state and so they get considerable help in this regard.

In the context of industrial economics, producers' cooperative societies are relevant for us. Such societies are formed by small producers to face the powerful capitalist. They may either work independently or pool their production for marketing through the cooperative or all producer members are treated as employees and paid wages or salaries for their work. Whatever to be organization, the society does its best to supply the raw materials and tools, and take effective measures to sell the products at reasonable prices. Such producer's societies are quite different from the joint-stock companies. They are small, localized, primarily established for protection of the members but the joint-stock companies operate with some business motive. The shares of a producers' society cannot be transferred as in the case of a joint-stock company. The management will be different in

both the cases. Both, of course, are democratic set-ups having considerable patronage from the state.

Public Sector Companies:

The Public sector plays a vital role in the socialistic and mixed economics mainly for three reasons: (a) to gain control of the commanding heights of the economy, (b) to promote critical development in terms of social gains or strategic value rather than primarily on consideration of profits, and (c) to provide commercial surplus with which to finance the economic development of the country. In order to achieve these broad objectives government companies are established in appropriate numbers. The important forms of organization for such companies will be:

1. Departmental organization (like Post and Telegraphs, Railways, Broadcasting, and Defense Undertakings in India): Under this system, companies are organized like any other government department. The company will be managed by a top executive appointed by the Ministry or Inter-departmental Board responsible for that.
2. Public Corporation: These companies are established under the specific Acts of the Parliament or State Legislature. They are called statutory corporations such as The Damoder Valley Corporation, The Industrial Finance Corporation, The Life Insurance Corporation, The Indian Air Lines Corporation, etc. They are established in the interest of the public with best possible management. The capital is usually provided by the Government and the corporation is managed according to the provisions of the Act. They are given autonomy for their internal management but the broad policies are decided by the Government. Their annual reports are placed before the Parliament as they are answerable to it for their activities. Public service rather than profit maximization becomes the main aim of such corporations.
3. Government Companies : A government company, according to the Indian Companies Act 1956, is any company in which not less than fifty-one per cent of the share capital is owned by the Central or by any State government or governments, or shared partly by the Central and State governments. This is a popular form of public enterprises. It is organized under the existing provisions of the Companies Act just like any other joint-stock company. Hindustan Machine Tool Ltd., Hindustan Steel Ltd., Hindustan Aircrafts Ltd. And Hindustan Shipyard Ltd. are few examples of such companies.

Joint – Sector

The concept of joint-sector implies the participation of both the government and the private sector in the business. Under this organization, a firm is owned and run jointly by the government and a private entrepreneur. This is done in order to strengthen the spirit of the mixed economy effectively. The public sector and the private one work together under the same roof and put a mutual check on each other. The best aspects of these two types of organizations are combined together in the interest of the public. A joint-sector can be formed in India according to the Companies Act 1956. Following the Act , the Government of India formulated the guidelines for formation of the joint sector company through the participation of (a) the government, (b) the private entrepreneur, and (c) the financial institutions and investing public. Such guidelines are given below.

	Pure Indian firm	Indian firm with foreign collaboration
	Per cent equity capital	
1. Government	26	25
2. Private Investor	25	20
3. Foreign Collaborator	Nil	20
4. Investing public including financial institutions	49	35

Not more than 50% of equity can be owned by the government and financial institutions together. A single private investor is not allowed to hold more than 25% of the paid-up capital without permission of the government of India.

The advantages of the joint-sector are (1) it helps to foster the industrial development with social justice, (2) it helps to check the growth of the monopolies and malpractices in the business: (3) it provides scope for more financial viability and strength, (4) it combines the best of both the systems, and (5) it makes nationalization unnecessary.

There are some limitations also, First, there may be conflict between the two parties; secondly, it may lead to managerial autonomy making the owners passive in business.

LESSON 5

1.5 Business Motives

1.5.1 Business Motives:

We have examined the various organizational forms for a business firm in the preceding sections of this chapter. Now let us discuss, in brief, the alternative business motives or objectives which induce a firm to work. This is an important aspect in the theory of the firm since it is the objective which will be the basis to judge its efficiency and which regulates the conduct of the firm in the market. Also, as we have seen above, the choice of the business form and the objective to be pursued are interlinked together. One, therefore, should have a fair idea of what the firms are ultimately interested in. The objectives or motives or goals or intentions as one may prefer to call them, that have been identified and discussed in the relevant literature, are as follows:

1. Profit Maximization

This is the most conventional and widely used business motive in the theory of the firm and industrial economics. Profit is taken in the usual sense as a difference between revenue and total cost of production in the business. The case for the profit maximization as a goal of he firm is based on the assumption that the firm Is an economic unit owned and managed by an entrepreneur who is an 'economic man' working for the profit. The identity of the firm is attached with the identity of this 'man' whose rationality is judged through the surplus he gets from his business. The use of profit a measurement of the surplus is taken as a simple and unambiguous approach, and so its maximization follows as a natural choice of the business objective. The traditional theory of the firm has been following this approach ever since its birth. Even today persons like Milton Frideman are strong proponents of this approach. He argues that the profit maximization assumption is more convenient, precise and economical than any other alternative. Looking at the reality of the business in the present-day situations, we may get enough evidence to support the profit maximization objective. Even today when business is very much dynamic and diversified a firm is treated to be efficient if it makes sufficient profits. The firms which get eliminated from the market are basically those whose profitability situation is not satisfactory.

The objective of profit maximization seems to be all right but there are a number of attacks on its operational validity. Let us examine it form the market side first. If the industry to which the firm belongs is highly competitive then profits will be frittered away because of the forces of competition and only normal profit will be left which makes the firm survive in the business. Now, suppose the industry is state-owned and controlled, then firms will not bother about profit as it is treated immoral under socialism. In both the

situations – competition and socialism – there is no scope for profits, in one case because of the market forces and in the other case because of the institutional requirements. Let us take a more complex situation in which the industry is under imperfect competition (monopoly, monopolistic competition, oligopoly, etc).and full of uncertainties. This situation will not be profitless. Monopoly elements present in the industry may give rise to profit and if there are no uncertainties then one may be justified and argue for the profit maximization goal for those firms which are fortunate enough to have some market power, Normally, as Knight observed, market will be full of uncertainties and the occurrence of the profit will be linked with such uncertainties. If we take profit as an uncertain gain then it cannot be taken as basis for maximization in order to assess the efficiency of the firm. Under this situation the appropriate goal can be conceived as the long run survival in the business with satisfactory entrepreneurial income (normal profit + excess profit).

Another serious difficulty with the profit maximization goal is with respect to its relevance in the context of modern joint-stock companies where management and ownership is completely separate. While the full implications of this kind of organizational form on the choice of the business objective will be discussed shortly, at this stage we may simply say that it is hard to believe that managers who control the business, act primarily in the interest of their owners. Instead, they may work more in their own interest by maximizing their utility rather than profit. In the sole proprietorship and up to some extent under partnership, we may argue that management and control is combining, so profit maximization goal is relevant for them. Even in these cases we may cite alternative goals for the entrepreneurs as the pursuit of power, status, prestige, independence or a quiet life which may be furthered by policies different form those required for profit maximization.

Yet another limitation to the profit maximization goal is related to its correct measurement. Accountants define profit as difference between gross value of products, by-product, work in progress and work don for others minus total expenditure. There are elements of arbitrariness in measurement of profit in this way. One element is that of valuation of the stocks unsold, second one is valuation of the work in progress and the third one is related to the valuation of the imputed cost of non-hired factors. Even calculation of the depreciation may also be arbitrary. The firm may select the criterion for valuation of these things in such a way that profit figures are understated in order to save taxes. This may make profit maximization a ‘hidden’ objective rather than explicit. Further, if the imputed cost of non-hired factors such as ‘salary’ of the entrepreneur are not included in the cost as normally is the case in managerial accounting, the profit then will be interpreted as entrepreneurial income whose maximization is different from the maximization of the pure economic profit. Further, the profit maximization hypothesis in theory runs in terms of absolute magnitude. In practice it is seen to be observed in terms of

profitability maximization. For example an investor getting twenty thousand rupees as profit from an investment of Rs. One crore will be far inefficient as compared to one who gets Rs. Ten thousand from an investment of Rs.One lakh. Profitability is thus an important objective rather than absolute profit that should be emphasized and pursued.

2.Sales Maximization

The conventional theory of the firm as we have seen above is basically neo-classical in nature which assumes profit maximization as the goal of the firm. However, recognizing the institutional organizational set-up of the firm in the present-day context several new approaches have been suggested which may be grouped together into two categories viz., maximizing some function of the firm and behavioural approach. The approach of sales maximization is an important one in the first category which has attained the status of being the best known alternative explanation observations. In the original exposition of the sales maximization hypothesis Baumol assumed that firms maximize sales revenues subject to a minimum profit constraints, but it may also be viewed in a "pure" form when there is no such profit constraint. Fig 3.2 illustrates the hypothesis in its various forms along with the profit maximizing situations.

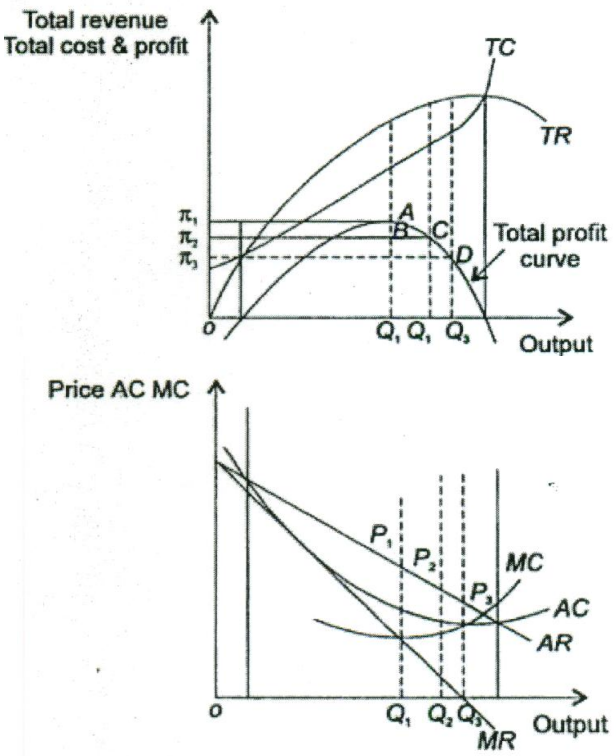


Fig. 3.2 Sales and profit maximizing situations

In this diagram the output level that corresponds to the maximum profit situation is OQ_1. The normal condition for profit maximization, i.e. marginal revenue equals marginal cost at this level of output with rising MC Curve. The maximum profit is shown by $O\pi_1$ in the upper loop of the diagram. Now if the objective is sales maximization and there is no constraint attached to it, then output level will be OQ_3 level of profit which is positive. The occurrence of the positive profit at the unconstrained sales maximization should not be taken for granted. It may be positive or negative depending whether the total revenue and total cost curves intersect each other after or before the maximum revenue position. In our diagram incidentally we get positive profit situation. If the owners of the firm are satisfied with this level of profit ($O\pi_2$), they will continue to produce OQ_3 level of output and there is no reason for deviating from this. Suppose they are not satisfied; then they can increase the level of profit at the cost of sales. Let $O\pi_2$ be the minimum acceptable level of profit. This is the constraint the firm puts for sales maximization. The level of output corresponding to this level of profit is OQ_2 which is greater than profit maximizing output OQ_1 but less than OQ_3. The firm is sacrificing AB level of profit to get Q_1Q_2 extra output for sales; because of this increase in output the price level that the firm charges reduces form P_1 to P_2 as shown in the lower loop of the diagram.

In order to support the sales maximizing objective Baumol has given the following intuitively appealing observable facts from the real life situation of the firm.

1. A small change in sales usually brings with it great changes in selling and technology that are typically brought about by an equivalent change in profits.
2. Consumer may shun the firm's product if they feel that it is declining in popularity.
3. Financial institutions and the money market may be unresponsive to a firm with constant or falling sales.
4. Firms with constant or falling sales may have difficulty in finding or maintaining retail distributors.
5. Constant or falling sales may cause morale problems internal to the firm.
6. Declining sales may mean reduced market power and consequently increased vulnerability to the actions of competitor firms.
7. Separation of ownership and management in the modern corporation may mean that management is more concerned with sales than with profits.
8. Executive salaries have been found to be more highly correlated with the scale of operations of the firm than with its profitability.
9. In response to the question, "How's business?" an executive will typically reply in terms of what his firm's sales levels are.

10. Firms only reluctantly abandon market area or products even when they are unprofitable.
11. Firms that boast that they maintain a national system of sales outless may be forced to maintain unprofitable outlets in order to fulfill that boast.

The model suggested by Baumol for sales maximization is yet to be established fully through empirical verification. However, its theoretical base is strong enough which cannot be disbelieved easily.

(i) Maximization of the Growth of the Firm

This is another type of the alternative goals suggested for a firm which falls in the category of maximizing a function subject to some constraint. According to this the firm aspires to maximize the rate of growth of certain aspect of its activities such as sales, profit, assets or value of the equity shares subject to some well defines appropriate constrains. Baumol, for example, suggested maximization of the rate of growth of sales subject to a short-run profit constraint. Why does the firm want to grow like this? Baumol himself has given the reply to this question. In his growth model he argued that growth is desired primarily as a mean to greater profitability. The firm seeks to determine the optimal short-run rate of growth that will make a maximal contribution to long-term profitability. If this is so, then his growth maximization hypothesis is a proxy for the profit maximization hypothesis. The only difference is that the attention now shifts to the long-run profitability of the firm form the short-run.

Like Baumol, Galbraith had argued that the firm may maximize the rate of growth of sales subject to an acceptable level of dividend and retained earnings. Galbraith sees a high rate of growth of sales as the best way to ensure the autonomy of the techno-structure. Similarly, Penrose argued to maximize the growth of total productive assets of the firm. She further assumed this, equivalent to the maximization of the retained earnings since the ability to finance growth depends crucially on the retained earnings that are available for reinvestment. Various constraints were used by her, which limit the growth such as downward sloping demand curve, rising costs and risks. Risk is taken as a function of the entrepreneurial activities like diversification, sales efforts, brand names, marker research etc.

The most important contribution in this area came from Marris. According to him a firm maximizes the growth of total productive assets subject to a managerial security constraint. To quantify this security constraint, he used the ratio of the market value of the firm to the book value of its equity. Managerial security demands that the debt/equity ratio must be sufficiently high to support and stimulate growth but not too high which may cause a threat to the job of the managers; the liquidity (ratio of liquid assets to total assets)

must be high in order to have more internal funds for investment but it should not be too high since in that situation it will bring displeasure to the shareholders because of low dividend. Marris further argued that the firm grows by diversifying its products and technology. The diversification depends on the expenditures on R & D. advertisement and charging reasonably low price for the products. All such activities ultimately reinforce the growth of the firm and all constraints are ultimately satisfied. The short-run outcomes of all growth maximization models may be quite different from the profit maximizing conditions, but it appears the long-run interests and decision of growth, sales and profit maximization are virtually identical. Policies that maximize the long-run growth of a variable such as assets or sales will be profit maximizing policies also.

The proposition of growth maximization as the motivational goal has not yet been tested fully through the empirical facts. The main trouble is regarding the correct specification of the constraints. How much profitability or security be regarded as appropriate to put a constraint on the growth maximization for the firm? There is no objective criterion to find this precisely; hence, the growth maximization hypothesis may not be operationally valid.

iv. Maximization of the value of the Firm

This particular motive for the firm has been suggested on the ground that managers constrained their decision-making by taking into account the best long-run interest of the shareholders (owner).The variable usually take for maximization is the value per share of the equity capital in the market. This seems to be quite appealing since fluctuation in the value of the shares is the basis for operation of the stock exchange markets. However, the value of the firm in the form of increase in market price of its equity capital depends on the current level of profits and expected future profit. If so, then Even the increase in the value over the subscribed or book value of the equity is also a surplus which the market generates for the firm. One may argue that apart from the profits – current or expected – the value of enterprise depends on the structure of the financial assets. If the marginal efficiency of the investment is well above the cost of borrowing, a firm can increase its value by increasing profits through employing additional borrowed capital and using the profits for further expansion of the firm. But again in this case, it is profit and growth motives which are playing the crucial role in increasing the value of the enterprise. We may say that the motive of increasing the value of the enterprise is important but it is not independent of the profit maximization motive.

iv) Managerial Motivations

The theory of the firm that we read under microeconomics even today assumes an abstract concept of entrepreneur who owns and manages the affairs of the firm. In this case, one need not see any conflict between the motivation of the manager and the owner, since the same person is having these two roles. The owner's objective of maximization of profit or growth or value of enterprise will be pursued here. However, if we take different people doing these two roles as in the case of large joint-stock public companies, then there is considerable scope for conflict between their objectives. The individuals who manage and control the affairs of such companies are not the shareholders (i.e. owners) but the managers, engineers and other professionals who may have their own set of motives, needs and desires. They need not worry much about the motives of their masters. Berle and Means were the first to suggest that the separation of ownership and management results in such important consequences on the motivational choice for the firm. Their work was followed by many authors later on such as Marris, Monsen and Downs, Williamson and Galbraith. The theories developed by these authors may be designated as 'managerial theories'. The theories are different in approach and content but they have a common core or logical foundation which may be described by the three elements:

(a) the separation of ownership and management;

(b) the divergence between the motives of the owners and managers and

(c) the assumption that the business environment provides a set of discretionary one need not take the owners and managers as completely separate.

They may have some minimum common purpose which puts the constraints on managerial decision-making in spite of the discretionary powers with them. In order to see this point, let us examine some of the theories of managerialism.

In the Marris model which we have already briefed under the growth maximization, there is separation between ownership and management but the conflict between their objectives is not apparent. The basic goal is the growth of the firm which Is in the interest of the managers and owners. Managers dominate the scene through their control over the business. In Berle-Means' analysis, the effective separation between ownership and management is assumed but the owners are not left unsatisfied with the rate of dividend they get, though managers are free to take the decisions. Brele-Means' work was extended further by Galbraith who argued the "the tecnostructure" (i.e. managers, engineers, and the specialists) completely monopolizing the decisions regarding product price, quality and quantity, distribution of profits, etc., ignoring consumer sovereignty and being substantially immune to stockholders' pressure, in the large companies. Under this situations, if we take the view that managers do not care for the share holders' interests

then why and how modern large corporation are getting abnormal profits, is not clear. The results of the Kamerschen's study clearly show higher profitability for the corporations when their management was shifted from the owners to the managers. Of course, this not enough to discard Berle-Means-Galbraith hypothesis but certainly we can say that it is yet to be established fully through empirical investigations.

Monsen and Down's study of the managerial firm is quite interesting. They argued that the managers of the firm try to maximize their own life time incomes. They assumed that in view of the separation of ownership from the management, the stockholders do not exercise any control over the business. They are just content with satisfactory level of profits. The managers being in effective control and having discretionary powers behave in a way so as to maximize their life-time earnings. In doing this, they will be risk averters and keep the stock holders satisfied.

The most interesting and analytical work on the managerial behaviour has been suggested by Williamson, which describes the real life situation and is capable of generating testable results. Williamson, like others, assumes the separation of ownership from management in the modern corporations and concludes that managers can pursue their own self-interest once they get the goal of profits at an acceptable level, paying sufficient dividends to the owners and causing the firm to grow. According to him the manager's utility and self-interest depend upon:

(1) his salary and other forms of compensation;

(2) the number and quality of personnel who report to him;

(3) non-financial perquisites from the business and

(4) the amount of discretionary spending and investment he commands.

The manager will try to maximize his utility which is a function of all these four variables subject to the minimum profits and growth constraints for the firm. His model is important in the sense that it provides guidelines for the managers to act when either demands for the product changes or there is additional taxation. In other words, the adjustment in the policies can be prescribed under Williamson's model whenever there is some external factor affecting the firm. In a normal situations a firm under a Williamson utility maximizing manager will spend more on staff expenditure and maintain more organizational slack than will a profit maximizing firm. Perhaps all public sector corporations may come under this category.

v) Realism-in-Process Theories

So far we were discussing the approaches of defining goal of the firm using maximization of a function subject to some constraints. There exists another category of

approaches which are based upon the behavioural inter-relationships and motivations of the various groups involved in the running of the firm. The very concept of the firm in these approaches changes from a holistic one having a single person as owner-cum-manager to a coalition of individuals or groups and sub-groups of individuals such as directors, managers, shareholders, supervisors, workers, customers, suppliers and so on. All individuals or groups of individuals constituting the firm will have their own goals and not the firm because it has no separate identity. If so, then we will face a situation of multiplicity of the goals. There may be conflicts in the goals of the individuals. How to resolve them? A single person, sitting at the top as General Manager or so, may not be able to enforce conformity in the behaviour of the subordinates to a higher level work. That is, through the mutual consultation or bargaining between the 'parties' concerned under the given set of rules, personal aspirations, goals, etc. This is called 'realism-in-process' approach or simply 'behavioural' approach. There are some important contributions in this field which we would like to brief here.

Like the present economic theory of the firm, the organizational theory is in a state of flux. It means different things to different people as a result of which it has not yet been standardized. Some authors like Merton and Weber examined the sociological aspect of the organization focusing mainly on the bureaucracy and its role in managing the affairs of the firm particularly in 'localizing[' the goals and as a result of which generating a conflict between the goals of different sub-groups in the firm. There has been a 'social psychological approach' in developing the theory where main emphasis has been given on 'efficiency' criteria like productivity, speed, etc. on an experimental basis. Further, some authors approached the problems form the administrative angle dealing with the organizations. Yet there is the work of Taylor which paved the way for the development of the modern management science which deals with organizational aspect of the firm in details. All such theories of organizations, i.e, Sociological, psychological administrative and managerial were partial in nature and very little attempt has been made to link them together and finally with the economic theory of the firm. Cyert and March made an important attempt in this direction and at present their theory is the best known organizational theory of the firm. Leibenstein also tried to integrate the economic and organizational approaches but failed to do so successfully. Taking the firm as a coalition of the individuals and / or groups of individuals, Cyert and March analyzed the processes of the goals formation, coalition formation and decision making in the firm through bargaining, inducements and side payments, etc. They listed five goals in an arbitrary order which according to them represent the main operational objective of the organization and which must be satisfied.

The goals are

(a) **Production Goal** :

There are two elements of this goal. One is the target for production and the second us the stability of production. Both these elements represent the demands of those coalition members connected with production. The achievement of the production goal is necessary for stable employment, ease of scheduling, maintenance of accepted cost performance and growth.

(b) **Inventory Goal:**

This goal reflects the interest of those coalition members who are connected with the sales of the products and their customers. For smooth marketing and to protect production from market fluctuations, there should be a desired level of inventory of the goods with firm.

(c) **Sales Goal:**

It us an important goal which is needed for the stability and survival of the firm. Further, it takes care of the interest of the selling staff since their performance is judged by the, maintenance and expansion of the sales.

(d) **Market Share Goal:**

This say by taken as an alternative to the sales goal. Maintenance of the market share and improvement in it is in the interest of the top manage, end personnel, particularly sales unit, since their comparative performance is judged by it. This goal is relevant for the growth of the firm.

(e) **Profit Goal:**

This reflects the interest of the owners. Further, to finance the investment plans and meeting the working capital requirements, the firm should have adequate profits. Performance of the top management is also judged on the basis of the profit goal.

These entire goal may not give identical decision rules for pricing, output, finances, etc. In fact, there may be conflicts between them. For example, sale goal may require a low price but the profit goal a higher one. How is the conflict between the goals resolved? Cyert and March have suggested proper mechanisms such as quasi-resolution of conflict, uncertainty avoidance problematic search and organizational learning. A detailed analysis of these mechanisms is beyond the scope of this chapter, we can only say that Cyert and March

examined every operational aspect of the firm on the basis of which they were able to suggest a reasonably acceptable behavioural theory of the firm.

An important aspect of the behavioural theories is the 'satisfying' motivation originally suggested by Simon. According to this the firm does not attempt to maximize or minimize any particular function but tries to achieve some satisfactory levels of the goals. For this, the firm sets the minimum standards of performance related to its goals. This is the realistic way to analyze the behavior of the firm.

(vii) **Evaluation of the Goals :**

We have gone through the major business goals currently being discussed in the theory of the firm and industrial economics. One particular conclusion that emerged from this review is that while profit maximization is not the only goal of the firm, it is nevertheless a very important one which is, by and large, complementary with the other goals. Profit is necessary for the survival of a firm. The exact determination of the goal is a very much complex and controversial issue. Each firm will define its goals by taking the internal and external factors into account and then develop the suitable measures of the efficiency based on them. The choice of the business goals is a very important aspect because it regulates the conduct of the firm in the market. Product policy, price policy, investment decisions, etc., all will be based on the chosen goal and goals.

UNIT II
INDUSTRIAL LOCATION

Learning Objectives :

After studying this unit, you should be able to

- **Evaluate the industrial location.**
- **Explain the economic and infrastructural factors.**
- **Describe the theory of location**
- **List out the Rawstrau's principles.**

Industrial Location :

In setting up a factory, a manufacturer has to take three interrelated decisions simultaneously:

(1) The scale of operation;

(2) The technique to be adopted which involves the selection of the appropriate combination of the factors of production; and

(3) The location of the factory. The conventional theory of the firm provides the rules or norms for taking the first two types of decisions but it ignores the third one completely.

A separate branch of economics bordering with the discipline of geography, which is known as ‘ Industrial Location deals with elements of the location or spatial decision-making ’. A manufacturer has to consider several technical, economic and institutional factors for this.

The individual firms react in locating their factories under different physical and economic circumstances. This implies a review of the theoretical approaches to industrial locational analysis. The location pattern of an industry depends on a large number of individual decisions of the firms.

Technical Factors:

These are the physical factors which are more or less geographical in nature related to soil, raw materials, people, climate, etc. The important factors in this category are:

1. Availability of land.
2. Nature and quality of raw materials from land, forest products, agricultural inputs, minerals, and semi-finished products from existing industries.
3. Geographical situation of the factory site in relation to the transport facilities by rail, road, water and air.
4. Quantity and quality of human resources.
5. Energy resources.
6. Availability of water for drinking and industrial uses.
7. Waste disposal facilities.
8. Climate.

Economic and Infra-structural Factors :

Input prices, taxes, markets, skills of labour forces, availability of adequate infra-structural facilities, finance, etc., constitute together the category of economic factors. The general list of factors for this would be as follows:

1. Local Markets.
2. Situation in relation to export markets.

3. Cost of land and buildings.
4. Cost of infra-structural facilities such as transport charges, power tariffs, water- rates, etc.
5. Salaries and wages in relation to skills.
6. Local cost of living.
7. Taxes and subsidies.
8. Cost and availability of finance.
9. Structure of existing industries.
10. Industrial relations and trade union activities around the proposed location sites.
11. Demographic factors such as age and sex composition of local population, literacy, professional skills, etc.
12. Local medical facilities.
13. Cultural facilities such as schools, clubs and other recreation centres.

Communications facilities:

All other miscellaneous location factors may be put in this category. Two of them are:

1. Government policies towards location of new plants, and
2. Personnal factors.

Most of the governments pursue the policies of rapid industrialization of their states. They provide several facilities for locating new plants in some places or regions.

The Geographical Contribution :

Geography is the science of the earth's surface. It examines the earth, its physical features, natural and political divisions, climate, production, and population, etc. Industries appearing on the earth's surface do make some changes in its physical features and production patterns. Recognizing this fact, the geographers considered industrial location as a part of their discipline.

The Central Place Theory :

In simplest terms, his theory proposed that towns with lowest level of specialization would be equally spaced and surrounded by hexagonally shaped hinter lands. Although, empirical testing of this theory is doubtful yet it is relevance

for location of a manufacturing industry in a special case where production trends to be centralized and the market is a really extended.

The major limitation of this theory is that it fails to encompass the development of belts of industrial concentration and the agglomerative tendencies which are common features of the modern industrial structure.

Renner's Theory:

The objective of Renner was to develop some general principles concerning industrial location. He classified industry into four categories: 'extractive', 'reproductive', 'fabricative', and 'facilitative'. To undertake any one of the these six ingredients are required: raw material, market, labour and management, power, capital and transportation. Keeping in mind these ingredients, Ranner postulated the law of location for fabricative (i.e. manufacturing) industry according to which any manufacturing industry trends to locate at a point which provides optimum access to its ingredients. It will, therefore, locate near to:

(a) Raw Materials, if it uses perishable or highly condensable raw substances; or

(b) Market, where the processing adds fragility, perishability, weight, or bulk to the raw materials, or where its products are subject to rapid changes in style, design, or technological character; or

(c) Power, where the mechanical energy costs of processing are the chief items in the total cost; or

(d) Labour, where its wages to skilled workers are a large item in the total cost.

Renner's approach on industrial location is quite realistic as it tries to bring together the major determinants for that. However, he has not been able to go into deep in analyzing the effects of spatial cost variation and industrial symbiosis, i.e. agglomeration on industrial location. He merely describes the tendencies of industrial location based on these factors.

Rawstron's Principles :

Location decisions will be important with stable technology.

Other Geographical Approaches :

The basic objectives of all these authors was to establish the relationship between city size and industrial structure. Such relationship could be used to infer about the patterns of industrial location in urban areas of various sizes.

Model Question :

1. What do you mean by industrial location ?
2. Briefly explain the economic and infra-structural factors .
3. What is the central place theory?
4. Write short note on Rawstrou's principles.
5. Explain the economic theory of location.

THE ECONOMIC THEORIES OF LOCATION

Learning Objectives:

After studying this unit, you should be able to

- **Explain the Weber's theory of location.**
- **Discuss the Split location.**
- **Analyses the Sargant Florance theory.**
- **Describe the factors influencing location.**
- **Discuss the Losch theory.**

2.1 WEBER'S THEORY OF INDUSTRIAL LOCATION (THE PURE THEORY)

Alfred Weber, a German economist, enunciated a systematic theory of industrial location in 1909. Weber's theory of location is purely deductive in its approach. He analyzed the factors that determine the location of industry and classified these factors into two divisions.

These are:

(i) Primary causes of regional distribution of industry (regional factors)

(ii) Secondary causes (agglomerative and deglomerative factors) that are responsible for redistribution of industry.

Primary Causes (Regional Factors)

According to Weber, transport costs and labour costs are the two regional factors on which his pure theory is based. Assuming that there are no other factors

that influence the distribution of industry, except transportation costs. Then it is clear that the location of industry will be pulled to those locations which have the lowest transportation costs.

The key factors that determine transportation costs are

(i) the weight to be transported and

(ii) the distance to be covered.

Weber lists some more factors which influence the transportation costs such as – (a) the type of transportation system and the extent of its use, (b) the nature of the region and kinds of roads, (c) the nature of goods themselves, i.e., the qualities which, besides weight, determine the facility of transportation.

However, the location of the place of production must be determined in relation to the place of consumption and to the most advantageously located material deposits. Thus, 'locational figures' are created. These locational figures depends upon (a) the type of material deposits and (b) the nature of transformation into products.

Weber classifies and calls those raw materials, which are available practically everywhere as 'ubiquities' (like brick-clay, water, etc) and 'localised' (like iron-ore, minerals, wood, etc) which are available only in certain regions. It is clear that localized materials play a more important role on the industry than the ubiquities. Further, regarding the nature of the transformation of materials into products, Weber categorized the raw materials as 'pure' and 'weight losing'. Pure materials impart their total weight to the products (eg. cotton, wool, etc) and the materials are said to be 'weight losing' if only a part enters into the product (eg. wood, coal, etc.). Hence, the location of industries using weight-losing materials is drawn towards their deposits and that of industries using pure-materials towards the consumption centres.

Weber further examines the cause of deviation of industrial location from the centres of least transport costs. The existence of differences in labour costs leads an industry to deviate from the optimal point of transport orientation. Geographical distribution of the population would give rise to differences in wages for labour. Naturally, the transport oriented location of an industry is drawn out and attracted towards the cheaper labour centres. Such migration of an industry from a point of minimum transport costs to a cheaper labour centre may be likely to occur only

where the savings in the cost of labour are larger than the additional costs of transport which it ought to incur.

(iii) Secondary Causes (Agglomerative and Deglomerative Factors)

An agglomerative factor is an advantage or a cheapening of production or marketing which results from the fact that production is carried on at one place. A deglomerative factor is a cheapening of production which results from the decentralization of production i.e., production in more than one place. To some extent these agglomerative and deglomerative factors also contribute to local accumulation and distribution of industry. These factors will operate only within the general framework formed by the two regional factors, i.e., costs of transportation and costs of labour. The advantages which could be derived in this context are external economies. The pulls which the agglomerative factors possess to attract an industry to a particular point are mainly dependent on two factors. Firstly, on 'the index of manufacture' (the proportion of manufacturing costs to the total weight of the product) and secondly, on the 'locational weight' (the total weight to be transported during all the stages of production). To deduce a general principle, Weber uses the concept of "co-efficient of manufacture" which is the ratio of manufacturing cost to locational weight. Agglomeration is encouraged with high co-efficient of manufacture and deglomeration with low co-efficient of manufacture and these tendencies are inherent in their nature.

Locational Coupling:

Weber also conceived the advantages of setting up different types of industries in the same locality. The production of quite different articles may be combined in one plant because several raw materials may diverge from a common source. This may be either due to technical or economic reasons: for instance, certain chemical industries, garments factories which manufacture over-coats, shawls, blouses, etc. Locational coupling may also occur due to connection through materials. If the by-product of an industry happens to be the raw material of another industry, then the two industries may select a single place of location. For instance, the dye-stuff industry is connected with other industries using coke, because coal tar (upon which the dye-stuff industry is based) is a by-product of the burning coke.

Criticisms:

Weber's theory of location has been criticized on various grounds which may be summarized as follows:

1. Weber has been criticized for his unrealistic approach and deductive reasoning. According to Sargant Florence, vague generalizations cannot provide suitable solutions to the theory of location as non-economic considerations will also influence which are not mentioned in the pure theory. He says that Weber's theory fails to explain locations resulting from historical and social forces.

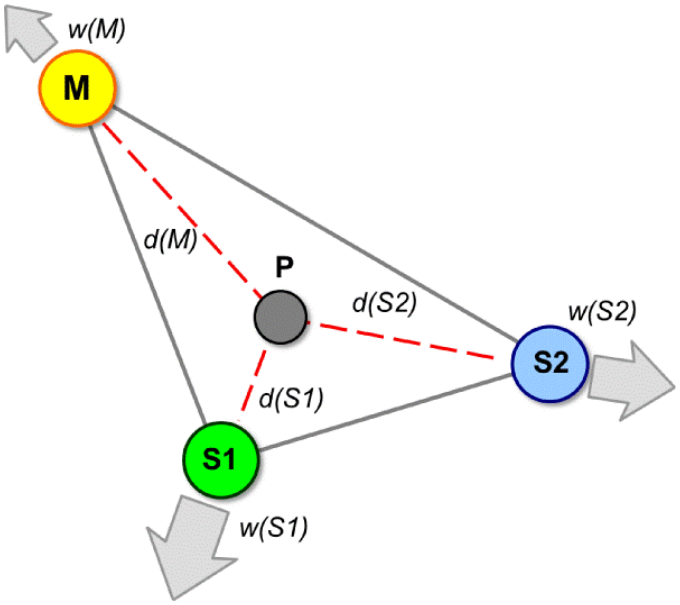
2. A. Predohl criticizes Weber's theory as more a selective theory than a deductive theory. The very distinction between primary and secondary is itself artificial, illogical and arbitrary.

3. Weber assumes fixed labour centres and unlimited supplies of labour which are unrealistic. The rise of industry may create new labour centres and we cannot assume unlimited labour supplies at any centre.

4. In a competitive market structure, the assumption of fixed points of consumption is unrealistic. Country-wise scattering, usually, of consuming public is a reality and there may be a shift in the consuming centres with a shift in industrial population.

5. A. Robinson also considers Weber's division of raw materials into 'ubiquities' and 'localised' as artificial.

Weber's deductive theory of location, in spite of the shortcomings, is the only theory which has been enjoying the universal acceptance and application, as all the other alternative suggestions are neither complete nor comprehensive.



Weber's Location Triangle

Alfred Weber's work (1909) is considered to have established the foundations of modern location theories. One of his core assumption is that firms will chose a location in view to minimize their costs. This involves a set of simplifications, namely that location takes place in an isolated region (no external influences) composed of one market, that space is isotropic (no variations in transport costs except a simple function of distance) and that markets are located in a specific number of centers. Those conditions are quite similar to those behind Von Thunen's agricultural land use model elaborated almost one hundred years earlier. The model also assumes perfect competition, implying a high number of firms and customers, small firm sizes (to prevent disruptions created by monopolies and oligopolies) and a perfect knowledge of market conditions, both for the buyers and suppliers. Several natural resources such are water are ubiquitous (available everywhere) while many production inputs such as labor, fuel and minerals are available at specific locations.

According to Weber, three main factors influence industrial location; transport costs, labor costs and agglomeration economies. Location thus imply an optimal consideration of these factors. Solving Weber's location model often implies three stages; finding the least transport cost location and adjusting this location to consider labor costs and agglomeration economies. Transportation is the most important element of the model since other factors are considered to only have an adjustment effect. To solve this problem, Weber uses the **location**

triangle within which the optimal is located. The above figure illustrates the issue of minimizing transport costs. Considering a product of w(M) tons to be sold at market M, w(S1) and w(S2) tons of materials coming respectively from S1 and S2 are necessary. The problem resides in finding an optimal factory location P located at the respective distances of d(M), d(S1) and d(S2). Several methodologies can be used to solve this problem such as drawing an analogy to a system of weights and pulleys (Varignon's solution) or using trigonometry.

Another way preferred among geographers, particularly with GIS, is to use **cost surfaces** which are overlaid. Weber's location theory explains well the location of heavy industries, particularly from the industrial revolution until the mid twentieth century (the sector that Weber was looking at). Activities having a high level of use of raw materials tend to locate near supply sources, such as aluminum factories will locate near energy sources (electricity) or port sites. Activities using ubiquitous raw materials, such as water, tend to locate close to markets. To assess this issue, Weber developed a **material index** which is simply the weight of the inputs divided by the weight of the final product (output). If the material index is higher than 1, location tends to be toward material sources. If it is less than 1, location tends to be toward the market. Contemporary developments in manufacturing, the reduction of transport costs and new economic sectors (high technology) have changed locational behavior substantially, involving much less consideration to Weber's principles. Still, these principles apply well for industries with a very high material index.

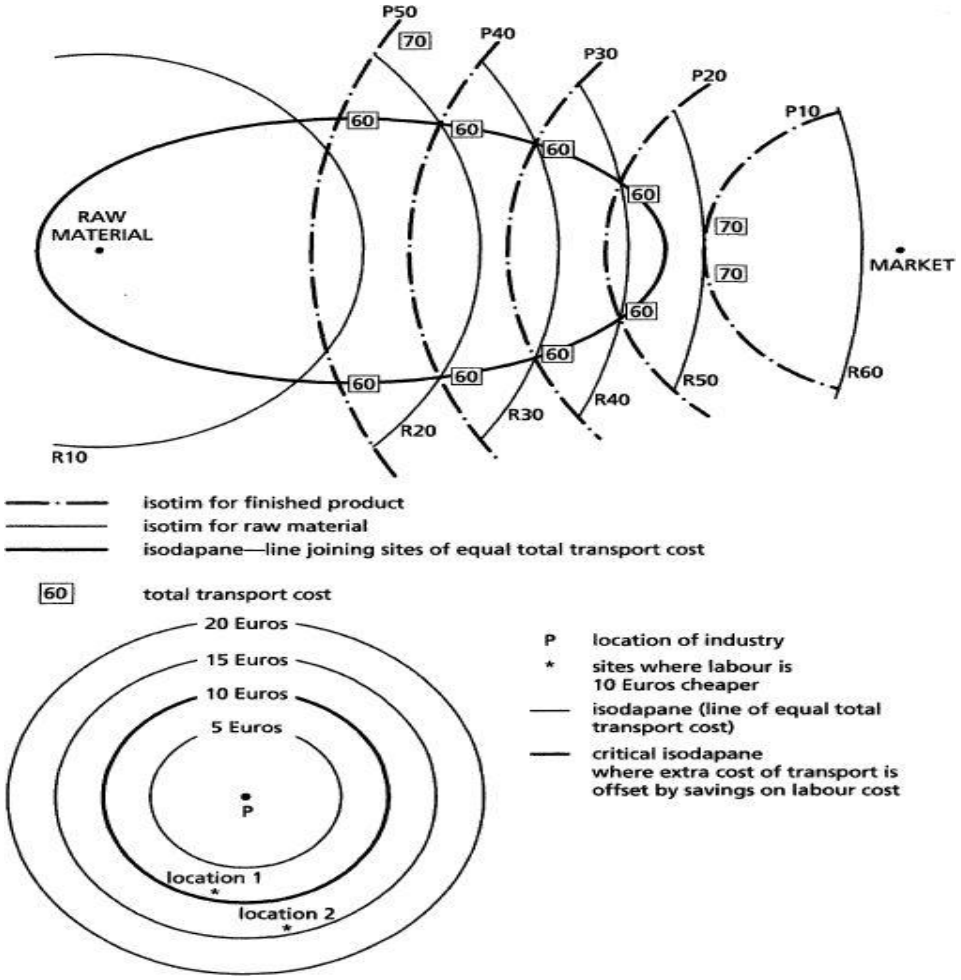
A model of industrial location proposed by A. Weber (1909, trans. 1929), which assumes that industrialists choose a least-cost location for the development of new industry. The theory is based on a number of assumptions, among them that markets are fixed at certain specific points, that transport costs are proportional to the weight of the goods and the distance covered by a raw material or a finished product, that perfect competition exists, and that decisions are made by economic man.

Weber postulated that raw materials and markets would exert a ‘pull’ on the location of an industry through transport costs. Industries with a high material index would be pulled towards the raw material. Industries with a low material index would be pulled towards the market.

Once a least-cost location has been established, Weber goes on to consider the deflecting effect of labour costs. To determine whether the savings provided by moving to a location of cheaper or more efficient labour would more than offset the

increase in transport costs, isodapanes are constructed around the point of production at the point of minimum transport costs. The extra price of the wage bill is calculated for the point of production. If the source of cheap labour lies within the isodapane which has the value of the higher wages differential (the critical isodapane), it would be more profitable to choose the site with low labour costs rather than the least transport costs location.

Industrial location may be swayed by agglomeration economies. The savings which would be made if, say, three firms were to locate together, are calculated for each plant. The isodapane with that value is drawn around the three least-cost locations. If these isodapanes overlap, it would be profitable for all three to locate together in the area of overlap.



Weber's theory of industrial location

Weber's theory of Industrial Location :

The first comprehensive effort at developing a theory of location was made by Alfred Weber in 1909 in his book Theory of the Location of Industries´. Weber's theory is to be considered as a deductive theory. And he emphasized the cost factors in affecting the location of industry. He assumed competitive pricing (a situation where individual firms were powerless to influence the price of their product which was the same everywhere).Therefore, according to him, to achieve the maximum profit, they had to minimize cost. It follows that a rational producer would choose a location where lowest costs were incurred. This is the reason why Weber's approach is known as the least cost approach to the theory of industrial location.

Weber classified the causes influencing industrial location into two categories:

a) Regional factors
b) Secondary causes

Regional Factors:

Weber points out three general regional factors of location.

They are:

*the relative price range of deposits of materials

*the costs of labor

The costs of transportation

By assuming that the influence of material cost can be reduced to that of transportation cost, only two regional factors, namely, transportation and labor costs remain. These two are termed as the primary causes of industrial location.

Secondary causes:

To the above primary causes, Weber adds two secondary causes:

They are:

Agglomerating factors

Degglomerating factors Agglomerating refers to an advantage or cheapening of production due to the concentration of industry. For instance, availability of external economies in the form of cheap availability of labor, finance at one place causes industry to µconcentrate¶ at one place. Degglomeration implies dispersal or decentralization of industry

One more interesting information, which we should learn that

Weber divides all raw materials into two groups, namely ubiquitous´ and³localized materials´. First one are those materials that are available everywhere, so they have very little influence on location. Localized materials are those that are available in certain areas only therefore excerpt an important influence on location.

Weber explained his theory interims of influence of each factor on industrial location. Thus, now let us consider the influence of following costs separate Lyon industrial location:

They are:

Transportation costs

Labor costs

Agglomeration

Degglomeration costs

Influence of Transportation Costs:

Weber shows the impact of transportation costs on location and then demonstrates how labour costs and agglomeration and degglomeration may change this situation. Assuming that transport cost is directly proportional to the distance covered and weight carried, Weber gives his famous locational triangle as shown in fig.1M and N are two material sources and C is the consumption centre. The entire weight of the material from M has to traverse a distance μa and material N a distance b to reach the point of location T. the weight of the product has to move the distance C to reach the consumption point. To determine where the location will actually lie, Weber calculates the ratio between the weight of localized material and the weight of the product. This, he designates as the material index. If the Index is less than one, the location is oriented towards the consumption centre, while if the index is greater than one, the location is material oriented. Sargent Florence's Inductive Analysis Sergeant Florence's mode of analysis is inductive in character.

On account of the very tangible results it yields regarding the trends of industrial distribution, Florence's analysis has acquired great popularity. Sargent Florence has introduced two new concepts in the theory of location, namely ³Location Factor´ and Co-efficient of Localization´

C**o-efficient of localization:**

Co-efficient of Localization measures the degree of geographical concentration of a given industry. Judging the extent of the industrial activity by labor inputs, the formula for the coefficient of localization can be written as

follows: The value of C varies from 0 to 1 and the relative magnitude of C characterizes the dispersal or localized nature of a given industry.

Split Location

Productive activities could be divided depending upon the nature of raw-materials, industry and market. Weber considers the location for an industry at more than one place, "Single location of production will be the exception and a split of production into several locations will be the rule for productive process which can technically be split'. Hence split location is only possible if the different stages of production can be technically carried on at different places independently. Weber says that the productive process need not entirely be performed at one set up at different locations. "The only cause which could lead to an actual split and to a resultant transfer of the parts of different locations would obviously be that some ton-miles would be saved in the process."

The problem of selecting the locations, in other words, the question of 'where' will fall again within the realm of Weber's analysis. The 'where' of the location of the first stage of production is the point of minimum costs of transportation of the minimum point of the first locational figures (ideal point between the place of the consumption and the most advantageously located material deposits). Similarly, the location of the second stage is the minimum point of the second figure. This split in location is advocated on the grounds that the first stage of production is mainly concerned with the elimination of waste materials and the second stage is one which requires pure raw materials for further processing and finishing, turned out by the first stage and several other materials in this stage, which are economically available at that place only. For these reasons, therefore, the first stage of production is near the raw material deposits and subsequent stages would be near the place of final consumption. An appropriate instance of split location would be the paper industry where the manufacture of pulp is carried on near the supplies of the raw materials and the second stage of paper manufacture near the consumption outlet.

Sargant Florene's Theory

Another theory of location which has assumed great practical importance and acquired a wide popularity during recent year is the one enunciated by Professor Sargant Florence. He felt that some of Weber's assumptions were not realistic. He was very critical about Weber's geographical aspect of location. He observed that the relation of an industry to an area is not so important as the relation of the industry to the distribution of the occupied population as a whole.

To establish a relationship between the population distribution and the distribution of the industry, he takes the occupational distribution of the population. In working out the statistical measures of the degree of localisation of different industries, he relied on the census of production. His theory is mainly an inductive analysis. Sargant Florence makes use of two new concepts in his theory to explain the existing locational pattern of an industry. They are 'location factor' and 'coefficient of localisation'.

'Location factor' refers to an index of the degree of concentration of an industry in a particular region. This index is calculated by taking two ratios, namely, the percentage of workers of the industry in question found in the region under consideration and the percentage of all industrial workers found in that particular region to the total industrial workers in the country. The first one is to be divided by the second one to find out the location factor. If the quotient is one, the location factor is said to be unity. It implies that the industry is evenly distributed over the whole country. If the location factor is above unity, the region is supposed to have a higher slice of the industry than what is legitimately due to it. If the location factor is less than unity, it implies that the region does not have a sufficient share of the industry. Location factor is generally calculated for the regions, based on the political divisions of a country, as division of the country into industrial zones, though scientific, is not feasible.

Coefficient of localisation indicates the propensity of an industry for concentration. Coefficient of localisation is to be calculated as follows:

1. The percentage of all workers found in each region is to be calculated.
2. The percentage of the workers of the industry in question in each region is to be found out.
3. The positive deviations of (2) from (1) are to be added up.

4. The sum thus derived is to be divided by 100.
5. The result will be co-efficient of localisation.

On the basis of coefficient of localisation, all industries of a country could be divided into three categories: high, medium, and low coefficient industries. The main object of finding the concept of coefficient of location is to classify industries according to their qualities of dispersion or concentration. Industries with high coefficient as in the case of those which are predominantly localised near the source of raw material, show very little tendency to get dispersed. On the other hand, industries with low coefficient can thrive in any region and as such have a greater propensity to disperse.

Criticism

1. The theory could not be considered as an independent flawless theory of location as the indices provided by Florence can only reveal the existing state of industrial distribution in a country.
2. The theory is incapable of explaining the causes responsible for the choice of location.
3. The coefficient of localisation given by Florence could not the be the same for all the countries as the pattern of distribution of workers in each country varies according to local conditions.
4. Florence takes the number of workers as a basis for the calculation of the location factor and the coefficient of localisation.
5. This theory also fails to take into account the various forces of concentration or dispersion.
6. The Theory is able to be modified in terms of costs rather than merely in terms of technical factors.
7. The coefficient of localisation helps the Government in deciding upon the types of industries that are amenable to dispersion under a scheme of regionalism.

Factors Influencing Location

Maximisation of profit is the most important goal in their choice of particular places for the location of industries. Profit maximisation necessarily implies cost-minimisation as a consideration of decisive importance. An entrepreneur, therefore, has to bestow careful thought in deciding location of industrial units.

Factors influencing the location :

1. **Availability of raw materials**:

In determining the location of an industry, nearness to sources of raw materials is a vital consideration. For most of the major industries, the cost of raw materials from the bulk of the total cost.

The sugar industry provides another illustration of location near the sources of raw materials. In other words, most of the agro-based and forest-based industries are to be located in the vicinity of the sources of raw material supply.

2. Labour:

Adequate supply of cheap and skilled labour is necessary for an industry. The attraction of an industry towards labour centres depends on the ratio of labour cost to tech total cost of production which Weber calls 'Labour cost of Index'. But modern economists would not agree with Weber. Non-availability of local labour is not likely to prevent a site which has great natural advantages for locating an industry.

Industries are at liberty to tap labour supply from other areas. Further, the fact that labour can be obtained at lower wage rates has lost much of its importance in the modern days because of Minimum Wages Act and the social security measures. But on this basis, we should not ignore this factor.

Low labour costs in centres like Bangalore, Coimbatore, Madurai, Ujjain, Agra, etc., attracted the industry from centres of high wage costs like Bombay, Ahmedabad, Delhi and Kanpur. Even in the Iron and Steel industry at Jamshedpur, labour played a vital role in the initial days of its establishment.

3. **Proximity to Markets:**

Industries producing for a local market are also drawn towards market. Industries located near the markets could be able to reduce the costs of transport in distributing the finished product as in the case of bread and bakery, ice, tins, cans, drums manufacturing, etc.

Accessibility of markets is more important in the case of industries manufacturing consumer goods rather than producer goods, since they require adjustments constantly with the changes in the habits of the consumers.

In the process of dispersal of industrial activity, evolution of new markets is relatively an important factor. The cotton textile mills in the up-country centres, and the jute industry in Uttar Pradesh, Bihar and Tamil Nadu provide illustrations of location near markets.

4. **Transport Facilities:**

Transport facilities, generally, influence the location of industry. The question of locating plants may be resolved into a balancing of the transport advantages of nearness to the deposits of raw materials and nearness to the markets. "For each combinations of material sources and market there must be a point or points at which the total transportation costs involved in assembling materials and delivering the product to the market are less than they would be anywhere else. In the absence of production cost differentials, the best location for the production process is at the point of minimum transport costs." The transportation with its three modes, i.e., water, road, and rail collectively plays an important role. So the junction points of water-ways, roadways and railways become humming centres of industrial activity.

Further, the modes and rates of transport and transport policy of Government considerably affect the location of industrial units. In the location of cement industry transport relations of a centre in regard to raw materials, markets and power are the dominating factors. Therefore, cement industry has a tendency to be attracted at the point of minimum transport costs in relation to raw materials, markets and power.

5. Power:

The source of energy for turning the wheels of industry have had a vital decisive influence in the location of industrial units because an industry needs cheap power. Water, wind, coal, gas, oil and electricity are the chief sources of power. Both water and wind power were widely sought at sources of power supply before the invention of stream engine. In the initial days of industrial evolution, industrial units used to depend upon coal, since coal being a bulky and weight-losing material cannot bear high transport costs.

Therefore, it exercised a dominating pull on the location of the industries. During the nineteenth century, nearness ot coal-fields became the principal locating influence on the setting up of new industries, particularly, for heavy industries. But with the introduction of other sources of power (like electricity, gas, oil, etc.) the power factor became more flexible. The recent development of hydro-electric power with high tension lines to transmit electric power to industrial centres is likely to minimise the importance of power as a significant factor in industrial

location. After the completion of the Pykara hydro-electric project in South India, the industrial wave got momentum especially in the districts of Coimbatore, Madurai, and Thiruneveli by taking advantage of the new source of power. The pattern of locational distribution of most of the industries has a considerably changed with the development of hydro-electricity.

6. Site and Services:

Existence of public utility services, cheapness of the value of the site, amenities attached to a particular site like level of ground, the nature of vegetation and location of allied activities influence the location of an industry to a certain extent. In view of the above, Government of India has launched the scheme of developing 'Industrial Estates' to accelerate and to disperse industrial activity over a wider area in the country. The main aim of providing Industrial Estates is to encourage backward regions which are not industrially developed. In view of the emphasis laid down by the Government on the backward regions development, some places were classified as backward areas where the entrepreneurs would be granted various incentives like subsidies, or provision of finance at concessional interest, or supply of power at cheaper rates and provision of education and training facilities. Some entrepreneurs induced by such incentives may come forward to locate their units in such areas.

7. Finance

Finance is required for the setting up of an industry, for its running, and also at the time of its expansion. The availability of capital at cheap rates of interests and inadequate amounts is a dominating factor influencing industrial location.

For instance, a review of locational history of Indian cotton textile industry indicates that concentration of the industry in an around Bombay in the early days was mainly due to the presence of rich and enterprising Parsi and Bhatia merchants, who supplied vast financial resources.

8. Natural and Climatic Consideration:

Natural and climatic considerations include the level of ground, topography of a region, water facilities, drainage facilities, disposal of waste products, etc. These factors sometimes influence the location of industries.

In case of extractive industries like iron ore, coal, bauxite, etc., their availability is limited to the place where they are found and hence those industries are also located within fairly narrow limits conditioned by the nature.

9. Personal Factor:

In deciding location of industrial units, sometimes an entrepreneur may have personal preferences and prejudices against certain localities. "Mr. Ford started and prejudices against certain localities.

10. Strategic Considerations:

In modern times, strategic considerations are playing a vital role in determining industrial location. During war-time a safe location is assuming special significance. This is because in times of war the main targets of air attacks would be armament and ammunition factories and industries supplying other commodities which are required for war. From this point of view, such industries should be dispersed to various centres, far off from the borders so as to render the enemy air attacks on these industries of key and strategic importance unimaginable and futile. The Russian experience during the Second World War provides an interesting example.

11. External Economies:

External economies also exert considerable influence on the location of industries. External economies could also be enjoyed when a large number of industrial units in the same industry were located in close proximity to one another.

12. Miscellaneous Factors:

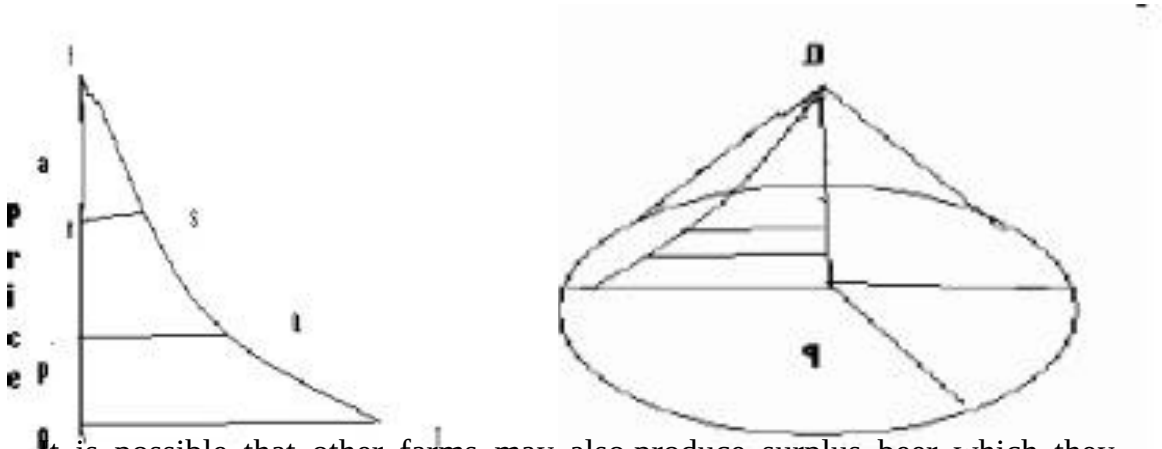
Historical accidents also play a dominating role in determining the location of industries in certain cases. Further the size of an industrial unit would also have much influence in choosing location. This is because the size of industrial units depends upon the radius of the circle within which they can profitably distribute their goods and upon the density of population living within the circle.

Losch theory

August Losch's Theory:

We are aware that Weber theory concentrated only on supply and cost considerations and leaving out demand completely. In contrary to it, Losch theory tended to neglect supply almost to the extent that Weber had neglected demand. In his theory, therefore, Losch tried to incorporate demand by considering the size of the market and maintained that the best location would be that which would command the largest market area since this would bring in the highest sales revenue. Losch assumes an isotropic plane, that is a homogeneous land surface with an evenly distributed population of self-sufficient farm households each having the same tastes and similar technical capabilities; in short, a surface from which all irregularities and non economic factors have been abstracted. He further assumes identical production, identical demand curves for each buyer of each product, and that transportation cost are proportional to distance. In such a situation, the shape and size of market area will depend on the price of the product and the rate of transport cost.

To take an illustration, let us consider the example given by Losch. Suppose there is a farmer who produces beer over and above his requirements. If OP is the price at the fig.



It is possible that other farms may also produce surplus beer which they would like to sell in the market. As long as profits are made, new breweries will come to be established, each brewery having a circular market area. As the number of breweries increase the circular areas touch other but even now the whole space is not covered, and some area remains unnerved the only possibility by which the total area can be covered is through overlapping circles in the former cases, firms will continue to be set up to serve the unnerved market while in the latter, consumers in the shaded region will choose a centre that is nearest to them and leave others. Ultimately hexagons of the shapes are formed. The hexagonal form is the most efficient one since among all the possibilities of utilizing the corners; the hexagon retains the most of the advantages of the circle. Each product will have a different

network of market areas. When we considered different products each having its own network of market area, we can see the emergence of an economic region or landscape.

Summary

The theory of industrial location attempts to explain answers for three important questions. They are; Why the industries are located where they are, Why the locationsare shifted, And what can be the best location for a particular industry keeping in view the resource endowments of different regions, transport network, existing demand, potential demand etc, The first comprehensive effort at developing a theory of location was made by Alfred Weber. Weber's theory is to be considered as a deductive theory. And he emphasized the cost factors in affecting the location of industry. He assumed competitive pricing (a situation where individual firms were powerless to influence the price of their product which was the same everywhere). Therefore, according to him, to achieve the maximum profit, they had to minimize cost. It follows that a rational producer would choose a location where lowest costs were incurred. This is the reason why Weber's approach is known as the least cost approach to the theory of industrial location. Sergeant Florence's mode of analysis is inductive in character. On account of the very tangible results it yields regarding the trends of industrial distribution, Florence's analysis has acquired great popularity. Sargent Florence has introduced two new concepts in the theory of location, namely [3]Location Factor´ and Co-efficient of Localization´ August Losch tried to incorporate demand by considering the size of the market and maintained that the best location would be that which would command the largest market area since this would bring in the highest sales revenue.

Industrial location trends in India

Recent Trends in the Location of Industries:

The traditional factors like nearness of sources of raw materials, motive power, nearness of markets, labor supply etc have no longer remained the effective pulling forces in the location of industries. The location trends have changed substantially due to the development of substitute raw materials, network of electrification and transportation by roads and railway, mobility of the labor and persuasive and compulsive policies of the government for balanced regional development.

The recent trends in the selection of industrial location can be described as under:

Priority for the suburban areas

The industrialists show their preference for the suburban area as the site for establishment of a new unit or relocation of the existing one. The industrial policy of the government does not permit the establishment of a new unit or expansion of an existing one in city areas. At the same time infrastructure facilities are developed in the suburban areas.

Industrial development in the notified backward areas

In order to have balanced regional development, the Central Government as well as the State Government has notified certain backward areas Different types of incentives like cash subsidy, tax relief, financial assistance with low interest rates, cheaper land and power supply etc are provided. So, many such areas have been developed substantially in the recent times.

Establishment of Industrial estate

Industrial estate is a piece of vast land sub-divided into different industrial plots wherein factory sheds are constructed. The Government of India has planned a national policy for the development of industrial estates. It assigned the responsibility of the development of industrial estates to State Governments. In each state, the State Development Corporation (SDC) has developed many industrial estates practically in all the districts of the state. Industrial estates have also been developed by private entrepreneurs and Chambers of Commerce. The plots of land along with factory sheds and infrastructure facilities are developed in the industrial estates and are sold to the prospective promoters. The establishment of industrial estates has greatly affected the location of industries.

Decentralization of industries

Under the conscious industrial policy of the Government, concentration of industrial units is prevented through licensing policy. New units are not permitted to be started in certain industrially congested areas. Similarly, existing units either establish their additional plants in a less developed area or sometimes relocate the whole unit in such areas.

Increased role of the Government in the decision of location of industries

Government through its persuasive and compulsive methods greatly influences the location decision in recent times. It provides certain attractive incentives to the promoters to establish their units in less developed areas, at the same time it does not permit excessive industrialization in certain developed areas.

Competition between Government and institutions

As industry provides job opportunities to the local population, many local organizations attempt to tempt the prospective promoters to establish the units in their areas. They provide different types of incentives like cheap land, relief in local taxes etc. Sometimes the objective of local organizations and the government comes in conflict on the issues of location of industries. Thus, the whole pattern of decision about the location of industries has undergone substantial changes in recent times.

Model question :

1. Briefly explain the Weber's theory of location.
2. What are the criticism of weber's theory of location ?
3. Write short note on Losch theory.
4. What is Split location ?
5. Describe the sargant florance theory.
6. Describe the factors influencing location**.**
7. Discuss the Recent Trends in the Location of Industries

UNIT III
INDUSTRIAL PRODUCTIVITY

Learning Objectives:

- ✓ **Analyses the industrial productivity.**
- ✓ **Explain the Measurement of Productivity.**
- ✓ **Describe the Scope and significance of productivity.**

- ✓ **State the tools of productivity.**
- ✓ **Explain the factors influencing industrial productivity.**

Industrial Productivity:

The rate of economic growth is reflected in the increase of output of goods and services of a nation over a given period. In the process of economic growth, production and productivity are the two significant elements. The link between productivity and economic growth is almost self-evident. A net addition to the total national product and acceleration of economic growth will obviously result, if the same production factors are employed efficiently. In other words, increase in productivity in an industry is an essential factor for stepping up of the rate of economic growth.

Productivity drive has a great role to play in increasing the production per unit of input and thereby augmenting national income. A growing economy must achieve a surplus in this was to be done at any cost. The problem is really of increasing the output consistently with less than proportionate increase in the costs of production. In other words, mere increase in production is not a satisfactory criterion for measuring economic growth. Increase in production must be accompanied by a reduction in the cost of production of every additional unit. This means securing higher productivity. Hence, productivity drive is essential in the economic planning of underdeveloped countries which suffer from inadequacy of capital, raw material and skilled manpower.

The concept of productivity has been explained by various authors and authorities in different terms. Ewan Claugue says that 'Productivity' is a word which we use broadly to express the overall efficiency with which our industries perform. This definition, though appeals to us depicting the nature of productivity, makes it impossible to express 'productivity' in us depicting the nature of productivity, makes it impossible to express 'productivity' in quantitative terms to be of any use. Overall efficiency embraces all the factors of production and measuring all the dissimilar factors of production in one group is impracticable.

Russel W.Fenske defines the term 'Productivity' in five ways. They are: (i) Productivity is a form of efficiency. (ii) Productivity is the utilization of resources or effectiveness of utilization of resources: (iii) Productivity is a ratio (rather than a phenomenon): (iv) Productivity is a measure of some kind (rather than a variable requiring measurement): (v) Productivity is a rate of return (primarily in monetary terms).

J.M.S. Risk defines "Productivity" as follows: "Productivity is a physical ratio; it relates to the quality of goods produced or services given in comparison with the quantity of resources consumed." The variety of resources consumed, namely, human effort, use of

machinery and use of raw material, etc., when converted into money terms, he argued, 'still represented all the physical factors. But it is felt in some quarters that this definition could not be taken to measure to exchange rate. Application of exchange rates for comparison of different periods, of different products and of different places becomes cumbersome.

Economists and statisticians do not have consensus as to the precise definition of the concept of productivity. But all had agreed to the meaning of productivity given by the International Labour Office. According to it, "the ratio between output and one of the factors of input is generally known as productivity of the factor considered." Thus productivity means the ratio between output and any of the factors of production – land, labour, capital and organization. But the International Labour Organisation (ILO) opined that in as much as the interest most often centered round the relationship of production and labour, the word 'productivity' always referred to output in relation to labour. Hence, the ILO has defined the productivity of labour as "the ratio of output of the corresponding input of labour". Though there is a difficulty in arriving at the homogeneity of data concerning labour due to difference in skills, energy, training, environment incentives and rates of pay, etc., this ratio of output to labour is universally acknowledged to have some uniformity subject to those limitations mentioned and probable adjustments in actual working out of the productivity in quantitative terms. But the fundamental theoretical objection remains the same that all the factors o production. i.e., land, labour, capital and organization were not utilized in measuring productivity in the definition, though all of them have combined influence on total production. Hence, productivity should be defined taking all of them into consideration. It may be defined as a practical measurement relating to the total output of any one of the measurable factors of production, in a ratio, preferring the scarce or predominant nature of the factor input. In other words, common basis for comparing two variables must be ensured to avoid distortions in analysis after practical computations are over. In practice, however, aiming at using all the factors of production which are so different in their magnitude is virtually impossible.

Measurement of Productivity

As we have already known that productivity is generally expressed as the ratio between output and input, symbolically it may be expressed as follows:

$$Productivity = \frac{Net\ Output}{Effort\ input}$$

If productivity is to be calculated as a ratio between output and labour, symbolically it may be expressed as:

$$Labour\ Productivity = \frac{Net\ output}{Number\ of\ workers\ or\ number\ of\ man-hours}$$

If productivity is to be calculated as a rati between output and capital, symbolically it may be expressed as:

$$Capital\ Productivity = \frac{Net\ output}{Net\ capital\ exployed}$$

Usually labour is selected as the unit of input factor for various reasons in calculating productivity. In any country labour force is one of the most important resources. When output per worker is increasing, the country's economy would show improvements in national income (production).

Further, all other factors of production are subject to laws of mechanics, i.e., their output increases in a more or less fixed proportion to their input. Thus, in various countries, including India, productivity is measured as a ratio between output and labour.

Some Problems of Productivity Measurement: There are certain limitations in the measurement of industrial productivity.

1. It is not possible to measure productivity of services industries like banking, insurance, etc, as the output cannot be directly measurable in terms of physical units.
2. If the finished products are homogeneous in nature, measurement of productivity is easier. But it is somewhat difficult to compute productivity of certain industries producing heterogeneous goods like chemicals, engineering, electric and glass industries.
3. The difficulty involved in the measurement of output is of a technical character. "Output is usually conceived as the volume of completed or finished product and little attention is paid to the work-in-progress which is just as much as the result of application of input factor, as the completed product.
4. It is not possible to take into account many invisible and intangible outputs or associated services which may have no bearing on current production while measuring productivity, as in the case of maintenance of scientific and industrial research laboratories, market research bureaus, etc.
5. Though labour productivity is the most important in measuring industrial productivity, it lacks certain measure of precision and clarity. The question arises whether the labour productivity should be worked out on the basis of man-hours worked or total number of workers employed. The use of both these concepts of

labour suffers from some defects. The man-hours concept does not take into account the qualitative differences in the character and composition of labour. If we take the number of workers employed for the purpose, it is difficult to fix any specific weights for all the categories of labour.

6. The compilation of international comparison is highly complicated and a very difficult task. They are subject to more details of limitations and qualifying conditions under which they are compiled. The difficulty in selecting a suitable yardstick for measuring productivity is the cause for such a situation. In certain countries the real net product per man-hour worked is taken as a yardstick. But the depreciation for national stock of capital is not statistically measurable.

In certain countries productivity of capital is taken. In the intervening periods of comparison the price changes will come up and they are to be eliminated. The exchange rates that are fixed in the periods of comparison do not reveal the relative changes over time.

Scope and significance of productivity

Scope and Significance

Since productivity indicates the magnitude of change in the economic activity, its scope encompasses all the facets of economic welfare. From cost centres to countries, productivity reflects the rate of energy of production. The macro-economic aspect of average productivity implies international indicators of productivity for comparison and remedial action at appropriate level: and the micro-economic aspect of productivity permeates consideration of various industries in a country including inter-industrial, inter-regional, inter-departmental, etc.

The productivity indices have been used for a variety of objectives at different levels of economic activity. At the national level productivity indices have been used subjective and scientific measures for forecasting the trends in the major sectors of the country's economy and in the appraisal of economic conditions and prospects. They have often been characterized as barometers of 'benchmarks' of the country's economic and

industrial advancement, and have been extensively used both by economic historians and analytical statisticians for the inductive and historical study of such abstractions like economic development, growth and process.

On the national level, productivity indices are also used for estimating the measurement of protection to be granted to an industry or product against internal or external competition; the formulation of appropriate taxation and fiscal policies and in the extension of social insurance and labour welfare schemes.

Productivity indices, at this level, would assist in analyzing and forecasting the economic trends; in evaluating the influence of technological changes on the volume of production and employment; and in allocating the natural, financial and human resources which would maximize the national welfare.

As the inter-regional level, the productivity indices reveal the differences in effectiveness of production between two regions in terms of output, when similar products are produced. Preference for alternative locations can be studied and locational policy is considerably influenced by the analytical study of inter-regional productivity indices. These indices are one of the useful tools used for economic analysis by policy-makers in formulating regional's policy, dispersal of industries, etc. Further, productivity indices at department level, at plant level, and / or at job level help in evaluating the effectiveness of the various schemes of rationalization and scientific management. They would help in finding out the overall improvement of the unit, whether the introduction of a new labour-saving device or new wage system has led to a significant increase or decrease in the productivity of labour or other input factor. The indices also serve as guidelines for future planning of production.

The degree of excellence achieved by the different countries in technical and industrial accomplishments is suggested by respective country's productivity data when compared on an international level. This international study suggests the competitive efficiency in the economic growth of the respective countries and their potentialities in capturing foreign markets.

Tools of Productivity

Tools of Productivity

The following are the tools of industrial productivity:

1. Use of scientific management technique and practice;
2. Work, Time and Motion studies for scientifically determining better and quicker ways of doing a job;

3. Developing better human relations including the modern concept of industrial relations between the employer and employee;
4. Provision of wage and bonus incentives, adoption of collective bargaining, management-workers' consultations, workers' participation in management, training of workers and labour welfare schemes;
5. Adoption of standardization, specialization and simplification programmers in the methods of production;
6. Adoption of control techniques (including production and planning control), cost control, and quality control at each level;
7. Improvements in working conditions, material handling and plant layout; and Selection and training of the personnel at the various levels of management.

Factors Influencing Industrial productivity

Factors Influencing Industrial Productivity

An increase in industrial productivity from time to time or from region to region is a result of certain factors. The factors influencing industrial productivity are so numerous, complex and inextricably interwoven that the task of evaluating the influence of each individual factor on the overall productivity of industrial units is best with almost inseparable difficulties.

Some of the factors that determine the level of industrial productivity can be briefly summarized as follows:

Technical:

Technological innovations play a vital role in affecting industrial productivity. The increase in productivity, due to various factors other than undesirable hard work, may be termed as technological progress. "The application of motive power and mechanical improvements to the process of production has accelerated the pace of industrialization to an unprecedented degree, and has given us the version of the vast and unexplored frontiers that still lie ahead of us in the realm of applied science and technology. The most dominant factors that have contributed to the spectacular advances in the industrial productivity are the application of mechanical power, introduction of highly specialized and semi-automatic and automatic machines, improvements in the production process, more efficient coordination and integration of productive processes, and the greater degree of specialization both of work and output.

Quality of Labour Force:

The skill, experience, qualifications, intensity of work, etc., of the worker has a dominating pull in influencing thin level of industrial productivity. It is the skilled labour force that has been a major contributing factor in the transformation of static past into the dynamic present, with its ramifications for the future that holds promise and prosperity for human well-being. In times of peace as well as war, the might of a nation undoubtedly depends upon the inherent qualities of its labour force. There is a correlation between the standard of living of a nation and the skill that the country's labour force can acquire. No spectacular gains in the industrial progress have been made in most of the underdeveloped countries due to lack of proper facilities necessary for the upkeep of body and mind of the labour force. Further, wage payment, working conditions, work-places, the degree of mechanization of work and specialization, material used in production, tools supplied, the innate ability of the worker, etc., exercise an important influence on labour productivity which has a great impact in determining the industrial productivity.

Financial:

The productivity increases due to technological innovations. But it is difficult to adopt such innovations in the absence of adequate financial facilities. In other words, industrial productivity is subjected to technological improvements and innovations to a certain extent and the adoption of such measures is conditioned by the availability of sufficient financial resources. Where the capitals relatively abundant and the supply of labour is comparatively scarce, the movement for mechanization would accelerate industrial productivity.

Size of the Industrial Unit :

Some economists have pointed out that the increase in productivity is not the measure of technical progress and hard work waged by the labour alone, but also economics of large scale. When other factors like technology, labour, etc., remain at the same level, large-scale unit is at an advantageous position in obtaining the supplies of raw material at lower prices. Further, the large-sized unit can derive advantages of specialization of managerial ability, in utilizing plant and machinery, securing greater economies in the marketing of finished product and in utilising the by-products, and in raising the required finance. Generally, large units spend substantial sums of money on scientific, technical and marketing research which leads to a greater productivity.

Natural :

The natural factors like physical, geographical and climatic variations exercise greater influence on the industrial productivity in any country. However, the relative

importance of the aforesaid factors depends upon the nature and character of the industry, the extent of control on the physical conditions and the type of output. "The geological and physical factors play a very dominant role in determining the productivity of extractive industries likes coal-mining in which the physical output per head is greatly influenced by the depth of coal-mines, the thickness of the coal seams, the topography of the region and the quality of coal available in other industries like tailoring, grain-milling, hosiery, soap-making, confectionary, medium and coarse cotton manufacturing, etc., the geographical, geological and physical factors exercise little influence on productivity." Further, in the case of agricultural industries, climate and geographical factors play a vital role in determining industrial productivity.

Managerial :

Managerial factors have come to play a very dominating role in determining the relative productivity of different industrial units, with the growing complexity of the productive system. With the growth of giant enterprises the responsibility of management has enormously increased.

Under the present system of industrial production, management has to perform a wide variety of functions, i.e., decision-making, laying down policy, organizing, planning, directing, controlling, staffing, coordinating, getting goods produced, and selling. Primarily, manager's job is to increase productivity, which is the key to prosperity. For doing this manager has to take decisions in different fields of management which determine the future course of action for the organization over the short run and long run. If the manager commits any mistake while taking decisions or in discharging any one of the responsibilities, productivity of the unit would be affected. It has been rightly said that "never before in the history of industrial development was there a great need of energetic, enterprising, foresighted managerial talents imbued with the spirit of adventure of qualities of judgment, imagination and vigilance, as is today; for the individual units are destined to sink or swim with those who guide and govern their destinies.

Socio-economic Factors:

Generally, the influence of socio-economic factors in determining the industrial productivity is indirect. If the existing economic and social institutions are not conducive to improvements, it would be pretty difficult to anticipate substantial gains in industrial productivity, even in the presence of adequate amount of raw material and abundant supply of technical know-how.

The socio-economic factors such as the role of decision-making capacity of the individuals or group of individuals, property rights, consumer's sovereignty, living

conditions, standard of living of the people, family system, religion, willingness to save, etc., many stimulate or damper the urge for higher industrial productivity.

Further the psychological attitude and behavior of the investors, employers, workers, and consumers, their resilience to accept new innovations and products, and the values that guide and govern their philosophies of and daily conduct and influence, and the attitude towards community, may assist or retard productivity.

Government Policies:

Mostly industrial policies and decisions will be influenced by the Government policies such as taxation, tariff, financial and administrative policies. Certain industries may be granted protection; incentives may be given to certain industries for their development in view of national interest by the Government.

The anti-trust policy or restrictions on industrial combinations by the Government would create favorable conditions for healthy competition which exercise considerable influence in determining the trends in the industrial productivity.

The administrative and financial policies of the Government may also play a vital role in creating favorable atmosphere for saving, investment and flow of capital from one industry or sector of production to another which will influence directly or indirectly the trends in industrial productivity.

Model Question:

1. Describe the analyses the industrial productivity.
2. Briefly explain the Measurement of Productivity.
3. Write note on the Scope and significance of productivity.
4. What are the tools of productivity?
5. Explain the factors influencing industrial productivity.

Labour productivity

After studying this unit, you should be able to

- **Discuss the labour productivity.**
- **State the concept of labour productivity and measurement.**
- **Explain the productivity movement in india.**
- **Analyse the guidelines of the productivity.**
- **Describe the national productivity council.**

Introduction:

Labour is an important and, in fact, indispensable factor of production. A business firm employs workers to do several types of jobs. Some of them are required to man the plant and machinery of the firm, some do manual works where use of machines is not possible or it is uneconomical. Apart from workers, the firm would be employing persons to manage its offices, to guard its properties and for several other such works. Thus, the use of labour will be quite prevalent in its business operations whether it is production of goods or services or trading or any other thing.

Without labour we may not be able to do the business and run the industries at all. A hundred per cent automation of any firm is rather impossible. At least one man would be required to press the button if the firm uses computers to control operations of its business. Even in such situation it may be possible to produce goods and services using automatic plants but for sale of goods in markets, running of its offices and security purposes it has to employ manpower.

Labour is thus, an unavoidable input. Considering the importance of labour input, it will be quite natural for a firm to lay emphasis on its efficient utilization. The firm spends money on employment of labour. It will ensure that the gain from such employment is maximum.

Concept of Labour Productivity and Its Measurement

Productivity, in general, is define as a ratio of what comes out of a business to what goes into the business, i.e. it is the ratio of 'outcome' to the efforts of the business. Let us say that the outcome of a business can be expressed in terms of value of goods produced by the firm during a specified period and the efforts can be expressed in terms of total value of inputs required for that.

The Productivity would then be the value of goods divided by the value of inputs. It will be a measure of 'total factor productivity' of the firm. If we take a specific input in the denominator to compute the productivity, we will then get a different type of productivity ratio. Say, total output in physical or value terms divided by the value or physical units of capital would be giving us 'capital productivity' and similarly, if labour is used in the denominator then it would be called 'labour productivity'. In both these rations the total output of all factors of production. E.g. land, labour and capital etc., is attributed to ne single factor of production L capital in the case of 'capital productivity' and to labour in the case of 'labour productivity'. Thus, the ratios do not reflect the contribution of one

factor alone but something more than that. They are used as surrogate ratios for the total factor productivity or industrial efficiency of the firm.

Sometimes labour productivity is also defined as a ratio of labour input (i.e. man-hours) to output and an increase in labour productivity means a reduction in this input. This is in fact, inverse of the ratio of output to labour. The choice of the ratio to define labour productivity whether by output /labour ratio or labour /output/ratio or labour/ouptur ratio is the matter conversion, but both will be used for same interpretation ie. An increase in output/labour ratio or a decrease in labour/output ratio means an increase in labour productivity.

The labour productivity and the capital productivity as we have defined above are average ratios. Analytically, however, we may define them in terms of marginal ratio. i.e. the ratio of increase in output to the increase in labour input over a period will be called as 'marginal product' of labour and the ratio of increase in output to the increase in capital input will be called marginal product of capital.

It is given on labour productivity than capital productivity. This is because output per man-hour is the easiest basis for comparison. Further, machines and material inputs by themselves do not produce anything. It is the man who uses them to produce anything. It is the man who use them to produce something; so having more emphasis on labour productivity by the firm is natural course of action.

The Determinants of Labour Productivity

Normally, we find differences in labour productivity of individual workers or firms or industries. There will be several factors responsible for such differences. Some will be objective factors like tools, equipment, machinery and other facilities with which workers cooperate to produce some output, while other factors will be concerned with the personal attributes or qualities of workers and management. In this section, we will discuss all such factors under a few general categories. The categories are : (1) the capital endowment of labour; (ii) the quality of labour; (iii) the organization of work; (iv) the quality of raw materials; (v) hours of work; (vi) methods of payment and incentives for work; (vii) quality of management, and (viii) proper industrial climate.

The Capital Endowment of Labour

Capital is another important factor of production like labour. It is a sum of all kinds of heterogeneous physical goods like tools, equipment, machines, land and buildings, etc., which are used repeatedly for longer period in production of goods and services. A worker needs tools and equipment to do his job. Without such things his productivity will be very low or he may not produce at all. If he is given better tools, and machines, he can

work faster and thus produce a larger volume of output in a given period. There may be several jobs which could be performed by machines only. Through use of machines one can produce not only a larger volume of output but the quality of output can be maintained at some reasonable standard. If an employer is interested in maximization of the productivity of labour he would be employing more and more capital equipment so long as he gets a positive increment in productivity per man-hour. He may be substituting labour by capital in doing so or by keeping the amount of labour constant and increasing the amount of capital for production. What he will be doing about the combination of labour and capital inputs depends on the nature of technology. In some lines of production it is possible to use more and more capital in place of labour and thus increase the degree of automation. There may be situations in production when the two inputs are to be increased in fixed proportion, that is, increase in capital means increase in labour. Whether output of these inputs will also increase in the same proportion or more or less than that is governed by the laws of returns to scale 9see Chapter 6). If labour is substituted by capital then there may be a decrease in labour cast but it may lead to an increase and sometimes a wasteful expenditure on capital.

Suppose a firm employs one more unit of capital in production. This will increase the total cost of production. This increase will be the marginal cost of capital (MCc).The increased employment of capital would generate some output which means an increase in total revenue of the firm. The additional revenue accruing to the firm would be called 'marginal revenue product of capital (MRPc)'. Similarly, if the firm employs one more unit of labour, its cost of production would go up. This increment in total cost would be defined as marginal cost of labour (MC_1)'. Which factor –capital or labour-should the firm actually employ? This we can find by comparing the ratios of Marginal Revenue Product to Marginal Cost for both the inputs. It will be economical to employ more capital in place of labour if

$$\frac{MRP_C}{MC_C} > \frac{MRP_L}{MC_L}$$

This means one unit of expenditure if made on capital brings more revenue to the firm than the unit expenditure of money on labour input. The best proportion of these two inputs would be the one for which

$$\frac{MRP_C}{MC_C} = \frac{MRP_L}{MC_L} = \frac{MRP}{MC}$$

This shows that the firm would be having maximum efficiency, i.e. least cost of production when marginal revenue product per rupee expenditure is same for all inputs.

The amount of labour and its proper proportion with the best tools and machines for the job is not the all required to increase labour productivity. The quality of labour force matters very much in this regard. If the workers are trained and educated properly such that they have talents and skills to do the jobs, the productivity will certainly be enhanced by this. Apart from skills, physical and mental health, morale, motivations and attitudes to work contribute significantly in productivity of labour input. Some workers will be lazy and slow in work, so they will produce less output as compared to the output of the smart and fast workers. Similary, we can't expect more output from sick and mentally depressed workers.

The development of necessary skills and educational qualifications for jobs is the concern of individual workers or employees. The whole manpower policy would be guided by the elements like

(i) to maintain strict conformity with relevant public policy
(ii) to attempt to use highest skills and aptitudes of all workers
(iii) to assure opportunity for personal development
(iv) to facilitate individual satisfaction in work
(v) to encourage personal identification with organizational goals
(vi) to assure the competence of leadership
(vii) to maximize quality of individual contributions
(viii) to provide a high level of economic security, and
(ix) to maintain employment stability.

With all such elements of manpower policy of the firm, it may be quite possible to maintain the morale, spirit, and quality of workers at the most desired level in order to have maximum productivity form them.

Should then we take it for granted that the labour productivity of the firm would be at maximum level? The answer is 'no' because it depends on how the firm organizes its production activities. Various types of production activities are to be linked together in a systematic way. The managers of the firm would be doing this job. They have to assign work to individual workers and keep watch over their progresses in production. If it is done scientifically, say for example, following the principle of specialization or division of labour, the productivity of the firm is bound to go up. As we have mentioned in Chapter 6, division of labour provides advantages of

A. increase in the dexterity of every worker,
B. saving of time which is lost in moving from one job to another, and also of equipment and tools, and
C. Facilitates invention of greater number of specialized machines.

As a result of all such advantages of the division of labour, workers do their jobs with greater speed and so productivity increases. Each job requires different skill and different personal qualities such as physical strength, endurance, concentration, etc.

The quality of material used in production is obviously an important determinant of labour productivity. A worker can produce not only more but products of good quality if he is given better set of raw materials. Take the example of spinning of cotton yarn. The rate of spinning will be certainly high if long fibred cotton is used for this purpose. The productivity of a farmer would be quite high if the soil of his land is fertile.

The length of working day is a crucial variable on which the productivity of labour force depends. A worker may produce a certain quantity of output in 4 hours but a different quantity in 8 hours. Longer the length of working day more we expect the output of the workers. However, the working day more we expect the output of the workers. However, the relationship between volume of output and the length of working day need not be a linear one. If it is linear, that is, output is directly proportional to the number of hours worked then the entrepreneurs would prefer the longest possible working day or week for their workers. In practice, we find some limit on the length of the working day, say 6 hours a day or 8 hours a day, depending on the nature of the work. How to find such limit of working hours a day? In other words, We should determine the optimum length of the working day? Two things are to be considered simultaneously for this. First, the rate of output produced by workers in the successive hours and the cost of production. The rate of output changes with the increase in working time in a predictable way. Initially it will be slow as it takes time to set up the machines and work speed, but after some time the speed of work may go up leading thereby to an increase in the rate of output which will eventually be declining with increase in working time due to fatigue of the labour force. Human body is not a machine. It cannot work continuously at the same speed of work. The body requires rest after certain period of work of given intensity. The interval of rest grows more rapidly than the period of work, so labour productivity is bound to decline eventually by this.

There is no unique length of working day. It depends on the nature of jobs. Some observations in this regard are as following:

a) Working day will be shorter in the jobs where heavy muscular exertion or mental or nervous strain is involved.

b) Financial and other types of incentives may induce workers to work for longer span of time in a day.

c) Improved methods of work, better machines and skill of workers help in shortening working hours.

d) The general environment of work, i.e. noise, light, temperature, the degree of supervision, and the general state of human relations in the firm, affects the length of working day.

e) The optimum length of working time varies from person to person and place to place and from time to time.

Time Rates:

In this system, the earnings of workers and other employees are determined on the basis of the time spent at work rather than the output produced during that time. The rate of payment may be fixed on hourly or daily or weekly or monthly or yearly basis depending on the situation and the time pattern adopted by the firm. A majority of workers and other employees in organized sectors of an economy gets time rates of payment.

Merits:

It brings stability and uniformity in their earnings. A man's wage or salary is not, for example, affected by breakdown and other delays in work over which, he has no control. Under the system of time rates payment, workers enjoy their working time and do a sound craftsman-like job at a reasonable pace without being exhausted and tense. The use of workers' skills to produce quality goods rather than merely larger volume of output is the basic objective of the time rates of payment.

Demerits:

The most serious one is that time rates do not provide incentive to increase output. All workers in a grade are treated alike. The idle and inefficient workers contributing little in production are benefited much by the system while efficient and energetic workers are not rewarded adequately. It may be quite difficult to fix output standard for fixing wage levels under the system of time rates. If it based on the output of the poor workers, the firm merely gets back the output for which it pays. Better workers are not utilizing fully in this situation. If the loses its surplus as it pays too much to the poor workers. Greater the number of inefficient or idle workers on the payroll of the firm higher will be the labour cost of production apart from a lower level of labour productivity.

When the system of time rates is adopted the firms would normally be adopting some other ways to maintain higher levels of production for their workers. Output levels are fixed for the workers depending on the rates of payments, nature of job and the skill level of the worker. They have to complete their task-load during the time specified for that. Work measurement practices are rigorously followed by the firm. Efficient workers are given extra allowances in the form of merit bonus on the basis of their productivity. An

important way to keep productivity of workers at a satisfactory level is to introduce some kind of job insecurity for them. This is done by keeping workers on daily wage payrolls or 'temporary' for longer period of their service length. Such workers can be terminated any time through a proper procedure as defined under the labour laws; so the workers would be working hard and fast to maintain their jobs. For 'permanent' workers whose services cannot be terminated easily, there would be incentives like promotion chances and other benefits, so they would be working efficiently to achieve them. Normally, we find workers and other employees who are appointed on contract basis working very efficiently in order to keep their job commitments. Such practice is widely followed in the American system and perhaps it is one of the factors of high labour productivity in that country. In a country like ours, however, such practice is not followed as it has dangers of workers being exploited by the employers.

Making payment on time rates basis depends on certain conditions. It is suitable specifically in the following situations:

(i) Where speed of work is set by machines so that a standard rate of output can be maintained such as on an assembly line.

(ii) Where the quality of work is more important.

(iii) Where output is not proportional to the efforts involved such as in mining where difficult working conditions may halt work.

(iv) Where output cannot be measured such as services of watchman engineers, teachers and police personnel, etc.

Incentive Payments:

IN the straight piece-rate system, the earnings of a worker vary directly with his output subject to a minimum time rate.

(i) It adjusts the reward of a worker to his effort and allows him freedom to produce more or less as he likes.

(ii) Labour costs are minimized in this system and they are not so dependent on the speed of work.

(iii) Capacity utilization increases under this system as workers speed up their work. This reduces fixed cost of production.

(iv) Less supervision is needed since every worker uses his time in his job for extra money.

(v) The system enables the firm to detect inefficiencies in its work through systematic work study techniques which are to be adopted in order to implement the incentive system.

Bad quality of raw material may also slow down the rate of production, Disharmonious and tense conditions developed in the factory which are bad symptoms affecting the productivity of workers in the long-run. Greedy employers may fix it at a very high level making it difficult to be achieved by their workers. Trade unions, therefore, often look at the standards with suspicion and take them as means of workers' exploitation.

It is a process or function which is concerned with defining the aims and objectives of the organization; setting down policies, procedures, programmes and strategies to help in the achievement of the organizational aims and objectives; bringing together the various factors of production such as men, machines, materials and methods and making their best possible use; exercising control over the performance of the factors of production; and providing conditions under which the persons associated with the organization – owners, creditors employees, customers, and community in general, get maximum satisfaction.

In brief, 'management' is a function of planning, organizing, staffing, coordinating, directing and controlling the activities of the organization. From the point of view of efficiency of the organization, the managerial functions are to be performed in a most efficient way. There will be a team of officers whom we call 'managers' who will be performing the task of management not only in production but also in every other aspects of the business such as financing, marketing, and personals, etc. A good management itself is a big incentive for increase in labour productivity. Good decision-making by the management and proper control of the activities of the workers and other employees of the organization are as important as the availability of good machines, good material and qualified and skilful workers for raising labour productivity.

A conductive industrial climate is very much essential for maintaining smooth flow of work in the organizations. Such 'climate' may be defined in terms of certain internal and external conditions which affect the working of the organizations directly or indirectly. The internal conditions, by and large, will be emerging from the faulty industrial relations system. An industrial relations system is a portrayal of employment relationships in the organization. The variables in terms of which the system can be specified are

(i) Employees and their organizations;
(ii) Managers and their organizations; and

(iii) Governmental agencies with responsibilities for working conditions and the work community.

Trade union activities constitute just one dimension of industrial climate. There will be several other external forces affecting it in some way or other. If the country's economy as a whole is passing through recessionary phase there would be a decline in industrial output because of slackening demand prospects. On the other hand, if there is inflationary trend prevailing in the economy then industries may be induced to produce more because of better sales prospects for their products.

Unemployment situation in the country, political stability, situations of capital markets, prospects for export, changes in government policies, demand and supply conditions for critical inputs like power and transport, and similar other factors will be exerting considerable impact on the industrial climate of a country.

All kinds of factors-technical, economic, social, personal and organizational – interact together to determine the productivity of labor force. It is, therefore, a very complex issue.

This chapter has been devoted on understanding the role and importance of labour productivity in the context of industrial economics. The topics covered in the discussion related to the importance of labour input, the concept of labour productivity and its measurement and identification of the general categories of factors which affect labour productivity of a business firm. Some empirical studies related to the subject have also been mentioned in brief. Labour productivity has several dimensions to study which are covered under different disciplines like industrial sociology, industrial psychology, industrial engineering, personnel management, etc., apart from economics. Keeping in mind the limited scope of this chapter, all such dimensions of labour productivity have not been explored in depth. We have covered only the basic material in order to have a general understanding of the subject in the context of industrial efficiency.

PRODUCTIVITY MOVEMENT IN INDIA

Though the developing countries differ in many respects, for instance in regard to the size of population, its density, the nature and the character of political system, the capacity to absorb social change, economic potentiality and income levels, they make for a common purpose in their determined bid to modernize the society and ensure minimum levels of livelihood to the people. The need to achieve these goals is immediate, but the prospect of achieving them is neither obvious, nor readily feasible. The performance of the

Indian economy since the country adopted the process of planned economic development has been very satisfactory.

The Indian planners, on the eve of the First Five Year Plan, realized that the key to solving problems of India's poverty lines in raising the levels of productivity. It has been reiterated in the subsequent Plans also, the significant advances in the economy are not possible without maximum economy in the utilization of scarce resources.

Government of India invited a team of experts from International Labour Organization "to show how productivity and earnings of workers in Indian textile and engineering industries can be raised by application in selected plants of modern techniques of Works Study and Plant Organization, and in addition where appropriate by the introduction of suitable systems of payment by results."

This Productivity Mission had taken up work in 1952. There were two teams, one for textile industry and another for engineering industry. These teams in their findings assert that improvement in productivity was possible with the existing staff in the industry provided adequate training and supervision and other facilities such as adequate machine maintenance procedures, flexibility of allocating duties, etc., were provided. Among other things the Productivity Mission pointed out the need to set up a National Productivity Centre in India to coordinate future field of raising productivity of Indian industries and to assist rapid industrialization of the country as envisaged in Five Year Plans.

The productivity movement wave got great momentum in India after the submission of the Report in March 1957 by the Indian Productivity Delegation to Japan. The Delegation, under the Chairmanship of Dr. Vikram A. Sarabhai, was requested to study the constitution, the organization, the programmed of work, and the mode of operation of the Japan Productivity Centre. Further, the Delegation was asked to recommend the steps necessary to establish in India, works of similar nature on a continuing basis, and for an Indian counterpart of the Japan Productivity Centre and the European Productivity Council. The Delegation visited Japan in October-November 1956 to observe the procedures adopted for increasing the productivity.

The Delegation specially studied large-scale industries in Japan like iron and steel, engineering, chemicals and textiles. In its Report, the Delegation emphasized that "In the context of ambitious targets for industrial production in the Second Five Year Plan, increase of productivity could play an important role by streamlining operations and by motivating the personnel working in industry to produce more goods of quality than now." The Delegation strongly recommended for the establishment of a non-official body known as National productivity Council with representatives on it of employers, labour, technical experts, research workers, technical consultants and the Government.

The activities of the National Productivity Council (NPC) should be

(i) the creation of a climate for increased productivity;

(ii) the channelizing of financial aid from national and international sources; and

(iii) the provision of specialist technical assistance which would be required as a result of the successful generation of the consciousness for augmented productivity. Further, the Delegation recommended for the establishment of local productivity councils on the model of the NPC.

(iv) The Delegation also recommended the convening of a seminar on productivity wherein a scheme for the establishment of the NPC could be worked out.

Accordingly, under the auspices of Union Ministry of Commerce and Industry, a seminar was conducted on November 2 1957. The Seminar was represented by various interests connected to industry. Inaugurating the Seminar, Sri Manubhai Shah said, with the increase of productivity more capital becomes available for investment in new plants and products, thereby enabling expansion of employment. The improvement in the standard of living increases the demand for services and for recreational and educational facilities. The increase in productivity, thus, generates expansion and establishment of additional factories, creation of demand for additional services and requirements and consequent creation of additional jobs and the expansion of employment. This is what we in India can envisage to be the eventual result of the productivity drive." The Seminar emphasized the need for productivity drive throughout the country and also suggested that the functioning of the National Productivity Council and local productivity councils should be unfettered and independent while serving the industrial areas to which they belong. The overall responsibility of NPC and LPCs would be to spread their activities to the entire economic development. With a view to make the productivity drive successful, the Seminar emphasized the following principles:

1. The main objective in the productivity drive should be to increase production and improve quality, use of modern techniques which aim at fuller utilization of the available factors of production raising the standards of living of the people and improving the working conditions of labour;

2. The wrong notion that modern techniques will result in redundancy should be dispelled and proper measures taken to obviate any unemployment. Increased productivity in a developing economy should ultimately help in increasing employment opportunities;

3. Benefits of increased productivity should be equitably distributed among capital, labour and consumers;
4. Productivity drive in the industrial sector should cover all the large, medium and small industries whether they are in the public or private sector; and
5. To secure unconditional support of employers, workers, Government and other interests for the successful productivity drive, it is necessary to encourage joint consultations, workers' participation in management and promotion of mutual understanding between management and labour in each industry and in each individual enterprise.

Guidelines for Efficiency/Productivity

The following are the guidelines for efficiency and productivity agreements as per the National Board for Prices and Incomes

1. It should be shown that the workers are contributing towards the achievement of constantly rising levels of efficiency. Where appropriate, major changes in working practice of working methods should be specified in the agreement.

The objective of efficiency agreements is to make possible the constant raising of efficiency; this will require close and continuing cooperation between managements and workers so as to achieve and maintain the highest standards in the use of both equipment and manpower. The second sentence has special reference to agreements which specify major changes in working practice to which workers have agreed. Such changes should always be spelled out if there is any possibility that commitments in more general terms will lead to difficulties of interpretation or will not be given full expression in practice.

2. Measurements of efficiency should be based on the application of relevant indices of performance of work standards.

Managements should devise and use appropriate yardsticks for measuring the contribution of workers of all kinds towards achieving rising levels of efficiency and develop an information system which makes full use of the data obtained as a result. For many manual operations, work-studied standards are applicable and should be used, but work measurement can also be applied to a wide range of clerical and other non-manual work. For other workers in other situations is will be necessary to use more broadly-based indicators of performance, if necessary on a group basis.

3. A realistic calculation of all the relevant costs of the agreements and of the gains attributable to the workers' contribution should normally show that the effect is to reduce the total cost of output or the cost of providing a given service.

'Relevant costs' may include, for example, the cost of redundancy payments or a proportion of consultants' fees where they are an integral part of an agreements and these should be apportioned as necessary over a reasonable period rather than charged only to the first year following the agreement. The 'gains attributable to the workers' contribution may result from more effective working methods, fuller utilization of existing capital equipment, the adaptation of working practices to enable full and prompt use to be made of new equipment and reduce capital investment (if for example revised scheduling and shift working make possible a smaller transport fleet). The reference to a reduction in costs assumes a calculation for the purpose of which unrelated costs, *e.g.,* the price of raw materials, are left out of account.

4. There should be effective controls to ensure that projected increases in efficiency are achieved and that higher pay or other improvements are made only when such increases are assured.

In order to observe this guideline, managements must operate effective controls, including an information system which makes it possible to estimate in advance and subsequently monitor the extent to which increases in efficiency are in fact being achieved. In so far as the information system shows that progress exceeds or falls short of the original projection, some adjustment may need to be made. In any case due allowance should be made for the accrual of some of the achieved gain to the consumer. Particular care also needs to be taken to distinguish the contribution of workers from other sources of more efficient working.

5. There should be clear benefits to the consumer by way of a contribution to stable or lower prices.

This guideline is of particular importance in areas of rapid economic expansion, since the most needs to be made of opportunities to reduce prices in these areas in order to contribute as much as possible to raising the real incomes of the community as a whole. In some cases the community may benefit by an improvement in quality while prices remain unchanged or by the use of the gains to compete more effectively in export markets.

6. An agreement applying to one group of workers only should bear the cost of consequential increases to other groups, if any have to be granted.

An example would be if supervisors have to be given a pay increase to prevent the disappearance of a differential as a result of a pay increase granted to the workers whom they supervise. The need for consequential increases unrelated to increases in efficiency should, however, be reduced as much as possible by enabling other groups of workers to

conclude their own efficiency agreements or by including them within the scope of the original agreement.

7. Negotiators should avoid setting levels of pay or conditions which might have undesirable repercussions elsewhere.

Where large increases in pay are shown to be justified negotiators should consider the possibility of staggering the increases over a period of time or, alternatively, of a non-recurring lump sum payment. Failure to do so might raise expectations for future increases which could not be fulfilled and also because of the exceptional size of the increases have repercussions which would eventually rebound on the undertaking granting the original increase.

National Productivity Council:

Consequent to the deliberations of the Seminar, the National Productivity Council was established in the year 1958. It was registered under the Societies Registration Act, 1860. The NPC is an autonomous organization, The constitution of the NPC provides that its membership should be limited to 60, and the number of representatives should be eleven each from employers' associations, workers' unions and Government departments. The remaining members have to be co-opted by these representatives from amongst other interests like technicians, scholars, consultants, consumers and local productivity councils. The NPC has a Governing Body of twenty members which elects one amongst them as Chairman. The President of the NPC is the Minister for Industrial Development. The organization chart of the NPC is shown on the next page.

At its first meeting which was held in March 1958, the NPC adopted at eight-point programmed. This programmed aims at the following:

1. Stimulation and promotion of productivity-consciousness by dissemination of information relating to productivity;
2. Providing training in productivity techniques and processes for all levels of management.
3. Provision of specialist services, if demand emanates from the local productivity councils;
4. Encouraging inter plant visits which helps in exchanging views and experiences;
5. Undertaking extensive and intensive research in methodology of productivity;
6. Sponsoring visits of productivity teams to advanced countries to gather important information that helps to raise productivity;

7. Arranging productivity training abroad; and
8. Inviting foreign technicians and productivity experts for guiding and assisting various sectors of the Indian economy.

The NPC was entrusted with the task of stimulating and facilitating the formation of Local Productivity Councils (LPCs). So far 49 LPCs were established. The LPCs are all autonomous bodies. They muster the local talent and initiative to achieve the goal of raising the productivity of the country. Similar to NPC the membership of the LPC is tripartite in character. All LPCs must meet once in a year at national level to discuss relevant matters and problems.

The year 1966 was declared as 'India Productivity Year' to stimulate productivity movement. Top priority was given to organize coordination between management, workers and Government and to solve some of the problems facing the country in industrial fields.

Through the network of LPCs, India Productivity Year programmers were carried out and the message of need for higher productivity and the ways and means to achieve the same was transmitted through the breadth and width of the country. Other organizations like chambers of commerce, professional institutions, individual enterprises, trade unions, Universities and Government special organizations have collaborated with the programmed of the India Productivity Year 1966 to make it a success.

The importance of this productivity drive is reflected in the creation of Industrial Productivity Council for every industry and Productivity Cell for every firm in the country. This situation helps solving of problems peculiar to each industry and firm. The year 1982 was also observed as the Productivity Year.

At present the essence of productivity movement in India can be traced back to the achievement of NPC though there are other institutions like Indian Statistical Institute, Calcutta, Ahmadabad Textile Research Association, Ahmadabad, South India Textile Research Association, Coimbatore, Administrative Staff College, Hyderabad, Indian Institute of Technology, Kharagpur, Indian Standards Institution, Delhi, and Tata Institute of Social Sciences, Bombay etc. (These institutions along with others have various programmers of research and these programmers sufficiently assist productivity increase).

India is a member of Asian Productivity Organization with 13 other member countries. The Year 1970 was celebrated as 'Asian Productivity Year'. The objective of the Asian Productivity Year is 'Prosperity through Productivity'. India has produced a film on the topic and it has gained the appreciation of the public at all levels. As its share, India during 1970 has organized International Training Programme on Productivity

Measurement in New Delhi from 5th to 21st January. The Supervisory Development Scheme was launched on 1st May, 1970. The NPC had chalked out different field and promotional programmers' for different levels, viz., Management, Trade Unions, Professionals, Workers and Students, during the Asian Productive Year. The progress so far achieved and the future programmers' are periodically reviewed i n the publication of the NPC.

In recent years, the unions and managements had several productivity agreements in different organizations. The wages are also linked with productivity in some organizations. Productivity consciousness has been created among the workers and managers. They are being given productivity awards and incentives.

The NPC has been giving Productivity Awards every year. The LPCs are also encouraging industries by giving such awards. Thus, the NPC and LPCs have been striving hard to increase productivity in India.

The Indian Economy in the nineties is faced with a formidable challenge to maintain and accelerate the tempo of economic growth, to combat inflation and to meet the ever-rising demand of goods and services. At present, it enjoys the advantages of a high saving rate, a large reservoir of skill base and a substantial degree of self-reliance in goods and services. Productivity at this junction can play a pivotal role in achieving goals set-forth for the Ninth Five year Plan. Every year, several organizations in India, have been celebrating 'Productivity Weeks' or 'Productivity Months'. During the period of celebration, several activities are being taken up to improve productivity at all levels.

In conclusion, the productivity movement in India, though attained significant momentum in the right direction, the results are too poor to be adequate to the needs of the country's industrial development. This is evidenced by the fact that the labour productivity of the country is very low when compared to other Asian countries like Japan. India requires more researchers, more practical men replacing the present preachers.

National Productivity Council

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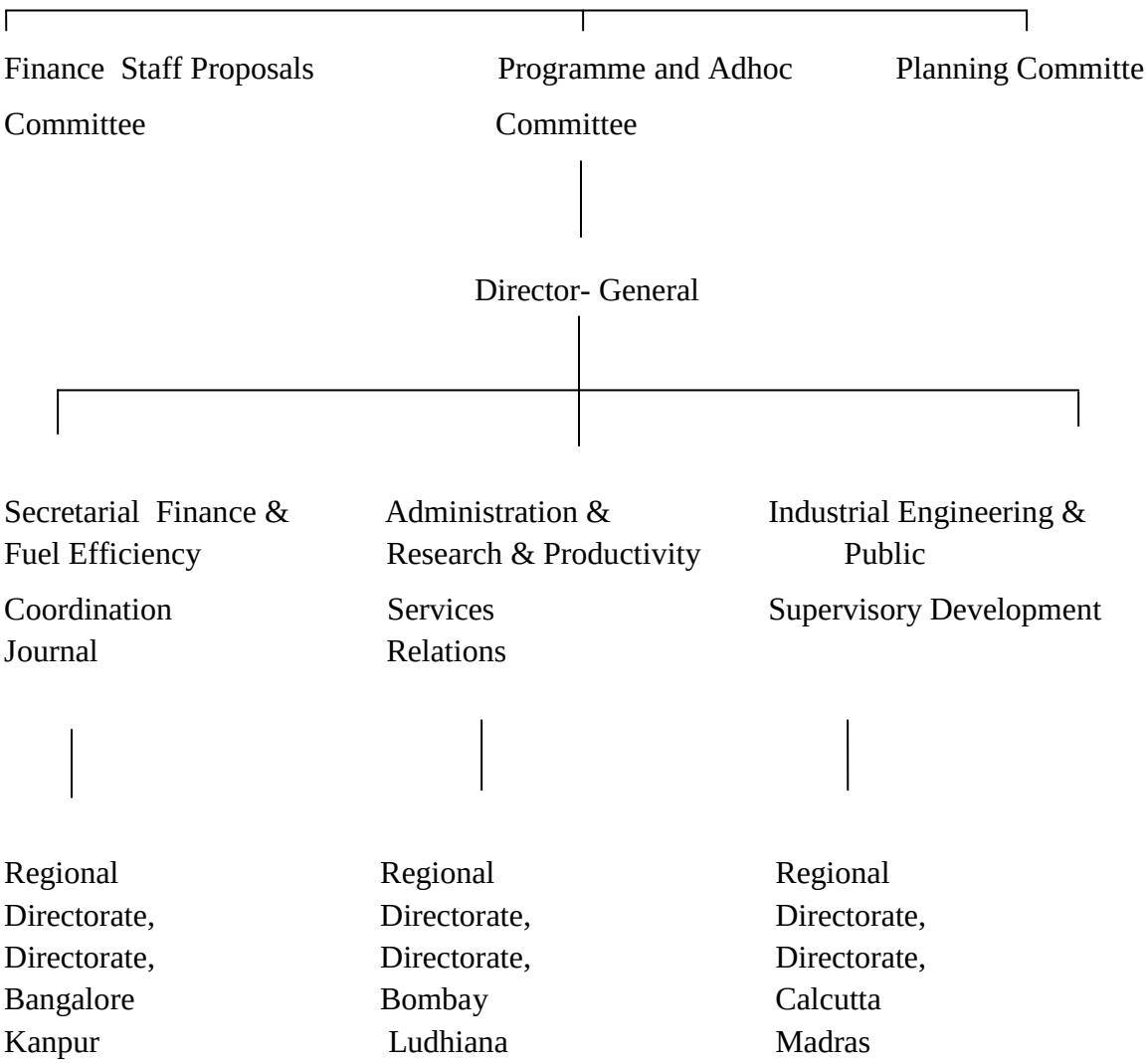
President

|

Governing Body

|

Chairman



49 Local Productive Councils

Model Question:

1. Explain – "Industrial productivity".
2. Discuss the concept of labour productivity.
3. Explain the productivity movement in India.
4. Analyses the guidelines for productivity.

5. Write short note on national productivity council.

6. What do you mean by labour productivity?

UNIT IV
Financial Ratio Analysis

Learning Objectives :

After studying this unit we should be able to

- **Explain the ratio analysis**
- **List out the categories of ratios .**
- **Describe the short term solvency ratio.**
- **Explain the profitability ratio.**
- **Classify the financial ratio.**

Ratio Analysis

Introduction :

Financial Statement viz., Balance sheet, the Income Statement, the Statement of Retained Earnings and the Statement of Changes in Financial Position, report what has actually happened to earnings during a specified period. We learnt how a balance sheet presents a summary of financial position of the company at a given point of time. The Statement of Retained earnings reconciles income earned during the year and any dividends distributed with the change in retained earnings between the start and end of the financial year under study. The statement of changes in financial position provides a summary of funds flow during the period of financial statements.

Ratio analysis is a very powerful analytical tool for measuring performance of an organization. The ratio analysis concentrates on the inter-relationship among the figures appearing in the aforementioned four financial statements. The ratio analysis helps the management to analyse the past performance of the firm and to make further projections. It allows interested parties like shareholders, investors, creditors, government and analysts to make an evaluation of certain aspects of a firm's performance.

Ratio analysis is a process of comparison of one figure against another, which make a ratio, and the appraisal of the ratios to make proper analysis about the strengths and weaknesses of the firm's operations. The calculation of ratios is a relatively easy and simple task but the proper analysis and interpretation of the ratios can be made only by the skilled analyst. While interpreting the financial information, the analyst has to be careful in limitations imposed by the accounting concepts and methods of valuation. Information of non-financial nature will also be taken into consideration before a meaningful analysis is made.

Ratio analysis is extremely helpful in providing valuable insight into a company's financial picture. Ratios normally pinpoint a business strengths and weakness in two ways:

- Ratios provide an easy way to compare today's performance with past.
- Ratios depict the areas in which a particular business is competitively advantaged or disadvantaged by comparing ratios to those of other businesses of the same size within the same industry.

CATEGORIES OF RATIOS

The ratio analysis is made under six broad categories as follows:

I. Long-term solvency ratios
II. Short-tem solvency ratios
III. Profitability ratios
IV. Activity ratios
V. Operating ratios
VI. Market test ratios

I. Long-term Solvency Ratios

The long-term financial stability of the firm may be considered as dependent upon its ability to meet all its liabilities, including those not current payable. The ratios which are important in measuring the long-term solvency is as follows:

- Debt-Equity Ratio
- Shareholders Equity Ratio
- Debt to Networth Ratio
- Capital Gearing Ratio
- Fixed Assets to Long-term Funds Ratio

- Proprietary Ratio
- Dividend Cover
- Interest Cover
- Debt Service Coverage Ratio

1. Debt-Equity Ratio

The two sources of capital are: shares and loans. It is quite likely for only shares to be issued when a company is formed, as loans are invariably raised at some later date. There are numerous reasons for issuing loan capital. For instance, the owners might want to increase their investment but avoid the risk which attaches to share capital, and they can do this by making a secured loan. Alternatively, management might requires additional finance which the shareholders are unwilling to supply, and so a loan is raised instead. In either case, the effect is to introduce an element of gearing or leverage into the capital structure of the company. There are numerous ways of measuring gearing but the debt-equity ratio is perhaps the most commonly used. It is calculated as:

$$\frac{\text{Long-term debt}}{\text{Share holders funds}}$$

This ratio indicates the relationship between loan funds and net worth of the company, which is known as gearing. If the proportion of debt to equity is low, a company is said to be low-geared, and vice versa. A debt equity ratio of 2:1 is the norm accepted by financial institutions for financing of projects. Higher debt-equity ratio may be permitted for highly capital intensive industries like petrochemicals, fertilizers, power, etc. The higher the gearing, the more volatile the return to the shareholders.

The use of debt capital has direct implications for the profit accruing to the ordinary shareholders, and expansion is often financed in this manner with the objective of increasing the shareholders' rate of return. This objective is achieved only if the rate earned on the additional funds raised exceeds that payable to the providers of the loan.

The shareholders of a highly geared company reap disproportionate benefits when earnings before interest and tax increase. This is because interest payable on a large proportion of total finance remains unchanged. The converse is also true, and a highly geared company is likely to find itself in severe financial difficulties if it suffers a succession of trading losses. It is not possible to specify an optimal level of gearing for

companies but, as a general rule, gearing should be low in those industries where demand is volatile and profits are subject to fluctuation.

A debt-equity ratio which shows a declining trend over the years is usually taken as a positive sign reflecting on increased cash accrual and debt repayment. In fact, one of the indicators of a unit turning sick is a rising debt-equity ratio. Usually in calculating the ratio, the preference share capital is excluded from debt, but if the ratio is to show effect of use of fixed interest sources on earnings available to the shareholders, then it is to be included. On the other hand, if the ratio is to examine financial solvency, then preference shares shall form part of the capital.

2. Shareholders Equity Ratio

The ratio is calculated as follows:

$$\frac{\text{Shareholders Equity}}{\text{Total assets (tangible)}}$$

It is assumed that larger the proportion of the shareholders' equity, the stronger is the financial position of the firm. This ratio will supplement the debt-equity ratio.Through this ratio, a relationship is established between the shareholders' funds and the total assets. Share holders funds represent equity and preference capital plus reserves and surplus fewer losses. A reduction in shareholder's equity signaling the over-dependence on outside sources for long-term financial needs and this carries the risk of higher levels of gearing. This ratio indicates the degree to which unsecured creditors are protected against loss in the event of liquidation.

3. Debt to Net Worth Ratio

This ratio is calculated as follows:

$$\frac{\text{Long-term debt}}{\text{Net worth}}$$

The ratio compares long-term debt to the net worth of the firm, i.e., the capital and free reserves less intangible assets. This ratio is finer than the debt-equity ratio and includes capital which is invested in fictitious assets like deferred expenditure and carried forward losses. This ratio would be of more interest to the contributories of long-term

finance to the firm, as the ratio gives a factual idea of the assets availability to meet the long-term liabilities.

4. Captial Gearing Ratio

It is the proportion of fixed interest bearing funds to equity shareholders funds:

$$\frac{\text{Fixed interest bearing funds}}{\text{Equity shareholder's funds}}$$

The fixed interest bearing funds include debentures, long-term loans and preference share capital. The equity shareholders funds include equity share capital, reserves and surplus. Capital gearing ratio indicates the degree of vulnerability of earnings available for equity shareholders. This ratio signals the firm which is operating on trading on changing the levels of fixed interest bearing funds in the organization.

5. Fixed Assets to Long-term Funds Ratio

It is the proportion of fixed assets to long-term funds:

$$\frac{\text{Fixed Assets}}{\text{Long-term funds}}$$

The ratio includes the proportion of long-term funds deployed in fixed assets. Fixed assets represents the gross fixed assets minus depreciation provided on this till the date of calculation. Long-term loans. A higher ratio indicates that safer funds are available in case of liquidation. It also indicates the proportion of long-term funds that is invested in working capital.

6. Proprietary Ratio

It express the relationship between net worth and total assets.

$$\frac{\text{Net worth}}{\text{Total Assets}}$$

Net worth = Equity Share Capital + Preference Share Capital + Fictitious Assets

Total Assets = Fixed Assets + Current Assets (Excluding fictitious assets)

Reserves earmarked specifically for a particular purpose should not be included in calculation of net worth. A high proprietary ratio is an indication of strong financial position of the business. The higher the ratio, the better it is.

7. Interest Cover

$$\frac{\text{Profit before interest, depreciation and tax}}{\text{Interest}}$$

The interest coverage ratio shows the number of times interest charges are covered by funds that are available for payment of interest. An interest cover of 2:1 is considered reasonable by financial institutions. A very high ratio indicates that the firm is conservative in using debt and a very low ratio indicates excessive use of debt.

8. Dividend Cover

$$\frac{\text{Net Profit after tax}}{\text{Dividend}}$$

This ratio indicates the number of times the dividends are covered by net profit. It highlights the amount retained by a company for financing of future operations.

9. Debt Service Coverage Ratio

It indicates whether the business is earning sufficient profits to pay not only the interest charges, but also the installments due to the 'principal' amount. It is calculates as:

$$\frac{\text{PRIT}}{\dfrac{\text{Interest + Periodic Loan Installment}}{\text{(1-Rate of Income Tax)}}}$$

where PRIT =Profit before interest and tax.

The greater the debt service coverage ratio, the better is the servicing ability or the organization.

II. Short-term Solvency Ratios

The short-term solvency ratios, which measure the liquidity and liability of the firm and its ability to meet its maturing short-term obligations. Liquidity is defined as the ability to realise value in money, the most liquid of assets. It refers to the ability to pay in cash, the obligations that are due.

The corporate liquidity has two dimensions, viz., quantitative and qualitative concepts. The quantitative concept includes the quantum, structure and utilisation of liquid assets, while according to the qualitative concept, it is the ability to meet all present and potential demands on cash from any source in a manner that minimizes cost and maximizes the value of the firm. Thus, corporate liquidity is a vital factor in business--excess liquidity, though a guarantor of solvency would reflect lower profitability, deterioration in managerial efficiency, increased speculation and unjustified expansion, extension of too liberal credit and dividend policies. Too little liquidity may lead to frustration of business objectives, reduced rate of return, business opportunity being missed and weakening of morale. The important ratios in measuring short-term solvency are:

1) Current Ratio
2) Quick Ratio
3) Absolute Liquid Ratio

1. Current Ratio

$$\frac{\text{Current Assets, Loans and Advances}}{\text{Current Liabilities and Provisions}}$$

This ratio measures the solvency of the company in the short-term. Current assets are those assets which can be converted into cash within a year. Current liabilities and provisions are those liabilities that are payable within a year. A current ratio 2:1 indicates a highly solvent position. A current ratio 1.33:1 is considered by banks as the minimum acceptable level for providing working capital finance. The constituents of the current assets are as important as the current assets themselves for evaluation of a company's solvency position. A very high current ratio will have adverse impact on the profitability of the organization. A high current ratio may be due to the piling up of inventory, inefficiency in collection of debtors, high balances in Cash and Bank Accounts without proper investment.

2. Quick Ratio or Liquid Ratio

$$\frac{\text{Current Assets, Loans \& Advances - Inventories}}{\text{Current Liabilities \& Provisions - Bank Overdraft}}$$

Quick ratio is used as measure of the company's ability to meet its current obligations. Since bank overdraft is secured by the inventories, the other current assets must be sufficient to meet other current liabilities. A quick ratio of 1:1 indicates highly solvent position. This ratio is also called acid test ratio, and serves as a supplement to the current ratio in analysing liquidity.

3. Absolute Liquid Ratio (Super Quick Ratio)

It is the ratio of absolute liquid assets to quick liabilities. However, for calculation purposes, it is taken as ratio of absolute liquid assets to current liabilities. Absolute liquid assets include cash in hand, cash at bank and short-term or temporary investments.

$$\frac{\text{Absolute Liquid Assets}}{\text{Current Liabilities}}$$

Absolute Liquid Assets = Cash in Hand + Cash at Bank + Short-term investments. The ideal absolute liquid ratio is taken as 1:2 or 0.5.

III. Activity Ratios or Turnover Ratios

Activity ratios measure the effectivity of the firm to employ its resources. These ratios are also called turnover ratios which involve comparison between the level of sales and investment in various accounts--inventories, debtors, fixed assets, etc. Activity ratios are used to measure the speed with which various accounts are converted into sales or cash. The following activity ratios are calculated for analysis:

1. Inventory

A considerable amount of a company's capital may be tied up in the financing of raw materials, work-in-progress and finished goods. It is important to ensure that the level of stocks is kept as low as possible and consistent with the need to fulfill customer's orders in time.

$$\text{Inventory Turnover Ratio} = \frac{\text{Cost of goods sold}}{\text{Average inventory}}$$

$$\frac{\text{Sales}}{}$$

$$= \frac{}{\text{Average Inventory}}$$

$$\text{Average Inventory} = \frac{\text{Opening stock + Closing stock}}{2}$$

The higher the stock turnover rate, the lower the stock turnover period, although the ratios will vary between companies. For example, the stock turnover rate in a food retailing company must be higher than the rate in a manufacturing concern. The level of inventory in a company may be assessed by the use of the inventory ratio, which measures how much has been tied up in inventory.

$$\text{Inventory Ratio} = \frac{\text{Inventory}}{\text{Current Assets}} * 100$$

The inventory turnover ratio measures how many times a company's inventory has been sold during the year. If the inventory turnover ratio has decreased from past, it means that either inventory is growing or sales are dropping. In addition to that, if a firm has a turnover that is lower than for its industry, then there may be obsolete goods on hand, or inventory stocks may be high. Low inventory turnover has an impact on the liquidity of the business.

2. Debtors

The three main debtor ratios are as follows:

(i) Debtor Turnover Ratio

Debtor turnover, measures whether the amount of resources tied up in debtors is reasonable and whether the company has been efficient in converting debtors in to cash. The formula used is:

$$\frac{\text{Credit Sales}}{\text{Average Debtors}}$$

The higher the ratio, the better the position.

(ii) Average Collection Period

Average collection period measures the time that is taken to collect amounts from debtors. The formula used is:

$$\frac{\text{Average debtors}}{\text{Credit Sales}} * 365$$

The actual collection period can be compared with the stated credit terms of the company. If it is longer than those terms, then this indicates some insufficiency in the procedures for collecting debts.

(iii) Bad Debts

Bad debts, measures the proportion of bad debts to sales:

$$\frac{\text{Bad debts}}{\text{Sales}}$$

This ration indicates the efficiency of the credit control procedures of the company. Its level will depend on the type of business. Mail order companies have to accept a fairly high level of bad debts, while retailing organizations should maintain very low levels or, if they do not allow credit accounts, none at all, the actual ratio is compared with the target or norm to decide whether or not it is acceptable.

3. Creditors

(i) Creditors Turnover Period

The measurement of the creditor turnover period shows the average time taken to pay for goods and services purchased by the company. The formula used is:

$$\frac{\text{Average crediots}}{\text{Purchases}} \times 365$$

In general, the longer the credit period achieved the better, because delays in payment means that the operation of the company are being financed interest free by suppliers of funds. But there will be a point beyond which delays in payment will damage relationships with suppliers which, if they are operating in a seller's market, may harm the company. If too long a period is taken to pay creditors, the credit rating of the company may suffer, thereby making it more difficult to obtain suppliers in the future.

(ii) Creditors turnover ratio

The creditors turnover ratio is giver by the formula:

$$\frac{\text{Credit purchases}}{\text{Average creditors}}$$

The term creditors include trade creditors and bills payable.

4. Assets Turnover Ratios

This measures the company's ability to generate sales revenue in relation to the size of the asset investment. A low asset turnover may be remedied by increasing sales or by disposing of certain assets or both. To assist in establishing which part of the asset structure is not being used efficiently, the asset turnover ratio should be sub-analysed.

(i)Fixed Assets Turnover Ratio

It is the proportion of sales to the fixed assets, represented by,

$$\frac{\text{Sales}}{\text{Fixed assets}}$$

This ratio will be analysed further with ratios for each main category of asset. This is a difficult set of relation to interpret as asset values are based on historic cost. An increase in the fixed asset figure ay result from the replacement of an asset at an increased price or the purchase of an additional asset intended to increase production capacity. The later transaction might be expected to result in increased sales, whereas the former would more probably be reflected in reduced operating costs.

The ratio of the accumulated depreciation p0rovision to the total of fixed assets at cost might be used as an indicator of the average age of the assets; particularly when depreciation rates are noted in the accounts.

The ratio of sales value per share foot of floor space occupied is particularly significant for trading concerns, such as a wholesale warehouse or a department store.

(ii)Total Assets Turnover Ratio

This ratio indicates the number of times total assets are being turned over in a year.

$$\frac{\text{Sales}}{\text{Total assets}}$$

A higher ratio indicates overtrading of total assets while a low ratio indicates idle capacity.

5. Working Capital Turnover Ratio

This ratio is calculated as follows:

$$\frac{\text{Sales}}{\text{Working capital}}$$

This ratio indicates the extent of working capital turned over in achieving sales of the firm.

6. Sales to Capital Employed Ratio

This ratio is ascertained by dividing sales with capital employed.

$$\frac{\text{Sales}}{\text{Capital employed}}$$

This ratio indicate efficiency in utilisation of capital employed in generating revenue.

IV. Profitability Ratios

The purpose of study and analysis of profitability ratios is to help assess the adequacy of profits earned by the company and also to discover whether profitability is increasing or declining. The profitability of the firm is the result of a large number of policies and decisions. The profitability ratios are measured with reference to sales capital employed, total assets employed, share holders funds, etc. The major profitability ratios are as follows:

1. Return on capital employed (or return on investment) [ROI or ROCE]
2. Earnings per share (EPS)
3. Cash earnings per share (Cash EPS)
4. Gross profit margin
5. Net profit margin
6. Cash profit ratio
7. Return on assets
8. Return on net worth (or return on share holders equity)

1. Return on Capital Employed (ROCE) or Return on Investment (ROI)

The strategic aim of a business enterprise is to earn a return on capital. If in any particular case, the return in the long-run is not satisfactory, then the deficiency should be corrected or the activity be abandoned for a more favourable one. Measuring the historical performance of an investment centre calls for a comparison of the profit that has been earned with capital employed. The rate of return on investment is determined by dividing net profit or income by the capital employed or investment made to achieve that profit.

$$\text{ROI} = \frac{\text{Profit}}{\text{Invested capital}} \times 100$$

ROI consists of two components, viz., Profit margin, and Investment turnover, as shown below:

$$\text{ROI} = \frac{\text{Net profit}}{\text{Investment}} = \frac{\text{Net profit}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Investment in assets}}$$

It can be seen from the above formula that ROI can be improved by increasing one or both of its components, viz., the profit margin and the investment turnover in any of the following ways:

- Increasing the profit margin
- Increasing the investment turnover, or
- increasing both profit margin and investment turnover

The obvious generalisations that can be made about the ROI formula are that any action is beneficial provided that it:

- Boosts sales
- Reduces invested capital
- Reduces costs (While holding the other two factors constant)

Return on investment analysis provides a strong incentive for optimal utilisation of these assets of the company. This encourages magers to obtain assets that will provide a satisfactory return on investment and to dispose of assets that are not providing an acceptable return. In selecting amongst alternative long-term investment proposals, ROI provides a suitable measure for assessment of profitability of each proposal.

2. Earnings Per Share (EPS)

The objective of financial management is wealth or value maximisation of a corporate entity. The value is maximised when market price of equity shares is maximised. The use of the objective of wealth maximisation or net present value maximisation has been advocated as an appropriate and operationally feasible criterion to choose among the alternative financial actions. In practice, the performance of a corporation is better judged in terms of its earnings per share (EPS). The EPS is one of the important measures of economic performance of a corporate entity.

The flow of capital to the companies, under the present imperfect capital market conditions, would be made on the evaluation of EPS. Investors lacking inside and detailed information would look upon the EPS as the best base to take their investment decisions. A higher EPS means better capital productivity.

$$EPS = \frac{\text{Net profit after tax and preference dividend}}{\text{No. of equity shares}}$$

I. EPS When Debt and Equity Used

EPS When Debt, Preference and Equity Used

$$= \frac{(EBIT - I)(1 - T)}{N}$$

EPS When Debt, Preference and Equity Used

$$= \frac{(EBIT - I)(1 - T) - D_p}{N}$$

where EBIT = Earnings before interest and tax

I = Interest

T = Rate of corporate tax

D_p = Preference dividend

N = Number of equity shares

EPS is one of the most important ratios which measures the net profit earned per share.EPS is one of the major factors affecting the dividend policy of the firm and the market prices of the company. Growth in EPS is more relevant for pricing of shares from absolute EPS. A steady growth in EPS, year indicates a good track of profitability.

3. Cash Earnings Per Share

The cash earnings per share (cash EPS) is calculated by dividing the net profit before depreciation with number of equity shares.

$$\frac{\text{Net profit} + \text{Depreciation}}{\text{No. of Equity Shares}}$$

This is a more reliable yard stick for measurement of performance of companies, especially for highly capital intensive industries where provision for depreciation is substantial. This measures the cash earnings per share and is also a relevant factor for determining the price for the company's shares. However, this method is not as popular as EPS and is used as a supplementary measure of performance only.

4. Gross Profit Margin

The gross profit margin is calculated as follows:

$$= \frac{\text{Sales} - \text{Cost of goods sold}}{\text{Sales}} \times 100 = \frac{\text{Gross profit}}{\text{Sales}} \times 100$$

The ratio measures the gross profit margin on the total net sales made by the company. The gross profit represents the excess of sales proceeds during the period under observation over their cost, before taking into account administration, selling and distribution and financing charges. The ratio measures the efficiency of the company's operations and this can be compared with the previous years results to ascertain the efficiency patterns with respect to the previous years.

When everything is normal, the gross profit margin should remain unchanged, irrespective of the level of production and sales. Since it is based on the assumption that all costs deducted when computing gross profit which are directly variable with sales. A stable gross profit margin is therefore, the norm and any variation from it call for careful investigations, which may be caused due to the following reasons:

i. Price cuts: A company needs to reduce its selling price to achieve the desired increase in sales.

ii. Cost increases: The price which a company pays to its suppliers during period of inflation is likely to rise and this reduces the gross profit margin unless an appropriate adjustment is made to the selling price.

iii. Change in mix: A change in the range or mix of products sold causes the overall gross profit margin, assuming individual product lines earn different gross profit percentages.

iv. Under or Over-valuation of stocks: If closing stocks are under-valued, cost of goods sold is inflated and profit understated. An incorrect valuation may be the result of an error during stock taking or it may be due to fraud. The gross profit margin may be compared with that of competitors in the industry to assess the operational performance relative to the other players in the industry.

5. Net Profit Margin

The ratio is calculated as follows:

$$\frac{\text{Net profit before interest and tax}}{\text{Sales}} \times 100$$

The ratio is designed to focus attention on the net profit margin arising from business operations before interest and tax is deducted. The convention is to express profit after tax and interest as a percentage of sales. But a drawback in this is that the percentage which results varies depending on the sources employed to finance business activity;

interest is charged 'above the line' while dividends are deducted 'below the line'. It is for this reason that net profit, i.e. earnings before interest and tax (EBIT) is used.

This ratio reflects net profit margin on the total sales after deducting all expenses but before deducting interest and taxation. This ratio measures the efficiency of operation of the company. The net profit is arrived at from gross profit after deducting administration, selling and distribution expenses. The non-operating incomes and expenses are ignored in computation of net profit before tax, depreciation and interest.

This ratio could be compared with that of the previous year's ratio and with that of competitor's ratio, to determine the trend in net profit margins of the company, and its performance in the industry. This measure will depict the correct trend of performance where there are erratic fluctuations in the tax provisions from year to year. It is to be observed that majority of the costs debited to the profit and loss account are fixed in nature, and any increase in sales will cause the cost per unit to decline because of the spread of same fixed cost over the increased number of units sold.

6. Cash Profit Ratio

$$\frac{\text{Cash profit}}{\text{Sales}} \times 100$$

Where Cash profit = Net profit + Depreciation

Cash profit ratio measures the cash generation in the business as a result of the operations expressed in terms of sales. The cash profit ratio is a more reliable indicator of performance where there are sharp fluctuations in the profit before tax and net profit from year to year owing to difference in depreciation charged. Cash profit ratio evaluates the efficiency of operations in terms of cash generation and is not affected by the method of depreciation charged. It also facilitate the inter-firm comparison of performance since different methods of depreciation may be adopted by different companies.

7. Return on Assets

This ratio is calculated as follows:

$$\frac{\text{Net profit after tax}}{\text{Total assets}} \times 100$$

The profitability of the firm is measured by establishing relation of net profit with the total assets of the organization. This ratio indicates the efficiency of utilisation of assets in generating revenue.

8. Return on Shareholders Funds or Return on Net Worth

$$\frac{\text{Net profit after interest}}{\text{Net worth}} \times 100$$

where, Net worth = Equity capital + Reserves and Surplus.

This ratio expresses the net profit in terms of the equity shareholders funds. This ratio is an important yardstick of the performance of equity shareholders since it indicates the return on the funds employed by them. However, this measure is based on the historical net worth and will be high for old plants and low for new plants.

The factor which motivates shareholders to invest in a company is the expectation of an adequate rate of return on their funds and periodically, they will want to assess the rate of return earned in order to decide whether to continue with their investment. There are various factors of measuring the return including the earnings yield and dividend yield which are examined at later stage. This ratio is useful in measuring the rate of return as a percentage of the book value of shareholders equity.

The further modification of this ratio is made by considering the profitability from equity share holder's, point of view that, can also be worked out by taking the profits after preference dividend and comparing against capital employed after deducting both long-term loans and preference capital.

V. Operating Ratios

The ratios of all operating expenses (i.e. materials used, labour, factory overheads, administration and selling expenses) to sales is the operating ratio. A comparison of the operating ratio would indicate whether the cost content is high or low in the figure of sales. If the annual comparison shows that the sales has increased, the management would be naturally interested and concerned to know as to which element of the cost has gone up. It is not necessary that the management should be concerned only when the operating ratio goes up. If the operating ratio has fallen, though the unit selling price has remained the same, still the position needs analysis as it may be the sum total of efficiency in certain departments and inefficiency in others. A dynamic management is one which is interested in making a complete analysis.

It is, therefore, necessary to break-up the operating ratio into various cost ratios. The major components of cost are: material, labour and overheads. Therefore, it is worthwhile to classify the cost ratio as:

$$1.\ \text{Materials Cost Ratio} = \frac{\text{Materials Consumed}}{\text{Sales}} \times 100$$

$$2.\ \text{Labour Cost Ratio} = \frac{\text{Labour cost}}{\text{Sales}} \times 100$$

$$3.\ \text{Factory Overhead Ratio} = \frac{\text{Factory Expenses}}{\text{Sales}} \times 100$$

$$4.\ \text{Administrative Expense Ratio} = \frac{\text{Administrative Expenses}}{\text{Sales}} \times 100$$

$$5.\ \text{Selling and Distribution Expenses Ratio} = \frac{\text{Selling and Distribution Expenses}}{\text{Salses}} \times 100$$

Generally, all these ratios are expressed in terms of percentage. Totalling up all the operating ratios and then deducting from 100 will be equal to the net profit ratio. If possible, the total expenditure for effecting sales should be divided into two categories, viz, fixed and variable, and then ratios should be worked out. The ratio of variable expenses to sales will be generally constant; that of fixed expenses should fall if sales increase, it will increase if sales fall.

VI. Market Test Ratios

The market test ratios relate the firm's stock price to its earnings and book value per share. These ratios give management an indication o9f what investors think of the company's past performance and future prospectus. It firm's profitability, solvency and turnover ratios are good, then the market test ratios will be high and its share price is also expected to be high. The market test ratios are as follows:

1. Dividend payout ratio
2. Dividend yield
3. Book value
4. Price/Earnings ratio

1. Dividend Payout Ratio

$$\frac{\textbf{Divdend per share}}{\textbf{Earning per share}}$$

Dividend payout ratio is the dividend per share divided by the earnings per share. Dividend payout indicates the extent of the net profits distributed to the shareholders as

dividend. A high payout signifies a liberal distribution policy and a low payout reflects conservative distribution policy.

2. Dividend Yield

$$\frac{\text{Divident per share}}{\text{Market price}} \times 100$$

This ratio reflects the percentage yield that an investor receives on this investment at the current market price of the shares. This measure is useful for investors who are interested in yield per share rather than capital appreciation.

3.Book Value

$$\frac{\text{Equity Capital} + \text{Reserves} - \text{Profit and Loss debit balance}}{\text{Total number of equity shares}}$$

This ratio indicates the net worth per equity share. The book value is a reflection of the past earning s and the distribution policy of the company. A high book value indicates that a company has huge reserves and is a potential bonus candidate. A low book value signifies liberal distribution policy of bonus and dividends, or alternatively, a poor track record of profitability. Book value is considered less relevant for the marker price as compared to EPS, as it reflects the past record whereas the market discounts the future prospects.

4. Price Earnings Ratio (P/E Ratio)

$$\frac{\text{Current market price}}{\text{Earnings per share}}$$

This ratios measure the number of times the earnings of the latest year at which the share price of a company is quoted. It signifies the number of years, in which the earnings can equal to current market price. This ratio reflects the market's assessment of the future earnings potential of the company. A high P/E ratio reflects high earnings potential and a low P/E ratio reflects low earnings potential. The P/E ratio reflects the market's confidence in the company's equity. P/E ratio is a barometer of the market sentiment. Companies with excellent track record of profitability, professional management and liberal distribution policy have high P/E ratios whereas companies with moderate track record, conservative distribution policy and average prospects quote a low P/E ratios. The market price discounts the expected earnings of a company for the current year as opposed to the historical EPS.

Classification of Financial Ratios

Introduction

Financial Statement viz., Balance sheet, the Income Statement, the Statement of Retained Earnings and the Statement of Changes in Financial Position, report what has actually happened to earnings during a specified period. We learnt how a balance sheet presents a summary of financial position of the company at a given point of time. The Statement of Retained earnings reconciles income earned during the year and any dividends distributed with the change in retained earnings between the start and end of the financial year under study. The statement of changes in financial position provides a summary of funds flow during the period of financial statements.

Ratio analysis is a very powerful analytical tool for measuring performance of an organization. The ratio analysis concentrates on the inter-relationship among the figures appearing in the aforementioned four financial statements. The ratio analysis helps the management to analyse the past performance of the firm and to make further projections. It allows interested parties like shareholders, investors, creditors, government and analysts to make an evaluation of certain aspects of a firm's performance.

Ratio analysis is a process of comparison of one figure against another, which make a ratio, and the appraisal of the ratios to make proper analysis about the strengths and weaknesses of the firm's operations. The calculation of ratios is a relatively easy and simple task but the proper analysis and interpretation of the ratios can be made only by the skilled analyst. While interpreting the financial information, the analyst has to be careful in limitations imposed by the accounting concepts and methods of valuation. Information of non-financial nature will also be taken into consideration before a meaningful analysis is made.

Ratio analysis is extremely helpful in providing valuable insight into a company's financial picture. Ratios normally pinpoint a business strengths and weakness in two ways:

- Ratios provide an easy way to compare today's performance with past.
- Ratios depict the areas in which a particular business is competitively advantaged or disadvantaged by comparing ratios to those of other businesses of the same size within the same industry.

CATEGORIES OF RATIOS

The ratio analysis is made under six broad categories as follows:

I. Long-term solvency ratios

II. Short-tem solvency ratios

III. Profitability ratios

IV. Activity ratios

V. Operating ratios

LIMITATIONS IN THE USE OF RATIO ANALYSIS

Ratios by themselves mean nothing. They must always be compared with:

- a norm or a target;
- previous ratios in order to assess trends;
- the ratios achieved in other comparable companies (inter-company comparisons); and
- Caution has to be exercised in using ratios.

The following limitations must be taken into account:

- Ratios are calculated from financial statements which are affected by the financial bases and policies adopted on such matters as depreciation and the values of stocks.
- Financial statements do not represent a complete picture of the business, but merely a collection of facts which can be expressed in monetary terms. They may not refer to other factors which affect performance.
- Over use of ratios as controls on managers could be dangerous, as the management might concentrate more on simply improving the ratio than on dealing with the significant issues. For example, the return on capital employed can be improved by reducing assets rather than increasing assets rather than increasing profits.
- A ratio is a comparison of two figures, a numerator and a denominator. In comparing ratios it may be difficult to determine whether differences are due to changes in the numerator, or in the denominator or in both.
- Ratios are inter-connected, thus, they should not be treated in isolation. The effective use of ratios, therefore, depends on being aware of all these limitations and ensuring that, following comparative analysis, they are used as a trigger point for investigation and corrective action rather than being treated as meaningful in themselves.

- The analysis of ratios clarifies trends and weaknesses in performance as a guide to action as long as proper comparisons are made and the reasons for adverse trends or deviations from the norm are investigated thoroughly

Model Questions :

1. Define Ratio analysis.
2. List out the categories of ratios.
3. What is profitability ratio?
4. Write a note on short term solvency ratio.
5. What is debt equity ratio?
6. Define current ratio.
7. Explain the profitability ratios.
8. Describe the operating ratio.
9. Write a note on cash profit ratio.
10. What is net profit margin?

Methods of Project Evaluation

After studying this unit you should be able to

- Explain the NPV method.
- Describe the payback Method .
- Examine the IRR method
- Define ARR.

NET PRESENT VALUE (NPV) METHOD

Net present value is computed given the original investment, annual cash flows (PAT + Depreciation) and required rate of return which is equal to the cost of capital. Given these, NPV is calculated as follows

NPV = $-I + \sum_{t=1}^{n} CF_t / (1+k)^t$

Where,

I = Original or initial investment

CF_t = annual cash flows

K = cost of capital and

t = time measured in years.

For the problem we have done under the pay back period method we can get the NPV, taking k = say 10% or 0.1. Then the

NPV = $-I + CF_1 / (1+k)^1 + CF_2 / (1+k)^2 + CF_3 / (1+k)^3 + CF_4 / (1+k)^4$

= $-20,00,000 + 14,10,000/1.1 + 19,70,000/1.1^2 + 11,60,000/1.1^3 + 5,60,000/1.1^4$

= -20,00,000 +14,10,000*0.909 + 19,70,000*0.826 +11,60,000*0.751 + 5,60,000*0.683

= -20,00,000 + 12,81,818 + 16,28,099 +8,71,525 + 3,79,042

= -20,00,000 + 41,60,484 = Rs 21,60,484

If it is required that k = 10%, 11%, 12% and 13% respectively for year 1 through year 4, the formula is written as follows.

$NPV = -I + CF_t/(1+k)^t$

$= -I + CF_1/(1+k)^1 + CF_2/(1+k)^2 + CF_3/(1+k)^3 + CF_4/(1+k)^4$

In the above example

$NPV = -20,00,000 + 14,10,000/1.1 + 19,70,000/1.11^2 + 11,60,000/1.12^3 + 5,60,000/1.13^4$

$= -20,00,000 + 14,10,000*0.909 + 19,70,000*0.817 + 11,60,000*0.712 + 5,60,000*0.635$

= -20,00,000+40,49,482 = Rs. 20,49,482

If the NPV = 0' or greater than zero, the project can be taken. In case there are several mutually exclusive projects with NPV >0, we will select the one with highest NPV. In the case of mutually inclusive projects you first take up the one with highest NPV, next the project with next highest NPT, and so on as long as your fund for investments lasts. The factor ='k' need not be same for all projects. It can be high for projects whose cash flows suffer greater fluctuations due to risk, and lower for projects with lower fluctuation.

PAYBACK PERIOD (PBP) METHOD

Pay back period refers to the number of years one has to wait to get back the capital invested in fixed assets in the beginning. For this we have to get the cash flow from business.

We have invested Rs. 20,00,000 at time zero. After one year a sum of Rs. 14,10,000 is returned. By next year a sum of Rs. 19,70,000 is returned. But we have to get back only Rs. 5,90,000 (i.e., 20,00,000 - 14,10,000). So, in the second we have to wait only for part of the year to get back Rs. 5,90,000. The part of the year = 5,90,000/19,70,000 = 0.30. That is, pay back period is 1.30 years or 1 year, 3 months and 19 days.

In general pay-back period is given by 'n' in the equation

$$\sum_{t=1}^{n} CF_t - I = 0$$

where 't'= 1 to n, I = initial investment, CF_t = cash flow at time 't' and t=time measured in years.

Normally business as want projects that have lease payback period, because the invested money is got back very soon. As future is risky, earlier one gets back the money invested the better for him. Some businesses fix a maximum limit on pay back period. This is the cut-off pay back period, serving as the decision criterion. Accordingly a pay back period ceiling of 3 years means, only projects with payback period equal to or less than 3 years will be accepted.

Merits of Payback Period

- **i.** It is cash flow based which is a definite concept
- **ii.** Liquidity aspect is taken care of well
- **iii.** Risky projects are avoided by going for low gestation period projects
- **iv.** It is simple, common sense oriented.

Demerits of Payback Period

i. Time value of money is not considered as earnings of all years are simply added together.

ii. Explicit consideration for risk is not involved

iii. Post-payback period profitability is ignored totally.

INTERNAL RATE OF RETURN (IRR) METHOD

Internal Rate of Return (IRR) is the value of "k" in the equation, $-I + \sum CF_t/(1+k)^t = 0$. In other words, IRR is that value of "k" for which aggregated discounted value of cash flows from the project is equal to original investment in the project. When manually computed, "k" i.e., IRR is got through trial and error and if need be, adopting a sort of interpolation. Suppose for a particular value of k, $-I + \sum CF_t/(1+k)^t > 0$, we have to use a higher 'k' in our next trial and if the value is < 0, a lower 'k' has to employed next time. Then you can interpolate k. The value of 'k' thus got is the IRR. For the project in question (dealt under NPV), the IRR is worked out as follows:

If we take, k=50%, then, $\sum CF_t/(1+k)^t$ comes to 22,69,877 i.e., [14,10,000/1.5 + 19,70,000/1.5^2 + 11,60,000/1.5^3+5,60,000/1.5^4]. This is higher than the 'I' by 2,69,877.

So, 'k' is enhanced to 60%. Then 14,10,000/1.6 + 19,70,000/1.6^2 + 11,60,000/1.6^3+5,60,000/1.6^4, i.e., $\sum CF_t/(1+k)^t$ comes to Rs. 20,19,433. This is marginally higher than 'I'. So, we have to still try at higher discount rate, say 61%. The PV comes to Rs. 19,97,083. Now, we can take the interpolated value as the IRR, which is between 60% and 61%.

IRR = 60% + [(20,19,433-20,00,000)/(20,19,423-19,97,083)]*(61%-60%)

= 60% + [19433/22350]*1% = 60% + 0.869% = 60.869%

If the computed IRR is equal to or greater than cost of capital, the project will be selected. Otherwise, it is rejected. For mutually exclusive projects, project with highest IRR, subject to it being equal to or greater than cost of capital, will be chosen. For mutually inclusive projects, you start taking up first the project with highest IRR, next, the next highest IRR project and so on subject to (i) the IRR is greater than or equal to cost of capital and (ii) you have investible fund.

ACCOUNTING RATE OF RETURN (ARR) METHOD

Here the accounting rate of return (ARR) is calculated. It is also called as average rate of return. To compute ARR average annual profit is calculated first. From the PBT for different years (as in table 4.1) average annual PBT can be calculated.

The average annual PBT = Total PBT / No. of years

AAPBT = 46,00,000/4

= 11,50,000

ARR = AAPBT / Investment

= 11,50,000 / 20,00,000 = 0.574 = 57.4%

The denominator can be average investment, i.e., (original value plus terminal value) /2. Here it is 10 lakhs. Then the ARR will be Rs. 11,50,000 / Rs. 10,00,000 = 1.148 or 114.8%.

ARR can also be computed on the basis of PAT. The formula is: Average Annual PAT / Original Investment.

Average Annual PAT = Total PAT / No. of years

= 31,00,000 / 4 = 7,75,000

So, ARR = 7,75,000 / 20,00,000 = 0.3875 = 38.75%

The denominator can be the average investment, instead of original investment, them ARR is = Rs. 7,75,000 / Rs. 10,00,000 = 0.775 or 77.5%.

Merits of ARR

i. It is simple, common sense oriented

ii. Profits of all years taken into account

Demerits of ARR

i. Time value of money is not considered

ii. Risk involved in the project is not considered

iii. Annual average profits might be same for different projects but accrual of profits might differ having significant implications on risk and liquidity

iv. The ARR has several variants and that it lacks uniform understanding.

A minimum ARR is fixed as the benchmark rate or cut-off rate. The estimated ARR for an investment must be equal to or more than this benchmark or cut off rate so that the investment or project is chosen.

Model Question

1. Explain the methods of project Evaluation.
2. Examine the Internal Rate of Return method.
3. Write a note on Accounting Rate of Return.
4. Explain the Net Present Value Method.
5. What are the merits and demerits of Payback method?

Books for Reference

1. Barthwal.R.R(2006) Industrial Economics, New Age International Publishers, New Delhi.

COST-BENEFIT ANALYSIS

After studying this unit you should be able to

- **Explain the cost benefit analysis.**
- **Describe the evaluation on the basis of benefit.**
- **Explain the Net Present Value Criterion.**
- **List out the limitations of cost benefit analysis.**

Introduction to Cost Benefit Analysis

Project evaluation is a micro planning technique which is used to assess the social desirability of a project in valuing public expenditure. It implies an assessment of a project in valuing public expenditure. It implies an assessment of a project as to its operational efficiency, technically, economically, financially and managerially. It is the evaluation of cost and benefits of each investment proposal meant for inclusion in a plan. Indian Planning Commission observes, that 'Evaluation is an aid to policy'. It may be considered as a branch of action programme. It is an integral part of development programme. According to **Hyman** "Project evaluation refers to the procedures of fact finding about the results of planned social action which in turn, moves the spiral of planning over upward. It is the proper methodological accompaniment of rational action." According to the second five year "Evaluation is an essential aid to policy. It may be considered to be a branch of research which is oriented primarily to the needs of an action programme".

"Project evaluation utilizes principles similar to those....for the evaluation of industrial sectors, but it requires more extensive study of individual elements whereas sector analysis is applied only to the typical cost and demand conditions in the industry, project analysis takes into account a variety of supply and demand factors that are peculiar to the commodities and production technique under consideration". Thus, we may say that the technique of project evaluation is useful both for developed and under-developed

countries. Since it helps to assess its success and failures and suggest further line of action. Project evaluation is a technique of optimization.

STAGES OF PROJECT EVALUATION

Project evaluation has four stages:

I. To review the situation before starting the project.

II. To make appraisal of the project when it is started.

III. To suggest certain measures to improve the project in the light of its failure.

IV. To evaluate the project ultimately in respect of its objectives.

METHODS OF EVALUATION/STAGES

The methods to evaluate are:

I) Description of the technical and economic characteristics of each project

II) Estimation of the impact of the project on the economy both during the construction phase and operational phase

III) Evaluation of the consequences of project which may be direct or indirect.

IV) Formulation of criterion for the selection of the project.

COST-BENE FIT ANALYSIS

The most significant and well-known method of project evaluation in our country is Cost Benefit Analysis. Regarding Cost Benefit Analysis Prof S.A. Marglin advocated that the 'perspective and five year plan determine the broad strategy of growth by allocating of resources among sectors. But the strategy of growth embodied in the plans leaves many technical questions unresolved and it is these tactical decisions that are the province of cost-benefit analysis." Cost Benefit Analysis provides superior criteria for project evaluation in planned economy. It helps the planning authority in making correct investment decision to achieve optimum resource allocation by maximising the difference between present value of benefit and cost of a project. Thus, cost-benefit analysis "purports to describe and quantify the social advantage and disadvantages of a policy in terms of a common monetary unit." Its objective function can be expressed as net social **Benefit NSB = Benefits - Costs**, where benefits and costs are measured in terms of "**Shadow"** or '**accounting'** prices of input and outputs instead of in actual market price.

The entire cost-benefit analysis revolves around three steps:

(i) Enumeration of cost and benefits.

(ii) Evaluating cost and benefits.

(iii) Comparing them.

Criteria for Cost-Benefit Analysis

The project evaluation must be made on cost-benefit analysis to formulate optimal development plans. The social benefits of a project includes the conclusion that the project would make to the attainment o f national goals.

Cost: Cost refers to the value of resources used in constructing the project and incurred in producing current output. The cost of capital, labour, salary of managers, natural resources, intermediate goods and advertisement constitute the total cost.

Benefits: Benefits refers to the addition to the flow of national output accruing from a project. A project may be regarded beneficial when it tends to increase the income of the people and that can be measured by the actual increase in production and consumption. Benefits may be real or nominal, tangible and intangible direct and indirect.

Evaluation on the Basis of Benefit

1. Real Benefit stands to be important since bounding of a river valley project increases irrigational facility to the cultivator which is just nominal benefit, but along with this it also promotes productivity and enhances a rise in real income of the agriculturist. This is a real benefit. Therefore, if a project promotes both real and nominal benefit then it is beneficial

2. Direct Benefits are those benefits which are directly obtainable from a project. For instance, a river valley project directly provides benefits like irrigational facility, power generation, flood control etc. But it also provides indirect benefits in the form of employment opportunities, construction of new railway line, road, tourist resort, establishment of factories etc. Therefore, in selecting a project only these projects should be chosen which promotes both direct and indirect benefits.

3. Tangible Benefits are those which can be measured in monetary terms while intangible benefits are those which cannot be measured in monetary terms. All benefits accuring from any river valley project are tangible and they can be easily valued in monetary terms.

4. Intangible Benefit refers to the individual valuation and they may be positive or negative. A good looking view of the Dam and recreational value of the Dam refer to the positive intangible benefits while the **negative intangible benefits** refer to all the losses of the people of that region accrued as a result of the Dam.

Evaluation on the Basis of Cost

1. Real and Nominal Cost: Cost may be real or nominal since they involve real sacrifice on the part of people or not. If money is borrowed from the people it is a case of **Nominal cost** but if people are required to construct project themselves they will be incurring real sacrifices and then it will be a case of **Real cost.**

2. Primary and Secondary Cost: Primary Cost are those which are directly incurred on the construction of a project. **Secondary Cost** includes the cost providing benefits to the people working on project such as cost of constructing houses, schools, etc. at the sight of a project

3. Associated Cost: They are the value of goods and services needed beyond these included in the cost of a project to make immediate products or services of the project available for use or sale. For example the farmer's cost of producing irrigated crop other than any charge for water would be his associated cost of producing crops.

4. Project Cost: These are the value of resources used in constructing, maintaining and operating the project. This includes cost of labour, capital equipment, intermediate good, natural resources, foreign exchange etc.

Thus in evaluating a project we are to compute and compare its total benefits and total direct cost. If the **benefits are expected to be more than cost,** then only the **project is profitable** otherwise not.

Thus U.S. Sub-committee on benefit and cost has suggested four benefit **cost criteria.** They are:

(i) B - C (ii) B - C/I

(iii) $\Delta B/\Delta C$ (iv) B/C

where B= Benefits, C= Cost, I=Direct Investment, Δ=Increment.

The formula B-C/I is "for determining the total annual returns on a particular investment to the economy as a whole irrespective of to whom these accrue". If private investment is large then high value of B-C/I may be less beneficial to the economy. The second criteria of $\Delta B/\Delta C = 1$ is meant to determine the size of project. The criterion B-C favours large project and makes small and medium projects less beneficial. Thus this criterion helps in determining the scale of the project on the basis of the maximization of the difference between B and C. The most effective criterion for project evaluation of project is done on the basis of Benefit Cost Ratio. If B/C = 1 then the project is marginal because the benefits accruing from the project just covers the cost. If B/C < 1 the benefits are less than cost so the project is not acceptable. Finally, **B/C >1** then of course the project becomes profitable and hence acceptable. Greater the benefit the more profit oriented is the project.

The criterion discussed does not account for the time factor**.** Future benefits and cost cannot be treated at par with present benefit and costs. Therefore, project evaluation requires Discounting of Future Benefits and Costs because society prefers present to the future. For this purpose economist have devised a number of 'decision rules' or criterion. But we shall discuss present value criterion and internal rate of return criterion.

NET PRESENT VALUE CRITERION

Net Present Value = Present Value of Benefit - Present Value of Operating and maintaining Cost- Initial Outlay. Thus, NPV of Benefit = Gross Present value of Benefit - Gross Preset Value of Cost when NPV B >0 then the project is socially profitable. But this criterion is not accurate method since it neglects time horizon. Capital investment gives benefit after a lapse of sometime. Therefore, future benefits and cost cannot be equated with present benefit and costs. So it becomes essential to discount future benefits and cost since society prefers present to future. The discount factor is expressed as:

$$D = \frac{1}{(1+i)'}$$

Here i= social discount rate, t= time period

thus,

$$NPV = \left[\frac{B1}{(1+i)} + \frac{B2}{(1+i)^2} + \cdots \frac{Bn}{(1+i)^n}\right] - \left[\frac{C1}{(1+i)} + \ldots + \frac{C2}{(1+i)^2} + \cdots + \frac{Cn}{(1+i)^n}\right]$$

B1,B2,...Bn = Series of Gross present benefits in period 1,2...n

C1,C2,...Cn = Series of Gross present cost in period, 1,2...n

i = Social rate of discount for annual compounding.

In making a choice projects either of the two rules be followed.

1. All projects where the ratio of present value of benefit to the present values of cost is >1.
2. **Expressed symbolically as such**

$$\frac{\frac{B1}{(1+i)} + \frac{B2}{(1+i)^2} + \cdots \frac{Bn}{(1+i)^n}}{\frac{C1}{(1+i)} + \frac{C2}{(1+i)^2} + \cdots \frac{Cn}{(1+i)^n}} > 1$$

3. Only those projects should be selected in which the present value of benefits exceed the present value of cost where symbolically

$$\left[\frac{B1}{(1+i)}+\frac{B2}{(1+i)^2}+\cdots\frac{Bn}{(1+i)^n}\right]>\left[\frac{C1}{(1+i)}+\ldots+\frac{C2}{(1+i)^2}+\cdots+\frac{Cn}{(1+i)^n}\right]$$

The NPV criterion is the most appropriate rule for the project evaluation.

The Internal Rate of Return Criterion

This criterion refers to the percentage rate of return implicit in the flows of benefits and cost of projects. Marglin defines the IRR as the discount rate at which present value of return minus cost is zero. The mathematical formula for the computation of IRR is:

$$\frac{B1-C1}{(1+r)}+\frac{B2-C2}{(1+r)^2}+\cdots\frac{Bn-Cn}{(1+r)^n}=0$$

where, r= Internal rate of return. In case of usually exclusive projects the project to be selected must have highest rate of return. The choice on the basis of changes in discount rate is called "Switching" and "Reswitching".

This criterion has certain limitation

1. It is not possible to change the rate of return assumed for the calculation of profitability of project.
2. It is difficult to calculate rate of return on long gestation project which does not yield benefit for many years.
3. It is not applicable to highly capital intensive projects.
4. It is difficult to calculate IRR in which the entire investment outlay cannot be made in the first period.
5. The use of IRR for public investment does not yield correct decision.
6. It is difficult to make choice between two alternative investment on the basis of their alternative IRR.
7. Since IRR depends on social rate of discount. The choice of projects depends upon discount rate if NPV of projects are given. This can be explained diagrammatically:

The rate of discount is measured along OX axis and NPV OY axis. The curve I I' depicts investment of project I and QQ' of project Q. The IRR of project Q is >than of project I because discount rate or is >than or'. At Oq_2 the IRR of both projects are equal. But if discount rate falls below Oq_2 project I will be chosen because its NPV is higher by ik. Of the two criterion NPV is technically superior to IRR. Since IRR can give incorrect result in special circumstances.

The Social Rate of Discount

The rate at which future benefits must be discounted to make then comparable with present benefit is called Social rate of discount. In other words it is the rate of the premium which the society puts for preferring the present consumption to future consumption.

The Social rate of discount is a constant rate over time the choice of a discount rate affects the projects to be undertaken. "A discount rate of 5% might well lead to twice as much investment as one of 10% together with equivalent reduction in consumption". If the discount rate is high short period projects with higher net benefits are preferred. On the contrary when the discount rate is low, long period projects with lower, net benefits are selected.

Since benefits and cost are to occur in future they are discounted in order to find their present net worth so there is a problem of choosing suitable rate at which future benefits are discounted. Generally, the market rate is used for this purpose but it fails to solve the purpose where there is multiplicity of rate of interest in market or the private and social rate of discount may not concede so there is no scientific way of choosing a suitable rate.

LIMITATION OF COST BENEFIT ANALYSIS

1. The correct estimation of benefits from a project becomes difficult due to uncertainties regarding future demand and supply of the products from a new project and their prices.

   The presence of external economics may lead to selling of the project at price equal to marginal cost and not equal to average cost which will create a deficit and efforts are made by a special levy on consumers or through Budgetary resources.

   This method does not solve the problem in the best possible manner. In this method the different projects are measured by the scale. If one uses a shadow rate of exchange it would apply to all projects. If one uses a shadow rate of exchange it would apply to all projects. This method does not consider external effects to be incurred on cost and benefits. Prof Lewis writes in this context " To calculate the true net social benefit of an investment calls for skepticism as well as skill. The figures submitted to government almost always involve exaggerated optimism and double counting. If one use low shadow image in valuing labour, when calculating costs, one must also, when calculating benefits give extra credit to the projects because it will relieve unemployment. Shadow prices may be applied to cost or to benefits, the same item should not appear in both. Again annual values and capital values should not be added

together. The gross benefit can neither be obtained by valuing increased output at a initial price nor can it be estimated by using new price.

2. The social rate of discount assumed for any project is arbitrary. There is no perfect method to find social discount rate. A small change in discount rate may change the full result of project evaluation. The arbitrarily large discount rate does not help in calculating the net present value of benefits of long term project.
3. This method ignores opportunity cost problems. Griffin and Enos states that if all prices reflect opportunity costs all projects for which B/C < 1 would be chosen.
4. The side effects of a project are difficult to be calculated. There may be technological and pecuniary externalities of a river valley project such as the effects of flood control measures or a storage dam on the productivity of land at other places in the vicinity.
5. Another, problem arises with regards to choice of criteria. A wrong choice of criteria may lead to false conclusions.
6. It neglects joint benefits and cost arising from a project. There are a number of direct and indirect benefits flowing from river valley project but it is difficult to calculate and evaluate such benefits separately.
7. Cost estimates are made on the basis of choice of technique location and prices of factor services used. Market prices of factors of production are used for this purpose provided they reflect opportunity cost because there is fundamental disequilibria which is reflected in the existence of massive under-employment at the prevailing level of wages the deficiency of funds at prevailing interest rates and the shortage of exchange at current rates of exchange. The equilibrium level of wage rates will be considerably lower than market wage while equilibrium interest rates will be probably much either than the market rates. To remove this problem, the use of shadow prices has been suggested. In the cost-benefit analysis we thus cannot take the opportunity cost of labour as zero.
8. It is difficult to obtain required data in Under-Developed Countries. It is not possible to assess the benefits that are likely to accrue to people from a particular project and hence the element of arbitrariness in cost benefit analysis may be quite high. In certain cases both tangible and intangible benefits are difficult to assess.
9. Further assessing the cost of a project is not easy task. Preliminary estimates of costs are made but they are either over-estimated or under estimated. Rise in prices, shortage of raw material and foreign exchange difficulties often stand in the ways of accurate cost assessment. According to Prof. Lewis "Assessing the cost and the benefits of new industrial enterprise is highly specialised work which is best left to

experienced consultants. Without such specialised knowledge project analysis is bound to be wrong.

Model Question :

1. **Explain the cost benefit analysis.**
2. **Describe the evaluation on the basis of benefit.**
3. **Explain the Net Present Value Criterion.**
4. **List out the limitations of cost benefit analysis.**

INVENTORY INVESTMENT APPROACH

After studying this unit you should be able to

- **Explain the Inventory management Technique.**
- **Describe the EOQ technique.**
- **Examine the Stock level techniques**
- **State the ABC technique.**

Inventory Management Techniques:

Several inventory management techniques are available. The above referred to EOQ and inventory levels are themselves are some techniques of management of inventory under conditions of certainty and uncertainty. These are presented right now. Then the ABC control technique is presented.

EOQ Technique

When an organisation is operating under conditions of absolute certainty, inventory planning is relatively a simple affair. By conditions of certainty, it is meant that the rate of usage of or demand for the item of inventory in question is stable, the lead time is fixed, and the supplier of the item is able to execute orders any time. When all these conditions are satisfied, it would be enough if the organisation maintains adequate inventory for its transactional needs. In other words, there is no need to hold inventory for meeting contingencies. All that it needs to do is to determine the optimum reorder quantity and the reorder-level. Under certainty business conditions there is no need to carry any safety stock at all and the minimum stock level is zero. The maximum stock level shall be equal to the reorder-quantity. To determine the optimum order quantity the costs of inventory are considered. Inventory holding involves two types of costs, namely, carrying costs and non-carrying costs. Whatever the level of inventory held there would involve certain amount of both these costs. Carrying costs refer to cost of capital locked up in inventory,

space and storage, insurance, tax, etc. Non-carrying costs refer to ordering costs, lost sales, lost quantity discounts, etc. At optimum order quantity the two costs together are the minimum.

Given the total quantity needed during a certain period of time be 'A' units, the quantity to be ordered be 'Q' units each time, the cost of carrying one unit of inventory being 'C' rupees per period and the cost of placing an order be 'O' rupees, the total carrying costs would be QC/2 and total ordering costs would be AO/Q.

At optimum order quantity the total inventory cost i.e., (AO/Q),(QC/2) would be the least. By differentiating (AO/Q)+(QC/2) with respect to quantity and setting the same as equivalent to Zero, we get --

$-\frac{-AO}{Q^2}+\frac{C}{2}$ by putting this equal to zero, we get

$$\frac{AO}{Q^2} = \frac{C}{2}$$

i.e., $2AO = Q^2C$

i.e., $Q^2 = 2AO/2$

i.e., $Q = \sqrt{2AO/C}$

Illustration

If the annual usage is 36000 units, cost per unit is Rs. 100, cost of carrying one unit for one year is 20% of cost and cost of placing an order is Rs. 400, find the optimum order quantity.

Solution

$EOQ = \sqrt{2AO/C} = \sqrt{2 * 36000 * 400/20} =$ 1200 units

Case 1:

But in practice an organisation cannot always stick to the optimum order quantity, due to limitations of facility or restrictions on the size of orders imposed by the supplier or varying quantity discounts offered by the supplier depending on the size of individual orders. In all these cases the relative costs of all possible alternatives have to be found out before the decision is finally taken on the size of reorder quantity or the EOQ.

Illustrative Cases

Continuing the example already given and assuming that the organisation is having storage facility to accommodate only 1000 units but has facility to hire space to store additional 200 units at an extra cost of Rs. 2000 per annum, the right quantity to be ordered would be calculated as given below:

TABLE 1

Items of Cost	Amount of cost	
	Ordering quantity	
	1000 units (Rs.)	1200 units (Rs.)
Ordering Cost =(A/Q)×C	14,400	12,000
Carrying Cost = (Q/2)×C	10,000	12,000
Additional Cost of facility hired	-	2,000
Total	24,400	26,000

Obviously the organisation would fix its order would fix its order quantity at 1000units, though its optimum order quantity is 1200 units originally. The cost saving is Rs. 1,600/- per annum.

1. Sometimes the supplier may stipulate that orders in multiples of say, 500 units only are acceptable to him. In such cases, the optimal order quantity is to be calculated ignoring the restriction and then the total cost of inventory is computed at ordering quantities satisfying the stipulation immediately above and below the optimal order quantity level. In our case 1000 and 1500 units are the alternative ordering quantities in question. The cost consumption are as under:

TABLE 2

Items of Cost	Amount of cost	
	Ordering quantity	
	1000 units (Rs.)	1200 units (Rs.)
Ordering Cost A × O/Q	14,400	9,600

Carrying Cost Q × C/2	10,000	15,000
Total	24,400	25,600

An order quantity of 1000 units is marginally economical.

2. The supplier may quote differing prices for different order quantities. Let us assume that in our case the supplier quotes the following prices for different quantities of order given under.

Quantity Ordered	Price per Unit
Less than 1000	Rs.100.00
1001-1500	Rs.99.90
1501-2000	Rs.99.75
2000 and above	Rs.99.60

The organisation considers order sizes of 1000, 1200, 1800, 2000 and 2400 units. The computation of optimal order quantity is carried out below:

TABLE 3

Order Size (Q)	Carrying cost Q/2 ×price ×20%	Ordering cost A/QXO	Discount earned AX Discount Rate	Net Cost (2)+(3)+(4)
(1)	(2) (Rs.)	(3) (Rs.)	(4) (Rs.)	(5) (Rs.)
1000	10000	14400	-	24400
1000	11988	12000	3600	20388
1800	17955	8000	9000	18150
2000	19950	7200	9000	18150
2400	23904	6000	14400	15504

The optimum order quantity is that quantity level where the cost of carrying and ordering les the discount earned is the minimum (Discount earned = Annual purchases × Discount per unit). An order quantity of 2,400 units is the optimum level since the net cost is the least here, namely Rs. 15,504.

Stock level techniques

When rate of usage and lead times are varying then we say there is uncertainty (Other uncertainties like price fluctuations, seasonal factors, etc., are not considered). In such cases effective inventory management needs two factors to be satisfied, namely, investment in inventory does not exceed a certain limit and stock out situation does not arise. In other words, the maximum stock level and minimum stock level are to be scientifically fixed taking into account various factors. In situations of this nature, the maximum, average and minimum lead times and usage rates are first computed. Then the different levels of stock are determined.

Reorder level - Maximum lead time × Maximum usage rate

Maximum level - Recorded level + optimum order quantity - (Minimum lead time Minimum usage rate)

Minimum level or Safety level - Recorded level -(Average usage time ×Average usage rate)

Continuing our example given in the very beginning, let us assume the following.

	Usage Rate (UR)in units	Lead Time in days (LT)
Maximum(MAX)	120	11
Average (AVR)	100	7
Minimum(MIN)	80	5

Assuming an opening inventory of 2000 units the order schedule, usage and inventory levels, under the most pessimistic, most optimistic and most likely levels of usage rate and lead time would be as given in Table-4. In the most pessimistic situation the stock level just prior to receipt of the reorder quantity is zero but there is no stock level just prior to receipt of the reorder quantity is zero, but there is no stock-out. However, as stock level approaches 'Zero' the is the potential danger of running out of stock. i.e., as it reaches the danger level, urgent measures to procure materials are called for. Investment in inventory is best utilised here. In the most optimistic case, the usage rate is less and the

delivery of order quantity is most prompt, resulting in relatively maximum stock position throughout. There is more safety here, but at the same time there is piling up the stock. In the most likely situation, there is neither fast depletion nor pile up of stock. Fair level of safety and turnover of stock are ensured.

Table 4

Details	Most pessimistic situation	Most optimistic situation	Most likely situation
1. Assumption on usage	Max LT & Max UR	Min LT & Min. UR	AVR. LT & AVR.UR
2. Opening Stock	2000	2000	2000
3.Less usage to reorder level	680 (reached in 5 days)	680 (reached in 81/2 days)	680 (reached in 6.8 days)
4.Reorder level (Max.LT & Max UR) (New order is placed)	1320	1320	1320
5. Less usage until the receipt of the ordered quantity	1320(11×120)	400(5×80)	700(7×100)
6. Balance just prior to receipt o9f ordered quantity	0	920	620
7. Add: receipt of ordered quantity	1200	1200	1200
8. Present stock position	1200	2120	1820
9. Implications	Potential danger of running out of stock	Stock turn over is very small and cost	Fail degree of usage and safety are

		of stock is more	assured
10. Time of next order	Immediate, since present stock level is below reorder level	Relatively long after since the present stock level is the maximum level	After some breathing time since we present stock lies between the reorder level and the maximum.

It could be seen from the above that the end stock position is influenced by the consumption during the lead time i.e., (URXLT). In the above analysis the cases, with varying levels of consumption having different impact on the end stock. The levels of consumption having different impact on the end stock. The levels of consumption could be anything given by AVRLT X, MAX UR, AVR LTXMIN UR, MAX LTXAVR UR, MAX LTXMIN UR, MIN LTXAVR UR OR MIN LTXMAX UR. But in all these cases the consumptions would fall within the limits set by the most pessimistic and most optimistic situations. Hence, the organisation will not run out of stock, though the stock carried may be slightly excessive in certain cases.

ABC technique

Here, inventory items are analysed into three categories on the basis of total annual cost of each item. 'A' category consists of inventory items whose value outweighs their volume, i.e. value is more, several-fold, than the volume, 'C' category consists of inventory items whose volume outweighs their value, i.e. volume is more, several fold, than value. The 'B' category comes in the middle with moderate volume and moderate value. A rough and ready count puts that 'A' category accounts for 70% of value but only 10% of volume, B category accounts for about 20% of value and 20% volume and 'C' for 10% of value and 70% of volume. In the computation volume percentage different authors adopt different methods. Some count the number of items while others take head-counts of individual items.

'A' category is subjected to closer planning and control. Less planning and control is attached to 'C' Regarding 'B' category a via-made course is adopted. The reasons for this are not far to seek. By closer control of 'A' category inventory costs are reduced. Table 5 gives the planning and control approaches to the different categories of inventory.

TABLE 5: ABC CONTROL TECHNIQUE

Aspect	A Category	B Category	C Category

1.Nature			
a. Total Value	High	Medium	Low
b. Volume	Low	Medium	Low
2. Order			
a. Size	Low	Medium	High
b. Number	More	Medium	Few
3. Storage			
a. Care	More	Medium	Less
b. Records	Complete	Some	Few
4. Issue			
a. Procedure	Stringent	Moderate	Lenient
b. Quantity	Low	Moderate	Large
5. Overall			
a. Planning	More	Medium	Low
b. Control	More	Medium	Low

UNIT V
BALANCED REGIONAL DEVELOPMENT

Dispersion and Problem of Regional Imbalance in India

Learning objectives:

After studying this unit, you should be able to

- **Analyze the objectives of industrialization.**
- **Explain the indicators of regional imbalance.**
- **Describe the distribution of industries.**

❖ **Examine the estimates of regional disparities.**

Introduction :

The main problem faced by most of the countries is of regional imbalances and of the regional inequalities. Both developed and under-developed countries are victimised by a process of regio9nal imbalances. In our country regional variations are present, we see that there are some states which are economically advanced while some are backward and even within each state some are backward and even within each state some regions are more developed while some are undeveloped. As such the coexistence of this form is termed as Regional Imbalance. Regional imbalances may therefore be inter-state or intra-state, total or sectoral.

Regional imbalances may be natural when due to unequal natural endowments or man made in the sense of neglect of some regions and preference of other for investment and development effort Economic backwardness of a region is indicated by symptoms like high pressure of population on land excessive dependence on agriculture leading to high incidence of rural employment, absence or large-scale urbanisation, low productivity in agriculture and cottage industries.

BALANCED TEGIONAL DEVELOPMENT---ITS OBJECTIVE IN TERMS OF INDUSTRIALISATIONS

Sound economic policy is very important for the harmonious development of a country. It is only by assessing the needs of the country that a development plan could be worked, but in a planned economy location of industry is an important factor in the creation of a climate for speedy development and acceleration of economic growth. At the same time it is also necessary to highlight the need for dispersal of industries On strategic grounds a parallel factor to meet the requirement of decentralised development or on social and economic grounds. Regional development as a matter of fact becomes a vital part of the Indian Economic planning. In other words this is the sine-qua non of planned economy on rational lines. Excessive concentration of industries in certain regions is a serious malady of the Indian Economy. In order to avoid this, the device of Regional planning is resorted. "The extremely localised character of industrial activity presents a serious stumbling block to the smooth performance of a National plan ...super imposed on the national plan and becoming part of it there must be a regional plan in each area for dealing especially with the large local residue of unemployment". Regional development may therefore lead to the distribution of employment opportunities in an equitable basis. And they are not let to confine only to a handful of states which are creating gaps in the per-

capita income among different regions. National integrity may be affected with the regional disparities in their prosperity.

Planned utilisation and conservation of scarce resources and exhaustible resources i the good interest of the nation is of prime importance in any type of economy. All efforts should be made through regional development to secure maximum efficiency in the utilisation of available resource rather than the adjustment of rival claims of different areas to achieve their own aim and ambitions. Hence, inter-provincial jealousies are detrimental to the execution of regional plan. Any conflict that may arise in the sectional plans which are complementary to the national plan, should be reduced in the interest of the progress of the nation.

As such regional development aims to bring even development of the economy there by curbing lop-sided development. Certain social objectives may therefore be attained through sectional or regional planning. They may include the leveling of inequity in the per-capita income, the avoidance of emigration of labour and upliftment of backward regions. The very idea behind regional planning is the arresting of growth of agglomeration which will create a few industrial centres or towns which in their turn give rise to housing problem, insanitary climate, moral degradation etc. So there is a persuasive case for 'Balanced Growth' for diversification but within carefully considered limits.

Briefly speaking we may pinpoint the fact that Balanced regional development is essential for harmonious development of under-developed country due to the following reasons:

1. To maintain political stability.
2. To overcome social evils.
3. To develop and conserve resources.
4. To accelerate economic growth.
5. To reduce inequality in income.
6. To promote employment opportunity.

INDICATORS OF REGIONAL IMBALANCE

1. **Per Capita Income:** It is commonly used in assuming the economic position of agriculture growth and industrial development has contributed to difference in the growth of per-capita income.

States like Punjab and Haryana have achieved high rate of agriculture productivity due to high proportion of area irrigated and high level of fertilise3r used. The per-capita income of Bihar is at bottom and that of Punjab at the top. The regional disparities instead of being reduced are widening.

2. **Population Below Poverty Line:** The population below poverty line also creates regional imbalance. Due to strong production base the percentage of poverty n states of Haryana and Punjab is low.

3. **Electrification:** Power is a necessary pre- requisite for development and the states in which the power development process is not proper; they find obstacles in growing rapidly. Some states even today don not have cent percent electrification, for example like Assam, Bihar, Rajasthan and Arunachal Pradesh are lagging behind in this field.

4. **Agriculture Output Per Capita:** The agriculture production yield and techniques also differ widely from regions to region. States like Punjab and Haryana have progressed in agriculture production while states like Assam, Orissa, and Nagaland still use primitive methods of production.

5. **Urbanisation:** It is an important indicator of economic development. Percentage of Urban population was higher in states like Maharashtra, Tamil Nadu, Gujarat and Karnataka but lower in states like Orissa, Assam, Nagaland and Himachal Pradesh.

6. **Transport and Communication:** Another important indicator of regional imbalances is disparity found in availability of facilities relating to transport and communications, banking, insurance, public health and education. States like Punjab, Haryana, Maharashtra are well endowed with these facilities whereas regions like Assam, Bihar, Orissa are deficient in the same.

7. **Industrialisation:** The level of industrialisation attained by different states is also different. In Bihar, Orissa, M.P., Rajasthan share of industries in total income is low, i.e.,(between 10 to 12%) whereas it is high in Maharashtra, Bengal, Punjab. The heavy dependence on agriculture has opposed the industrialisation.

8. **Lack of Finance:** Lack of finance is another hindrance in the smooth development of any region. Financial institutions feel shy to finance various development activities schemes on account of non-recovery of their fund. As a result these regions remain backward.

9. **Political Pressures:** It has been correctly observed that political parties interfere in the process of development. In fact they want to bring catchy projects in their

area only to influence the vote bank. This type of interference hinders the needy development of an area.

CAUSES OF ECONOMIC BACKWARDENESS AND REGIONAL IMBALANCES

There are deterrent factors which come in the way of rapid development of region most important of these are geographical isolation, inadequacy of economic overheads like transport, labour, technology etc. Let us now analyse some of these factors.

1. **Historical Causes:** It has been assumed that regional imbalance started occurring even since the British Rule. Britishers settled first in Mumbai, Kolkata, Chennai and therefore these states developed first. Maharashtra and West Bengal which also possessed potential form of manufacturing and trading activities required generous attention from British Industrialist and Businessman and made progress in this field.
2. **Encouragement by Government:** Government encouraged in the form of incentives, credit and other facilities to the entrepreneurs to attract maximum investment such that those regions go ahead leaving other states behind which lacked the special governmental attention. Therefore, encouragement by the government was responsible for regional planning of a region.
3. **Natural Causes:** Some regions owe their progress to nature. Punjab has rich fertile land while Rajasthan lacks this. Cities like Mumbai, Chennai and Kolkata basically developed due to their geographical location, on the other hand hilly areas remained backward owing to their topographic features.
4. **New Technology of Agriculture:** The use of new agriculture technology is very much responsible for widening inter-regional disparities. Those states like Punjab, Haryana, U.P. and some parts of Tamil Nadu adopted new technology which led the states to progress.
5. **Attitude and Qualities of People:** Wherever people are skillful, and hardworking; states become progressive as compared to those states in which people lack these qualities For example, Punjab, Haryana, Maharashtra are more proficient in business than that of Bihar and Orissa.
6. **Infrastructure:** The regions in which infrastructure is sound has developed fast, as against those states which lacks good infrastructure.

ESTIMATES OF REGIONAL DISPARITIES

The Economic and Scientific Research Foundation showed that over the decade 1960-67 agricultural income from crop production registered a very high growth rate in case of already developed states. The national average agricultural income showed an increase of 142.6%, Punjab topped with growth of 224.2%, followed by Haryana 223.5%, Gujarat 203% and Rajasthan 200%. The rate of increase in Mysore, Orissa, Jammu and Kashmir and Kerala was also more than the national average while all other states were below the national growth rate.

Another estimate was made by Economic Times regarding poverty in different states. It revealed that nine states had more than 48.13% of their population below the poverty line in 1977-78. These states were Orissa, Tripura, M.P, Bihar, West Bengal, Tamil Nadu, Assam, U.P. and Karnataka. The richest state Punjab with per-capita Net, State Domestic product of Rs. 2,278 had the lowest 15.13% of its population below poverty line followed by Haryana which had 24.84%.

"**Prof Raj Krishna** made six categories of state disparities as such:

i. Indicates of Income, Poverty and Unemployment.
ii. Agricultural Indicators.
iii. Industrial Indicators.
iv. Infrastructure Indicators.
v. Social Service Indicators.
vi. Resource allocation indicators.

There is gross imbalance in the regional location of Industries in the country. The major industrial states of India are Maharashtra, Tamil Nadu, Gujarat, West Bengal, and Andhra Pradesh. They jointly accounted for 40% of total location of large industries, 55% of total industrial employment, 59% of total industrial output and 57% value-Added. On the contrary of all other states and Unions territories jointly accounted the remaining 60% of total location of large industries 45% of employment, 41% of output and 42% of value. Added. Therefore, the present trends showed that industrial rich state achieved higher rate of progress while others remained backward and there is uneven spatial distribution of industries. However the states like Punjab, Haryana, Kerala and Karnataka have recorded remarkable progress in small scale sector (see Tables).

These tables reveal disparities.

Table: Concentration of scale industries in a few large cities

Industries	**Main metropolitian centres around which development took place.**
(i)Textile machinery	Ahmedabad ,Baroda, Mumbai, Kolkata
(ii) Machine tools	Bangalore and Pune
(iii) Telecommunication and electronics	Bangalore and Hyderabad
(iv) Railway coaches	Chennai and Bangalore
(v) Automobiles companies, jeep	Mumbai ,Kolkata ,Chennai ,Pune
(vi) Precious Instrument	Mumbai and Kolkata
(vii) Electrical goods	Chennai, Pune, Mumbai, Kolkata ,Delhi
Small machineries	Mumbai ,Delhi, Chennai
Locomotive	Chittaranjan and Jamshedpur
Defence equipment scooters etc.	Kanpur, Chennai ,Pune, Mumbai
Diesel engine	Pune
Pharmaceutical	Baroda and Mumbai
Basic industries	Kota and Rourkela
Fertiiiser and antobiotics	Delhi ,Pune, Mumbai, Ahmedabad

Identification of Industrial backward areas Policy measures to remove regional disparities

REGIONAL DISPARAITY AND ECONOMIC PLANS

Balanced development of all regions and state is necessary to draw available human and material resource throughout the country into the development process and to enable people in all regions to share the benefits of development. It was seen that though in the First-plan problem of regional disparities got no attention it was the Second plan and Third plan which gave importance to see that industries should be located in less developed area.

In 1968, National Development Council considering the problem of Regional Imbalances recommended the following criteria for the identification of industrially backward states and union territories:

1. Total per capita Income together with the contribution of Industry and mining.

2. Number of workers in factories per lakh of population.
3. Per capita Annual consumption of electricity.
4. Length of surfaced roads in relation to population and area of the state.
5. Railway mileage in relation to the population and the area of the state.

The National Development Council appointed two working groups (a) The Pandey working grouping to identify industrially Backward states and (b) The Wanchoo working group to recommend fiscal and financial incentives for starting an industry in Backward area. Let us analyse their reports.

Pande Committee Report

The Pande Committee has laid down the following criteria for the identification of industrially backward states as well as backward states as well as backward district:

i. Total per capita income.
ii. the per capita income for from industry and mining.
iii. Number of workers in registered factories.
iv. Per Capita annual Consumption of electricity.
v. Length of surfaced roads in relation to the population and area of the state.
vi. Railway mileage in relation to the population and the area of the state On the basis of the above criteria the committee has identified the states of A.P. Bihar, M.P., Orissa, Rajasthan, U.P., Assam, Jammu and Kashmir, Nagaland, as Backward. Coming to the district level the committee recommended the following criteria for the identification of backward districts.

1. District beyond a radius of about 80 km to large cities or large industrial projects.
2. Poverty as indicated by low P.C.I.
3. High density of population in relation to utilisation of productive resources and employment opportunities.
4. Low percentage of population engaged in secondary and tertiary activities.
5. Low percentage of factory employment.
6. Low utilisation of economic and natural resources like minerals and forest and
7. Adequate availability of electric power, transport, and communication and water.

The Pande committee further desired that these criteria be made applicable only to backward districts in Backward states. The distinction by this committee between

backward state and backward areas in developing states was not accepted by the planning commission though it was agreed for the purpose of grant of incentives that backward states should select two districts for development whereas a developed state should select only one. The limitation of available fund was obviously the deciding factor.

Wanchoo Committee

The Wanchoo committee recommended the following fiscal incentives for industries set up in backward areas.

1. Grant of higher development rebate.
2. Exemption from income tax including corporate tax for five years after providing the development rebate.
3. Exemption from import duties on plant, machinery and components.
4. Exemption from excise duties for five years.
5. Exemption from sales tax both on raw material and finished products for five years from the data of going into production.
6. Grants of transport subsidy for the dispatch of finished products for five years. (No subsidy has been recommended upto9 a distance of the 640 km) and the subsidy has been recommended only in areas of difficult communication.

The Central government after considering the recommendation of the Pande and Wanchoo committee announced two schemes in 1971 for providing financial assistance and transport subsidy to the Entrepreneurs intending to establish industries in the selected backward areas. Simultaneously, the national financial institution also decided to offer finances at concessional terms for units establishing industries in backward regions.

The industrial policy (1956) stated thus that 'The lack of industries in different parts of the country is very often determined by factors such as the availability of the necessary raw material or other natural resources. A concentration of industries in certain areas has also been due to the ready availability of power water supply, transport which has been developed there. Since then development of backward areas and regional disparities has continued to be one of the principal objectives of industrial policy of the Government of India.

Eighth five years plans documents stated that some sigh of improvement in certain less advanced states have been observed. Regional, disparities continue to exist even in eighties. Development institutions and organisational capabilities in the backward regions of the country and the delivery system for development programs would need to be strengthened to deal effectively with the problem of development and redistributive justice.

To take the problem of regional imbalances and backwardness a threefold strategy was adopted by the Indian planning commission.

They were:

1. The recognition of backwardness as a factor to be taken into account in the transfer of financial resources from the centre to the states.
2. Special area development programme formulated for the development of backward areas.
3. Measure to promote private investment in backward areas. Let us discuss the three-fold strategy in detail.

1. Transfer of Resources to Backward Areas

The resource transfer relates to central assistance for state plans-transfers effected under the recommendation of the finance commission, adhoc transfers from the centre to the states the distribution of long-term and, short-term credit from financial institution. The share of backward states in plan outlay and in central assistance steadily rose from 48% in the first plan to 57% in the third plan since then share of backward states in central plan assistance has been declining to 50% in the fifth plan, 46% in the sixth 37% in the eighth plan. The tenth plan has further projected a decline to 36% Refer to Table Many states demanded that the proportion of central assistance should be raised to 25% from 10%.

Table: Central assistance to state plans (1980 - 2007)

Plans	**Total assistance in all states (Rs crores)**	**Total Assistance to backward states (Rs crores)**	**Percentate of assistance to backward states**
Sixth Plan (1980 - 85)	16,560	7,590	46
Seventh Plan (1985-90)	31,420	13,200	42
Eight Plan (1992-97)	93,830	35,160	37
Ninth Plan (1997-02)	185,260	69,990	38
Tenth Plan(2002-07)	2,54,100	91,080	36

In fact, there is certain major lacuna to solve the problem of regional disparities through transference of resources. There is no guarantee that resource as transferred from the centre to the states would be automatically used for the development of the backward areas. In fact it may be diverted to development of forward areas.

2. Special area Development Programme

Special plan schemes have been formulated with central assistance to develop hilly areas, drought - prone areas and tribal areas. Moreover schemes of rural development directed towards the improvement of specific groups like small farmers and agricultural labourers and for those were also located in backward areas. In course of time these special schemes for particular target groups became a part of the programme of block level planning for integrated rural development and employment. An area based approach of Tribal Sub Plan is now being implemented for the development of scheduled tribes located in the backward rural areas. The tribal sub-plans are implemented through 194 Integrated tribal Development Projects. (ITDP) and 250 modified Area Development Projects.

3. Incentives to Promote Investment in Backward Region

In order to promote private investments in backward regions various fiscal and other incentives have been given by the centre to the states and other financial institution under public sector.

These incentives are:

Central Government Incentives

a) **Income Tax Commission:** New industrial units located in backward areas set up after January, 1971 are allowed a deduction of 20% of Profits for computation of assessable income. This concession was started in April, 1974 for ten years in industrial units.

b) **Tax Holiday:** The 1993-94 budget introduced a system of Tax Holiday for new industrial units located in backward regions *i.e.* in all states in N.E. Region of Jammu and Kashmir, H.P., Sikkim, Goa and the Union Territories of Andaman and Nicobar Islands, Dadar and Nagar Haveli Daman and Diu

c) **Central Investment Subsidy Scheme:** The Central Government announced the scheme of central investment subsidy in 1970. It made provisions for outright subsidy at the flat rate of 10% subject to a maximum limit of Rs. 5 lakhs on fixed capital investment like land, factory, building. The rate of subsidy was raised to

15% and then to 25% since April, 1983 the following pattern of Investment subsidy is being followed.

i. **Category A areas(No industry districts and special regions):**

25% investment subsidy be provided subject to a maximum limit of Rs 15 lakhs.

ii. **Category B areas:** 15% investment subsidy be provided subject to a maximum limit of Rs. 15 lakhs.

iii. **Category C areas:** 10% investment subsidy be provided to a maximum limit of Rs. 15 lakhs. By April 1984 the maximum limit of investment subsidy was raised to Rs. 50 lakhs to be fixed at the rate of 25% for electronic industry settled in *hilly districts* in *category A.*

d) **Transport Subsidy Scheme:** In July 1971 this subsidy was introduced for those industrial units established in hilly, inaccessible, remote areas of the country. As per this scheme these aforesaid industrial units were entitled to 50% transport subsidy on the expenditure incurred particularly for movement of raw materials and finished goods in certain selected rail heads to the location of industrial units.

e) **Promotion of New Financial Institutions of Backward Regions:**

In order to bring industrialisation to backward areas the Government of India has promoted new financial institutions especially in backward regions. Government established Regional Rural Development Bank for the north - eastern region in 1995-1996.

Moreover, the Government of India also established a rural infrastructure development fund within NABARD from April 1995 for the infrastructure development of rural and backward areas.

MISCELLANEOUS MEASURES

The central Government has been introducing some miscellaneous measures for promoting less developed regions. The Government has granted liberal concessions to MRTP/FERA Companies for setting up particular type of industries located in backward areas.

1. State Government Incentives

The Government has been incentive in various forms. These incentives include providing plots with electricity, water connection on a no profit, no loss basis exemption from payment of water charges for some years. Sales tax exemption, interest free loans, exemption from octroi duties, exemption from payment of property taxes for initial years

providing subsidy on industrial housing scheme, establishing industrial estate for setting up small industries. The institution like SFC SIDCO and SIICS has sanctioned loans under concessional financial scheme, which had gone to backward districts.

2. Concessional Finance Available from Major Financial Institutions

Example of IDBI, IFCI, ICICI These institutions are giving loans at concessional rates of interest at longer period repayment facilities, participate in the risk capital or debenture issues, waiving off commitment charges. Moreover these institutions are preparing feasibility study of industrial projects to be located in prospective entrepreneurs to implement such projects. Moreover these institutions are setting up technical consultancy organisation to give technical consultancy services to prospective industrial limits of backward areas at cheaper rates.

Tenth Five Year Plan and Regional DIsparities

As states with better infrastructure generally attract private investment in much larger measure than other States. *The tenth plan adopted a multipronged strategy to accelerate the development of less developed states and backward regions within developed states. Accordingly, the tenth plan strategy was:*

a) High level of capital investment: A high proportion of central assistance and states over resources would be devoted in improving infrastructure gap in less developed states.

b) Funds alone cannot address backwardness but development effort should be accompanied by:

i. Government and institutional reforms to make the targeted investment effective.

ii. Decentralisation of powers and functions to local bodies to set a pattern of development more in tune with their aspirations.

iii. Strengthening of people participation to make development efforts really meaningful.

The tenth plan formulated a new scheme called Rashtriya sam vikas Yojana (National equal development plan) in 2002-2003 with the specific focus on development programmes for backward regions, which helped to reduce imbalances, speed up development and overcome poverty and unemployment in backward regions. RSVY is purely a grant based programme and acts as an incentive for states to take up reforms. These grants would be in addition to existing flow funds undergoing schemes. The release of funds was performance based.

Reasons for Regional Planning Failed to Remove Regional Imbalance

1) Refusal by rich state to transfer resources to poor state.
2) Lack of self-reliance on the part of poorer state and there by too much dependence on the transfer of resources from richer state.
3) Area development programmes for backwards areas are lacking an integrated approach.
4) Failure of large central projects to be called in the backward areas to improve their economies.
5) Non-approaching attitude of the entrepreneurs to seek concessional finance from the public sector financial institutions.
6) Too much concentration of central Government subsidy meant for specific backward areas into a few areas of some districts and too much of such investment subsidy on capital related investments leading to creation of lesser employment opportunities.
7) Inadequate fund provided by State Government for tackling the problem of Intra-State imbalances existing within a state.
8) Non-utilisation of plan outlays and loans and advances given to the state for the development of backward areas.

SUGGESTIONS

The planning commission in India has sought to tackle the problem of regional disparities and backwardness.

1. The procession of adequate fund should be available by the *Centre to states for the backward areas according to their needs and importance.* The responsibility of developing the areas should be entirely left to the state except in the case of very large project requiring huge investment.
2. *Separate development programme* for each region. In the backward regions of U.P., Bihar plains where the populate is large the development programme should follow from technical breakthrough in agriculture and water and improvement of transport and communication and of social and institutional reform. While in regions like Rajasthan, the programme should train local youth for emigration to adjoining regions of better economic opportunity where projects or development of natural resources can be started.

CONCLUSION

The steps taken to resolve the problem of regional imbalances have been largely in financial terms. In fact central assistance should be linked with specific programmes for the development of the relatively backward regions. Besides the financial approach should be replaced by the planning approach under which the backward regions should be clearly identified along with their capabilities and potentialities so that separate agencies be adopted for each backward regions. This is therefore necessity to see that agricultural, industrial and infrastructure development all be coordinated. Only then development of backward area shall take place.

Advertising Industry	Advertising is one of the key activities for potential business and is equally important as producing something using raw material, or as capital, manpower, planning, organizing etc. Publicising the products or services that the business offers to the targeted customers is called Advertising.
Agriculture Industry	Indian 'agro' or 'agriculture' marks the beginning of 'civilized' or 'sedentary' society. Climate change and increase in population in the country during the Holocene Era (10,000 BC onwards) led to the evolution of agriculture.
Aluminium Industry	Indian Aluminium Industry was first established in the year 1808 and it took almost 46 years to make its production commercially viable. The research work took several years resulted in extracting the Aluminium from the ore.
Automobile Industry	Indian automobile industry mainly focusses on servicing, dealership, financing and maintenance of vehicles. The Indian Automobile industry includes two-wheelers, trucks, cars, buses and three-wheelers which play a crucial role in growth of the Indian economy.
Aviation Industry	Indian Aviation Industry has been one of the fastest-growing aviation industries in the world with private airlines accounting for more than 75 % of the sector of the domestic aviation market.
Banking Industry	Indian Banking Industry's growth has been more qualitative than quantitative which is expected to remain the same for the coming years.Indian Banking Industry originated in the first decade of 18th century as The General Bank of India came into existence in the year 1786.The India’s oldest bank which is in existence is the State Bank of

	India.
Biotechnology Industry	Government of India set up the Department of Biotechnology (DBT) under the Ministry of Science and Technology in 1986 with the aim of enhancing the Biotech Industry in India. Since then DBT has produced one of the best scientists of the country.
Biscuit Industry	India Biscuits Industry seems to be the largest among all the food industries and has a turn over of around Rs.3000 crores.Indian subcontinent is known to be the second largest manufacturer of biscuits, the first being USA.
Cement Industry	India Cement Industry is the second largest cement producer in the world after China with a total capacity of 151.2 Million Tones (MT). Government of India has been giving immense boost to various infrastructure projects, housing facilities and road networks, that the cement industry in India is currently growing at an enviable pace.
Chocolate Industry	Indian Chocolate Industry as today it is dominated by two companies, both multinationals. The market leader is Cadbury with a lion's share of 70%. The company's brands like Five Star, Gems, Eclairs, Perk, Dairy Milk are leaders in their segments.
Coir Industry	Indian coir industry has been fortunate to get boost in the form of the ever increasing awareness about eco-protection. Coir, being a natural fibre which is environment-friendly is the fiber of the future.
Construction Industry	Construction usually is done or coordinated by general contractors, who specialize in one type of construction such as residential or commercial building. Cost structure of the construction industry is dominated by raw material cost and subcontracting cost.
Copper Industry	The Indian Copper Industry consisted of a single state-owned company and now the copper industry in India takes up about 3 % of the entire world market for copper.
Cosmetic Industry	While the demand of beautifying substances called cosmetics are growing day by day, a large number of local as well as international manufacturers are gradually extend their ranges and products in different provinces of India.

Cottage Industry	Indian Cottage industry is generally an unorganized sector and falls under the category of small scale industry. The industry produces consumable products through the use of conventional methods.
Cotton Industry	The Indian Cotton Industry provides sustenance to million of farmers as also the workers involved right from processing to trading of cotton. The Indian textile industry is predominantly cotton based.
Dairy Industry	India is the highest milk producer in the entire globe. India is well known as the 'Oyster' of the global dairy industry, with opportunities galore for the entrepreneurs globally.
Diamond Industry	Indian Jewelry is made scrupulously by hand and was traditionally crafted by family jewelers skilled in a particular style. India`s artisans with traditional skills dominate contemporary techniques to provide the world with jewelry that conform to international standards.
Electronic Industry	Indian Electronics industry dates back to the early 1960s. Electronics industry includes development and maintenance of fundamental communication systems including radio-broadcasting, telephonic and telegraphic communication, and augmentation of defense capabilities.
Fashion Industry	Indian Fashion Industry India is at its infancy at the moment and has great potential to make the mark on the world stage. Fashion in India has thousands of years of tradition behind it.
Fertilizer Industry	Fertilizer is defined as any substance which is organic or inorganic, natural or artificial, supplies one or more of the chemical elements required for plant growth. Today the Indian fertilizer industry in the past 50 years has grown in size and stature as it ranks third in the world.
Film Industry	Indian Film Industry is just not restricted to fun and entertainment and earning profits but is also one of the biggest employment generating industries of the Indian economy. Today the growth of this industry is quite phenomenal with the changing preferences of movie-goers and filmmakers.
Food Processing Industry	Indian Food Processing Industry covers fruit and vegetables; meat and poultry; milk and milk products, alcoholic beverages, fisheries,

	plantation, grain processing, consumer products groups like confectionery, chocolates and cocoa products, Soya-based products, mineral water, high protein foods, etc.
Furniture Industry	India is a land of wonderful and marvelous artistic work of wood which is being appreciated worldwide. The rich Indian handicraft and beautiful traditional attributes of art and design have established a reputation for Indian Furniture Industry in the nation and worldwide.
Garment Industry	India's Garment Industry is a well-organized enterprise and is among the best in the world. It constitutes of designers, manufacturers, exporters, suppliers, stockists and wholesalers. Indian Garment Industry has carved out a niche in the global markets and earned a reputation for its durability, quality and beauty.
Granite Industry	India is one among the leading countries in mining and export of granite and is rich in granite reserves. Geologically, the southern and eastern belts of the Nation are abundant in granite deposits.
Health Care Industry	Indian health care industry growth story is moving ahead neck to neck with the pharmaceutical industry & the software industry of the nation.
Hotel Industry	Indian Hotel Industry is set to grow by 15% a year. Over the last decade business opportunities in the country India had intensified and elevated room rates occupancy levels in India.
Insurance Industry	Indian Insurance Industry has got the deep-rooted history. In India the advent of Life Insurance started in the year 1818 with the establishment of the Oriental Life Insurance Company in Calcutta.
IT Industry	Indian Information Technology industry is one of the fastest growing industries in the country. The IT industry has built very valuable brand equity for itself in the global markets.
Jewellery Industry	India has a glorious history which affects each and every aspect of Indian lifestyle. Jewelry has always remained an integral part of the Indian lifestyle. The diverse history of India has great influence on the jewelry styles as well.

Jute Industry	The Indian Jute Industry is a very old & predominant in the eastern part of India. The Government of India has included the Jute Industry for special attention in its National Common Minimum Programme.
Leather Industry	Indian Leather Industry has developed to a large extent and is the second largest producer next to China. The industry is equipped mostly with a potential for employment generation, growth and exports, with the annual exports touching 2 billion USD.
Mining Industry	Indian Mining Industry has been a major mineral producer in Asia and globally. Currently it is the global producer of chromite, coal, iron ore and bauxite while enjoying economic growth during the nineties. Mining is over 6000 years old in India.
Music Industry	Indian Music Industry has a rich musical tradition and one is capable of generating sizeable revenue for the country in every genre of the music industry. There are lot of loopholes in the industry due to the unabated growth of piracy.
Mutual Fund Industry	The Indian Mutual funds Industry had a rapid growth as a result of infrastructural development, increase in personal financial assets, and rise in foreign participation.
Oil Industry	Indian Oil and Gas Industry have been successful in fuelling the rapid growth of the Indian economy. The origin of Indian Oil & Gas Industry can be traced back to 1867 when oil was struck at Makum near Margherita in Assam.
Paint Industry	There is a phenomenal growth on the housing sector front with rapid urbanization and availability of easy to secure housing loans and this has become the prime driver of growth in the decorative paint segment, which comprises 70% of the Indian Paint industry.
Paper Industry	Indian Paper industry has created sustainable livelihood in rural areas and has helped generating employment for the local population especially for women to earn their livelihood.
Pearl Industry	The traditional areas which had produced natural pearls are located in the Gulf of Mannar and Gulf of Kutch. The Central Marine Fisheries Research Institute of the Government of India has succeeded in

	culturing pearls.
Pharmaceutical Industry	Indian pharmaceutical market in 1970's was almost non-existent. Today, India has gained immense importance and carved a niche for itself in the pharmaceutical domain. In fact, it has emerged as a big mart for the pharmaceutical industry.
Plastic Industry	Ever Since 1957 the Plastics Industry in India has made significant achievements as it made a modest but promising beginning by commencing production of Polystyrene. The Indian Plastic industry is facing severe demand crunch.
Poultry Industry	Poultry Industry in India is constantly on the rise due to the use of modern techniques and changing from live bird to fresh chilled and frozen product market.
Power Industry	The Indian Power Industry plays a critical role in the economic progress of the country and has to be emphasized. The Power Ministry of India has set up Power Finance Corporation of India that is mainly responsible for the financing of the power sector in India.
Printing Industry	Indian Printing Industry has undergone many revolutionary changes in the past 15 years. India is becoming one of the major print producer & manufacture of printed paper products for the world markets. The Printing Industry's quality standards have improved dramatically.
Railway Industry	The first step for the rail system in India was put forward in 1832. Then a decade later in 1844, then the Governor-General of India Lord Hardinge allowed private entrepreneurs to set up a rail system in India. Today Indian Railways Industry is one of the largest rail networks in the world.
Real Estate Industry	The Indian Real Estate Industry in the country is one of great importance and according to a technical report there is an estimated shortage of 26.53 million houses.
Retail Industry	Today India is the fifth largest in the world in terms of Retail Industry. It is one of the fastest growing industries, especially over the last few years. Though initially, the retail industry in India was mostly unorganized.

Rubber Industry	Indian rubber industry has been growing in along with the strength and importance, as a part of India's burgeoning role in the global economy.
Shipping Industry	The Indian shipping Industry plays a crucial role in Indian economy. As 90% of the nation's trade by volume is done via sea. India has been the largest merchant shipping fleet among the developing nations.
Silk Industry	India is the second largest producer of silk, contributing to about 18 % to the world production. However India's requirement of raw silk is much higher than its current production.
Soap Industry	People belonging to different income levels use different brands, which fall under different segments, but all income levels use soaps, making it the second largest category in India. Soaps are categorized into men's soaps, ladies' soaps and common soaps.
Solar Industry	India's demand for solar products has been rapidly rising for the recent years, especially in rural areas, and is expected to continue growing substantially in the years to come.
Steel Industry	India is on an upswing when speaking about the Steel Industry because of the strong global and domestic demand. The rapid economic growth and progressing demand by sectors like infrastructure, real estate and automobiles, at home and abroad, has put Indian steel industry on the Global Map.
Sugar Industry	Sugar is made from sugarcane, was discovered thousands of years ago in New Guinea. And then the route was traced to India and Southeast Asia.
Tea Industry	Indian Tea Industry is about 172 years old. The industry occupies an important place and plays a very useful part in the national economy.
Telecom Industry	Indian Telecom Industry started in 1851 when the first operational land lines were laid by the government near Calcutta.
Television Industry	Indian Television Industry has been in existence for nearly s four decades. Initially for the first 17 years, it spread haltingly and transmission was mainly in black & white. Now the Television

	industry has grown by leaps and bounds.
Textile Industry	Indian Textile Industry occupies a unique place in our country. It is among one of the industries which were earliest to come into existence in India.
Tobacco Industry	In India Tobacco is an important commercial crop grown. Tobacco Production occupies the third position in the world with an annual production of about 725 Million Kgs.
Tourism Industry	India's tourism industry is experiencing a strong period of growth which is derived by the burgeoning Indian middle class and high spending foreign tourists with coordinated government campaigns to promote 'Incredible India'.
Toy Industry	Indian Toy industry is large and growing which needs more organized approach to face the challenges of factor distribution & marketing.
Tractor Industry	Tractors are an integral part of mechanization and have a crucial role to play in increasing agricultural productivity. In 1961 the tractor manufacturing in India started, and the industry has grown at a phenomenal pace in the last five decades to achieve a record production of over three lakh units per year.
Turbine Industry	Indian Turbine Industry is growing rapidly as wind energy is the fastest growing source of renewable energy in the country.
Weaving Industry	Indian Weaving Industry has conventionally been one of the most promising sectors of huge employment. In fact, after agriculture, the Weaving Industry is largest provider of work force.
Zinc Industry	Indian zinc industry consists primarily of two gaint players in the market, namely Hindustan Zinc and Binani Zinc. Hindustan Zinc is a producer which is integrated having its own mines and has a market share of more than 60%

Model Question :

1. **What are the objectives of industrialization?**
2. **Write short note on the indicators of regional imbalance.**

3. **Briefly explain the distribution of industries.**
4. **Discuss the estimates of regional disparities.**

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