

***ECONOMICS OF BUSINESS AND
FINANCE***

VI SEMESTER

CORE COURSE (ELECTIVE)

BA ECONOMICS

(2011 Admission)



UNIVERSITY OF CALICUT

SCHOOL OF DISTANCE EDUCATION

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SCHOOL OF DISTANCE EDUCATION

STUDY MATERIAL

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BA ECONOMICS

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ECONOMICS OF BUSINESS AND FINANCE

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SYLLABUS

Module 1: Introduction:

Basic concept of Business Economics, Financial Economics and Managerial Economics.

Module II: Investments:

Meaning, nature and importance. Considerations in Investment decision and investment process – Investment alternatives – Capital Budgeting – Introduction and methods

Module III:

Organising Financial asset, various financial assets and securities. Introduction to Balance Sheets – Evaluation of Balance Sheets – Break even Analysis – Linear and nonlinear – time value money, Future Value and Compounding – present value of discounting.

Module IV:

Introduction to Demand Estimation, Demand forecasting – Production Function and its importance – Cost estimation, Cost functions – Economies of Scale, Cost cuts and estimation, Cartel ,price leadership, price discrimination, pricing strategies.

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MODULE 1

INTRODUCTION

Nature of Business Economics

It is widely accepted fact that business decision-making process has become increasingly complicated due to ever-growing complexities in the business world. This growing complexity of business decision making has inevitably increased the application of economic concepts, theories and tools of economic analysis in this area. The reason is that making an appropriate business decision requires a clear understanding of market conditions, the nature and degree of competition, market fundamentals and the business environment.

Managers everywhere have to take decisions. They face situations daily which require decision making ability. The nature of these problems is mainly economic, that is, making the best of the available resources. There may be several alternative courses of action available for the manager. He may have to decide in favour of one of them to achieve the desired or set objective of the firm. The manager's decision must lead to the most efficient use of available funds or resources in the form of capital, land and labour. Managers have to take decisions on the expansion of existing plants or setting of new ones. Forward planning or planning for the future becomes an integral part of the managerial decisions. Thus, decision making and forward planning are the two vital functions of managers. The economic laws and tools of economic analysis are now applied a great deal in the process of business decision making. This has led to the emergence of a separate branch of study called business or managerial economics. Business Economics can be broadly defined as a study of economic theories, logic and tools of economic analysis that are used in the process of business decision making. It is a discipline which deals with application of economic theory to business management. Thus, business economics lie on the borderline between economics and management and serves as a bridge between the two disciplines. Business economics helps managers in decision making and forward planning.

According to E Mansfield, "managerial economics is concerned with the application of economic concepts and economics to the problem of formulating rational decision making". Evan J Douglas have defined business economics as "the application of economic principles and methodologies to the decision making process within the firm or organisation under the conditions of uncertainty". Spencer and Siegelman have defined business economics as "the integration of economic theory with the business practice for the purpose of facilitating decision making and forward planning by management". According to McNair and Meriam business economics "consists of the uses of economic modes of thought to analyse business situations". In the words of McGuigan and Moyer "managerial economics deals with the application of economic theory and methodology to decision making problems faced by public, private and not-for-profit institutions".

Business economics is, thus, that part of economics that can be conveniently used to analyse business problems to arrive at rational business decisions. The problems of course relate to choices and application of resources, which are basically economic in nature and are faced by managers all the time. The above definitions clearly show that economic theories make a useful contribution in decision making and forward planning. These theories enable firms, whether business or non-business, to arrive at rational solutions that would lead to efficient use of resources. Since business economics is concerned with the analysis of and finding optimal solutions to decision-making problems of businesses/firms, it is essentially microeconomic in nature.

Basic Concepts in Business Economics

There are a number of basic concepts which lie at the heart of business economics and managerial decision making. The most important of these are the following.

- 1) Resource Allocation
- 2) Opportunity cost
- 3) Marginal analysis
- 4) Business objectives
- 5) Time dimension
- 6) Economic efficiency and Equity
- 7) Risk and uncertainty
- 8) Externalities
- 9) Discounting
- 10) Property Rights

(1)Resource Allocation

Economics is concerned with the efficient allocation of scarce resources. Scarce resources are to be used in utmost efficiency to get the optimal results. Resources are the means to achieve to achieve certain ends. Resource allocation refers to the way in which the available factors of production are allocated among the various uses to which they might be put. When purchasing raw materials, employing labour and undertaking investment decisions, the manager is involved in resource allocation. Decision needs to be made in three levels, namely

- a) What goods and services to produce with the available resources
- b) How to combine the available resources (inputs) to produce different types of goods and services
- c) For whom the different goods and services are to be supplied

The above production decisions are sometimes described as the allocative, productive and distributive choices which exist in economies. In business economics, we examine how the price mechanism relates to making of these choices.

(2) Opportunity Cost

Underlying business decisions is the fact that resources are scarce. This scarcity can be reflected in many ways, such as shortages of capital, physical and human resources and time. The existence of scarcity means that whenever a decision or choice is made, a cost is incurred. Such costs are called opportunity costs. The opportunity cost of any activity is what we give up when we make a choice. In other words, opportunity of anything is the next best alternative that could be produced instead by utilising the same amount of resources costing same amount of money. Thus, opportunity cost of a decision is the cost of sacrificing the alternatives to that decision. The question of sacrificing arises because of the fundamental economic problem of scarcity which forces a manager to choose the best out of the available alternatives. That is, sacrifice of alternatives involved when carrying out a decision requires using a resource that is limited in supply with the firm.

Choosing the best automatically means leaving behind all the remaining alternatives. A decision is cost free if it involves no sacrifice. That is, if a resource has no alternative use, then its opportunity cost is nil. But when a businessman invests his own capital in a business its opportunity cost can be measured in terms of the interest he would have earned by lending that money to somebody. Similarly, when he devotes his time in organising his business, the opportunity cost may be measured in terms of the salaries he would have earned from some employment elsewhere.

(3) Marginal Analysis

The idea of opportunity costs highlights the fact that choices have to be made regarding what to produce. The concept of margin reminds us that most of these choices involve relatively small increases or decreases in production. The concept is central to most economic decisions. Marginal analysis is concerned with finding out the change in the total arising because of one additional unit. Consumers, through their purchasing decisions must decide whether or not buying a particular product will add more to their utility than spending the same amount on some alternative. This gives rise to the notion of 'marginal utility'. Similarly, at the heart of managerial decision making is the question of whether or not the increase in output will provide enough extra revenue to compensate the extra cost of production. This gives rise to concept of 'marginal product, marginal revenue and marginal cost'. Since the resources are scarce in relation to demand, managers have to be careful about utilising each and every additional unit of resources. For example, if one has to decide whether an additional man-hour or machine-hour is to be used it is necessary to find out what is the additional output expected from it. Similarly, a decision about additional investment has to be taken in view of the additional return from investment.

(4) Business Objectives

Traditionally, the study of managerial decision making has focussed on a single objective of profit maximisation. This stems from the fact that, in the past, owners of businesses were considered to be simply interested in making profit. But today the development of modern capitalism has led to the separation of ownership and control in modern companies. Managerial class controls company's operations, while ownership of the company is spread among number of shareholders. This has led to the emergence of other possible objectives, apart from the maximum profit, which the managers could pursue. These include maximum of sales revenue, attaining growth targets and achievement of personal goals such as reward, security and status. Thus, managerial economics differs from the traditional economic theory with regard to its assumption of profit maximisation. Though, profit maximisation, within the legal, moral, public and community constraints, may still continue to be one of goals of the firm, yet other considerations may compel it to earn just satisfactory or reasonable profit.

(5) Time Dimension

Managerial decisions and objectives need to be considered within a time framework. Economist normally distinguishes between two broad time periods, namely short run and long run. The short run represents the operating period of the business in which at least one factor of production or input is fixed in supply. In short run, some inputs such as machinery, plant equipment, land buildings etc are fixed whereas some inputs such as raw materials, labour etc are variable and change with the level of output. The level of output can be changed with the help of variable inputs only. Long run represents the planning horizon for the business in which all factors of production may be varied. It is a sufficiently long period which enables a firm to expand or reduce its plant, set up a new plant and new land and buildings, increase or decreases the number of machines and other equipments etc. The managerial economists are concerned with the short run and long run effects of decisions on revenues as well as costs. It should be noted that the objective of profit maximisation in the short run may not be consistent with the long run success of the company. In certain circumstances it may even lead to the downfall of the company in the long run. Thus, an important problem in managerial decision making is to maintain the right balance between the long run and short run considerations. A decision may be made on the basis of short run considerations, but may as time elapses have long run repercussions which make it more or less profitable than it first appeared. Therefore, it is important to give due consideration to the time dimension.

(6) Economic Efficiency and Equity

The success or failure of firms is often affected by the extent to which they are managed efficiently. Economic efficiency is concerned with the use of scarce resources to achieve economic objectives. In competitive markets, the lower the cost per unit of output, without reducing the quality of the product, the higher the economic efficiency of the firm. An alternative way of measuring efficiency is to consider the firm's productivity. The productivity of the firm is the efficiency with which resources are used to produce output. Economic efficiency is not necessarily equated with equity. Equity is concerned with the distribution of resources.

(7)Risk and Uncertainty

Businesses do not exist in the world of perfect information. Outcomes are usually uncertain and managerial decisions inevitably involve an element of risk. Risk occurs in economic decision making where there is an element of chance of injury or loss. Some times the risk can be insured against and can therefore be converted through a known cost to the firm. But, some types of outcome cannot be insured as the chance and cost of occurrence are much more difficult to estimate. Such risks are called 'uncertainty'. Examples of uncertainty in business include a loss through unforeseeable changes in the future demand for the product, the effect of unforeseeable political changes and so on. Most of the business decisions are to be taken under the conditions of uncertainty. Under uncertainty, the consequences of an action are not known immediately for certain. Forward planning has to be done when the future is uncertain.

Economic theory generally assumes that the firm has perfect knowledge of its costs and demand relationships and of its environment. Uncertainty is not allowed to affect the decisions. But uncertainty arises because producers simply cannot foresee the dynamic changes in the economy and hence cost and revenue of their firms with reasonable accuracy. Managerial problems would have been less complex, had everything been certain. Therefore managerial economics is an important aid in taking decisions under conditions of uncertainty.

(8)Externalities

Many times business objectives are not compatible with the interests of the society in general. The annual accounts of the firms may not reflect the so called social costs or social benefits. For example, the expansion of industrial output may increase the firm's profit but damage the environment through pollution. Managers of the firms operating in the private sector are likely to find it difficult to incorporate such externalities into their decision-making. This may be either because they may lose out to competitors or because there is no direct return to the share holders. However, it is becoming increasingly important for managers to pay a greater attention to these issues as public awareness of environment issues increases.

(9)Discounting

In considering the costs and benefits of investment project, it is important to appreciate that both internal and external benefits will accrue over the life of the project should be discounted. The concept of discounting is concerned with the fact that costs and benefits arising in future years are worth less to us than costs and benefits arising today. A rupee received today is more valuable than a rupee that will be received later. This is known as the 'time preference of money'. Almost all managerial decisions relate to the future. Anything that is received later always involves an element of risk. Since future is unknown and incalculable there is lot of risk and uncertainty in future. The mathematical technique for adjusting for the time value of money and computing the present value is called discounting. The importance of discounting is greatest when a decision has to be made between investment projects over different time periods which produce alternative stream of returns. The proper evaluation of these alternatives requires the use of an appropriate discount rate

since an investment decision involves the commitment of resources today in order to achieve annual stream of outputs in the future. The concept of discounting is found most useful in managerial economics in decision-making problems pertaining to investment planning.

(10) Property Rights

Property rights define the ownership of property, the uses to which the property can be put, the right of others over the property and how property can be transferred. Thus, property rights relate to “who owns property, to what uses it can be put, the rights people have over it and how it may be transferred”. The property may be tangible (for example, lands, buildings, stocks, bonds, plants, and machinery) or intangible (for example, intellectual property). Only if the property rights are clearly defined and legally protected can mutually beneficial exchange in markets flourish. Common property right always leads to externalities.

Financial Economics and Managerial Economics

As stated above, managerial economics is the application of economic laws and tools of economics to the business decision making. On the other hand, financial economics is a general term applicable to a vast collection of topics related to finance and economics. Financial economics is a branch of economics studying the interrelationship of financial variables, such as prices, interest rates, shares etc, as opposed to those concerning the real economy. Financial economics concentrates on the influences of real economic variables on the financial one. It studies the valuation to determine the fair value of an asset, financial markets, instruments etc.

Finance is a lubricating mechanism to the economic activity. Finance under the head of capital is becoming a factor of production; finance under the head of money is becoming a measure of value, medium of exchange and store of value. Finance is a scarce input particularly in developing countries. Economics is a science dealing scarce mean and unlimited ends. Finance being scarce, the relation of finance with economics is quite important. It is pointed that, in the classical writings of Adam Smith and others, economics is considered as a handmaid of ethics, but modern economics is a handmaid of finance.

MODULE 2

INVESTMENTS

Meaning and Nature of Investment

Investment is the employment of funds on assets with the aim of achieving additional income or growth in value. Investments have financial and economic meaning. In financial sense, investment is the allocation of monetary resources to assets that are expected to yield some gain or positive return over a given period of time. These assets range from safe investments to risky investments. Investments in this form are also called financial investments.

The nature of investment in the financial sense differs from its use in the economic sense. To the economists, investment means the net addition to the economy's capital stock which consist of goods and services that are used in the production of other goods and services. Therefore, investment refers to the formation of new and productive capital in the form of new construction, new plant and equipments. Inventories and human capital are also included in the economist's definition of investment.

The financial and economic meanings are related to each other because the savings of the individuals flow into capital market as financial investments to be used in economic investment. Investors as suppliers and investors as users of long term funds find a meeting place in the market.

Investment has two attributes, namely *time* and *risk*. Investment involves making of a sacrifice in the present with the hope of deriving future benefits. Investment is 'postponed consumption'. It involves waiting for reward. Investment involves commitment of resources which have been saved or put away from current consumption in the hope that some benefits will accrue in the future. The sacrifice that has to be borne is certain but the return in the future may be uncertain. This attribute of investment indicates the risk factor. Risk refers to the possibility of incurring a loss in the financial transaction. But in the broad sense, investment is considered to involve limited risk and is confined to those avenues where principal is safe.

Importance of Investment

Investments are both important and useful in the context of present day conditions. Some factors that have made investment decisions increasingly important are explained below.

1) Longer life expectancy

Investment decisions have become significant as people retire between the age of 55 and 60. But there is a trend of longer life expectancy. Therefore, the earning from the employment should be calculated in such a manner that a portion should be put away as savings. But savings by themselves do not increase wealth. These must be invested in such a way that the principal and income will be adequate for a greater number of retirement years.

2) Increasing rate of taxation

Taxation is one of the crucial factors in any country which introduces an element of compulsion in a person's savings. In our country there are various forms of investments which help in bringing down the tax level by offering deductions in personal income. Examples are life insurance plans, national saving certificates, post office deposits etc.

3) Income

Another reason why investment decisions have assumed importance is the general increase in employment opportunities in the country. After independence, with the stages of development in the country, a number of new organisations and services were formed. The employment opportunities gave rise to expansion of male and female working force. More income and more avenues of investment have led to the ability and willingness of working people to save and invest their funds.

4) Investment Channels

The growth and development of the country leading to a greater economic activity has led to the introduction of a vast array of investment outlets. Apart from putting aside savings in savings bank where interest is low, investors have the choice of a variety of instruments. Some of the instruments available are corporate stock, provident fund, life insurance, fixed deposits in the corporate sector, unit trust schemes and so on.

Nature of Investment Decisions

An individual invests or postpones current consumption only in response to a rate of return which must be suitably adjusted for inflation and risk. Cash has an opportunity cost and when an individual decides to invest it; he is deprived of the opportunity to earn a return on cash. Also when general price level rises, purchasing power of cash falls. This explains the reason why individuals require a 'real rate of return' on their investments. The ultimate objective of the investor is to derive a variety of investments that meet his preference for risk and expected return. The investor will select the portfolio which will maximise his utility. Within the large body of investors some buy government securities or deposit their money in bank accounts that are adequately secured. Securities present a wide range of risk-free instruments to highly speculative shares and debentures. The investor will have to select those securities that maximise his utility.

Thus, the investor has an optimisation problem. He has to choose the security which will maximise his expected returns subject to certain considerations. The investment decision is an optimisation problem but the objective function varies from investor to investor. Some investors prefer safety of securities. Some others prefer equity shares even when they know that they get exposed to risk of losing their money much more than those investing in government securities.

Investment decisions are based on the important assumption that investors are rational and hence prefer certainty. They are risk averse which implies that they would be unwilling to take risk just for the sake of risk. They would assume risk only if an adequate compensation is forthcoming. The principle of rationality combined with the attitude of risk aversion imparts to investment their basic nature.

The Investment Process

The investment process involves a series of activities leading to the purchase of securities or other investment alternatives. A typical investment decision undergoes a *five step procedure* which, in turn, forms the basis of the investment process. These five steps are

- (1) Investment Policy
- (2) Investment Analysis
- (3) Valuation
- (4) Portfolio Construction
- (5) Portfolio Evaluation

(1) Investment Policy

An investor before proceeding into investment formulates the policy for the systematic functioning. The essential ingredients of the investment policy are (a) investible funds (b) objectives and (c) knowledge.

The entire investment procedure revolves around the availability of investible funds. The funds may be generated through savings or from borrowings. If the funds are borrowed, the investor has to be extra careful in the selection of investment alternatives. On the other hand, objectives are framed on the basis of the required rate of return, need for regularity of income, risk perception and need for liquidity. Finally, the knowledge about the investment alternatives and markets plays a key role in the policy formulation. The investment alternatives range from government security to real estate. The risk and return associated with investment alternatives differ from each other.

(2) Investment analysis

After formulating the investment policy, the next step is to analyse the securities available for investment. (Broadly speaking, securities represent evidence to property right. Securities provide a claim on an asset and any future cash flows the asset may generate. Examples: shares, bonds, debentures and so on.) The securities to be bought have to be scrutinised through the market, industry and company analysis. The investor must take a comparative analysis of the type of industry, kind of security and fixed versus variable securities etc. The primary concern at this stage would be to form beliefs regarding future behaviour of prices and stocks, the expected returns and associated risk. The investor should be aware of the stock market structure and the functions of the brokers. The economic significance and growth potential of industry have to be analysed.

(3) Valuation

The third step involves important consideration of the valuation of investments. In general, investment is taken to be present worth to the owner's future benefits from investments. An appropriate set of weights have to be applied with the use of forecasted benefits to estimate the value of investment assets. Simple discounting models are also can be adopted to value the shares. The valuation helps the investor to determine the return and risk expected from investment.

(4) Portfolio Construction

A portfolio is a combination of securities. Portfolio construction consists of identifying the specific securities in which to invest and determining the proportion of the investor's wealth to be invested in each. A portfolio is constructed in such a manner to meet the investor's goals and objectives. The investor tries to attain maximum return with the minimum risk. Towards, this end, he diversifies his portfolio and allocates among the securities. A diversified portfolio is comparatively less risky than holding a single portfolio.

(5) Portfolio Evaluation

The portfolio has to be managed efficiently. The efficient management calls for evaluation of the portfolio. This process consists of (a) portfolio appraisal and (b) portfolio revision.

The return and risk performance of the security vary from time to time. The variability in return of the securities is measured and compared. The developments in the economy, industry and relevant companies from which the stocks are bought have to be appraised.

Revision depends on the results of the appraisal. The low yielding securities with high risk are replaced with high yielding securities with low risk factor. To keep the return at a particular level necessitates the investor to revise the components of the portfolio periodically.

Investment Alternatives

At present, a wide variety of investment alternatives or avenues are open to the investors to suits their needs and nature. Knowledge about different avenues enables the investors to choose investment intelligently. Two basic broad investment alternatives are

- I. Financial Assets
- II. Physical Assets

Financial securities may be negotiable or non-negotiable. Negotiable securities are financial securities that are transferable. The negotiable securities may yield variable income or fixed income. Securities like equity shares are variable income securities. Bonds, debentures, government securities etc yield fixed income. Non-negotiable financial investments are not transferable. They are known as non-securitised financial investments. Bank deposits, post office deposits, provident funds, national savings certificates are of this category.

Negotiable Securities

1) Equity Shares

Equity shares are commonly referred to as common stock or ordinary shares. Equity shares represent a share in the ownership of the firm. It represents equity capital which is the ownership capital because equity shareholders collectively own the company.

Even though the words 'shares' and 'stocks' are interchangeably used, there is a difference between them. Share-capital of a company is divided into a number of small units of equal value called shares. Stock is the aggregate of a member's fully paid-up shares of equal value merged into one fund. That is, stock is a set of shares put together in a bundle. A share certificate states the number of shares, their par value, the certificate number, distinctive numbers and name of the owner of the certificate. The following are characteristics of equity shares:

a) *Voting Rights*

Equity shares carry with them a special right of voting for the members owning them, right to receive notice of annual general meeting, right to be elected members of executive committee and become a director of company.

b) *Ownership right*

Equity stock holders are also the owners of the firm. Each share holder receives an ownership right equivalent to the stock he holds in the firm. The right is released only if the equity holder so desires by transferring or selling his shares in the stock market.

c) *Par value*

It is the face value of the share. Equity stock may be sold or issued at premium or at discount, but face value will be the denomination. It shows the liability of an investor. In India, equity stocks of the face value of Rs 10 are usually made.

d) *Right shares*

Share holder has a right of receiving additional shares whenever they are issued by the company. Shares are offered to the existing shareholders and only their refusal can other be offered.

If an increase in the investor's confidence leading to rise in prices of shares, the market is known as "*Bull market*". It is a market which anticipates of future price rise and a sign of recovery. On the contrary, if there is pessimism in the market and decline in the share price, it is known as "*Bear market*". In the bear market investors fear of future loss leads to pessimism.

2) Bonds

A bond is a marketable legal contract that promises to pay its investors a stated rate of interest and to repay the principal amount at the maturity date. Date of maturity is also called the date of retirement. As long term debt instruments, bonds represent senior securities in the firm. In India, public sector companies and financial institutions issue bonds. The basic features of bonds given below

a) Repayment of the Principal

Most important feature of the bond is the return of the principal to the lender on a fixed date specified earlier. The value of the bond is called face value or par value. It represents the promise to repay the amount to the bond-holder.

b) Specified Time period

Second feature is the maturity date of the bond. The time specified in the bond is called maturity date or date of repayment of the principal amount. The maturity date of bond varies according to the requirement of each organisation.

c) Call

Call is the privilege to the issuing company to repurchase bonds at a slightly higher price above the par value. For example, if the market rate of interest falls considerably, by calling the bonds back, company saves money.

d) Coupon Rate

Coupon rate is the stipulated rate of interest to be paid on the face value of a bond. It represents fixed annual rupee amount that is paid as long as the debtor is solvent

3) Debenture

Debentures are generally issued by the private sector companies as a long-term promissory note for raising loan capital. The company promises to pay the principal and interest as stipulated. Debenture is given in the form of certificate of indebtedness by the company specifying the date of redemption and interest rate. The rate of interest is fixed at the time of issue itself which is known as coupon rate of interest. Interest is paid as the percentage of the par value of the debenture and may be paid annually, semi annually or quarterly. In India, maturity period of debenture ranges from 5 to 10 years.

4) Government Securities

The securities issued by the central, state and quasi government agencies are known as government securities or “gilt edged” securities. As government guaranteed security is a claim on government, it is a secured financial instrument which guarantees income and capital. The rate of interest on these securities is relatively lower because of their high liquidity and safety.

Promissory notes are the usual form of govt securities. They are purchased by banks and are highly liquid in nature. The promissory notes can be transferred by transfer or endorsement. Govt provides to the investor a half yearly interest which is given only on presentation of the promissory notes at the office of purchase. In India, RBI issues govt securities on behalf of govt of India.

Primary and Secondary Market:

The primary market is that part of the capital markets that deals with the issuance of new securities. Companies, governments or public sector institutions can obtain funding through the sale of a new stock or bond issue. This is typically done through a syndicate^lof securities dealers. The process of selling new issues to investors is called underwriting. In the case of a new stock issue, this sale is an initial public offering (IPO). Dealers earn a commission that is built into the price of the security offering, though it can be found in the prospectus. Primary markets create long term instruments through which corporate entities borrow from capital market.

Features of primary markets are:

- a) This is the market for new long term equity capital. The primary market is the market where the securities are sold for the first time. Therefore it is also called the new issue market (NIM).
- b) In a primary issue, the securities are issued by the company directly to investors.
- c) The company receives the money and issues new security certificates to the investors.
- d) Primary issues are used by companies for the purpose of setting up new business or for expanding or modernizing the existing business.
- e) The primary market performs the crucial function of facilitating capital formation in the economy.

On the other hand, the “secondary market”, also called aftermarket, is the financial market in which previously issued financial instruments such as stock, bonds, are bought and sold. With primary issuances of securities or financial instruments, or the primary market, investors purchase these securities directly from issuers such as corporations issuing shares in an IPO or private placement, or directly from the case of treasuries. After the initial issuance, investors can purchase from other investors in the secondary market. The term "secondary market" is also used to refer to the market for any used goods or assets, or an alternative use for an existing product or asset where the customer base is the second market

5) Money Market Securities

Money market securities have very short-term maturity of less than a year. Common money market instruments are the following.

a) Treasury Bills

A treasury bill is an instrument of short term borrowing by the govt of India. Generally treasury bills are of 91 days, 182 days and 364 days. Since interest rates offered on treasury bills are very low, individuals rarely invest in them.

b) Commercial Papers

Commercial paper is a short-term negotiable instrument with fixed maturity period. It is an unsecured promissory notes issued by company either directly or through banks. The commercial papers are sold at a discount and redeemed at their face value. The discounted value implicates the interest rate.

c) Certificate of Deposit

The certificate of deposit is a marketable receipt of funds deposited in a bank for a fixed period at a specified rate of interest. They are bearer documents and readily negotiable. Interest rate on them is high.

Non Negotiable Securities

1) Bank Deposits

It is the simple investment avenue open for investors. Investors have to open an account and deposit money. Traditionally, the banks offered current account, savings account and fixed deposit account. Current account does not offer any interest rate while interest rate is low for savings account. The fixed account carries high interest rate and money is locked up for a fixed period.

2) Post Office Deposits

The post office offers the facilities of savings bank and recurring deposits. Withdrawal from the savings bank is by cheques and there is no restriction on withdrawals, unlike the bank. The post office recurring deposit scheme covers free life insurance cover after receiving contributions for 24 months on an account denominations of Rs 5, 10, 15 or 20.

3) National Savings Scheme (NSS)

This is a tax savings scheme in the sense that the amount deposited under it are exempted from tax. Individuals and Hindu undivided families are eligible to open NSS account in the designated post office. It has a lock period of 4 years and withdrawal is permitted at any time after 4 years. Compared to other savings instruments, the return offered by the scheme is lower.

4) Life Insurance

Life insurance is a contract between a person and an insurance company for a number of years covering either the life time period or a fixed number of years. It is a contract for a payment of a sum of money to a person assured or to the person entitled to receive the same on the happening of the event insured against. Life insurance eliminates risk. Life insurance is called investment because of the following reasons.

- a. It provides protection against risk of early death.
- b. It can be used as collateral for taking loans from banks

- c. It provides tax advantages
- d. It is a sum of money received at the end of a particular number of years, that is, termination period of the contract.

Therefore, life insurance is called an investment with an element of protection and an element of investment.

Physical or Real Assets

Physical assets are non-financial form of investments in the form of gold, silver, diamonds, real estate, antiques etc. For ages, gold and silver have been considered as a form of investment. They are considered as best hedge against inflation. Gold and silver are important media for investment from the point of view of both capital appreciation and liquidity. Gold to the investor in the recent years has been important mainly because of the rise in prices due to inflation. Gold may be invested in the form of gold coins, gold bars and gold jewellery. Silver may be owned in the form of coins, glasses, bowls, plates, trays or jewellery. The price of silver, although keeps on rising in the same way as gold.

Since the price of diamonds keep on increasing in the same way as the price of gold, they have good investment value. The price of diamonds increases as diamond carat become higher. It is an extremely risky form of investment because, to a large extent, the value of diamond is based on value judgement.

Real estate has historically been useful in a portfolio for both income and capital gains. The real estate market offers a high return to investors. The word real estate means land and buildings. The price of real estate has increased substantially over the years. The main reasons are population growth, tax advantages in real estate, availability of loans, migration of people towards cities etc.

For antiques, demand is more and supply is very rare and this increases its value. Antique may be in the form of paintings, coins, stamps, sculpture, manuscripts or any other objects of olden days. It has been found that the longer the time of holding this investment, the greater the value of this asset.

Qualities or Traits of an entrepreneur

A successful entrepreneur is essentially an enterprising individual who is able to recognise the potential profitable opportunity and who initiates to produce marketable products by combining the various technologies and through organising together the people, finance and material resources. In short, entrepreneur is a person who initiates, establishes, maintains and expands a new initiative. He is basically an innovator, creator and accomplisher. Some of the qualities or traits of a successful entrepreneur are listed below.

- 1) *Need for achievement*: - entrepreneurs should be willing to work hard and to achieve something excellent despite the challenges and threats in the business environment. Entrepreneurs should have drive and energy to excel.
- 2) *Risk-taking*:- entrepreneurs like to take risks which are calculated but not extreme ones. They undertake risks which are difficult to overcome but are not impossible. Risks should be neither too less nor too more.
- 3) *Optimistic*: - the entrepreneurs have the quality of being optimistic and hoping to succeed rather than experiencing failure. This hope to succeed would enable a sense of determination which will boost their confidence in carrying out the task successfully.
- 4) *Goal setting*: - entrepreneurs are goal oriented. They have the ability to set goals for themselves. The goals are challenging but realistic and attainable. Successful entrepreneurs are experts in setting realistic attainable yet challenging goals for themselves.
- 5) *Problem-solving and sense of effectiveness*: - entrepreneurs like to see the problem solved through their involved efforts. They do not like to avoid the problems but like to be effective and instrumental in solving problems rather than avoiding them.
- 6) *Open-minded*: - successful entrepreneurs develop the habit of learning from experience the limitation of achievement. They modify the goals according to the business challenges and threats. This modification is done in order to make it possible to achieve the goal within given environmental conditions.
- 7) *Need for power and influencing*: - entrepreneurs always feel the need to influence people and implement the ideas so that the organisation takes the shape in actuality. Leading others and influencing them to a great extent through effective dealing is of paramount importance to an entrepreneur.
- 8) *Long term involvement*: - unlike the promoters, the entrepreneurs has a long-term commitment and involvement. His goal is at the distant future and strives hard to reach there steadily through planning and execution.

Capital Budgeting

Quite often a business organisation has to face the problem of capital investment decision. Capital investment refers to the investment in projects whose result would be available only after a year. Capital budgeting or capital expenditure management is the process of making investment decisions in capital expenditures. A capital expenditure may be defined as the expenditure the benefit of which are expected to be received over period of time exceeding one year. The main characteristic of a capital expenditure is that the expenditure is incurred at one point of time whereas benefit of the expenditure are realised at different points of time in future. In simple language, capital expenditure is an expenditure incurred for acquiring or improving the fixed assets, the benefit of which are expected to be received over a number of years in future.

Capital budgeting involves the planning and control of capital expenditure. It is the processes of deciding whether or not commit resources to a particular long term project whose benefits are to be realised over a period of time. It is concerned with the planning and control of capital expenditure. Capital budgeting refers to long term planning for proposed capital outlays and their financing. It includes both raising of long term funds as well as their utilisation. Capital budgeting is also called investment decision making, capital expenditure decisions, planning capital expenditure and analysis of capital expenditure.

Charles T Horngren has defined capital budgeting as “capital budgeting is the long term planning for making and financing proposed capital outlays”. According to Philippatos “capital budgeting is concerned with the allocation of firm’s scarce financial resources among available market opportunities”. According to Gilman “capital budgeting refers to the total process of generating, evaluating, selecting and following up on capital expenditure alternatives”. For Milton H Spencer, “capital budgeting involves the planning of expenditure for assets, the return from which will be realised in future time periods”.

The above definitions clearly gives the meaning of capital budgeting as essentially a list of what the management believes to be worthwhile projects for the acquisition of new capital assets together with the estimated cost of each project.

Importance of capital budgeting

Capital budgeting decisions are among the most crucial and critical business decisions. It is indispensable for establishing and running industrial organisation. The need, significance or importance of capital budgeting arises mainly due to the following.

1) Large investments

Capital budgeting involves large investment of funds. But the funds available with the firm are limited and demand for funds far exceeds the resources. Hence, it is very important for a firm to plan and control its limited capital expenditure. In modern times, a lump amount is needed to set up a plant which will have to be raised from the financial market. If the outcome from the investment is not sufficient, then the firm incur losses. Thus, for spending large amount for a project, the management will have to make a proper study of its future profitability.

2) Long term commitments of funds

The capital expenditure involves not only large amounts of funds but also funds for long term. The long term commitment of funds increases the financial risk involved in investment decisions. Different investment proposals have varying degrees of risks and uncertainties. When a huge investment is made, it cannot be transferred and the investment sinks. All these uncertainties can be avoided if a realistic capital budgeting is made.

3) Irreversible nature

The capital expenditure decisions are irreversible in nature. Once the decisions for acquiring a permanent asset is taken, it becomes difficult to dispose of these assets without incurring heavy losses. That is, long term investment once made cannot be reversed easily without significant loss of invested capital.

4) Long term effect on profitability

Capital budgeting decisions have a long term and significant effect on the profitability of a firm. Not only the present earning of the firm are affected by the investment in capital assets but also the future growth and profitability of the firm depends upon the investment decisions taken today. Capital budgeting is necessary whenever long term investment is required to be made, since the firm's survival depends on managerial ability to conceive, analyse and set the most profitable projects for investments, given the objectives of the firm.

5) Difficulties of investment decisions

The long term investment decisions are difficult to be taken because decisions extent to a series of years, uncertainties of future and higher degree of risk. Capital budgeting decisions are quite vital for the reputation of the management. The decisions regarding the choice of capital projects, addition to the stock of capital, replacement of worn out capital, volume and timing of investments are very essential for capital budgeting. Thus capital budgeting is one of the difficult areas of managerial decision making.

6) National importance

Investment decisions, though taken by individual concern, are of national importance. This is because it determines employment, economic activities and economic growth.

Methods of Capital Budgeting

Various methods of evaluating profitability of capital investment proposals are as follows

A. Traditional Methods

1. Pay back method
2. Post pay back profitability method
3. Rate of return method

B. Time Adjusted or Discounted method

4. Net present value method
5. Internal rate of return method
6. Profitability index method

1. Payback Period Method

The payback is also called as “payout” or “payoff” period method and represents the period in which total investment in permanent assets pays back itself. It measures the period of time for the original cost of the project to be recovered from the additional earning of the project itself. That is, payback period is the length of time required for the initial investment to be recouped out of the annual cash flow produced by the investment.

Under this method, various investments are ranked according to the length of their payback period in such a manner that the investment with a shorter payback period is preferred to the one which has a longer payback period. The formula for calculating the payback period is

$$\text{Payback period} = \frac{\text{Cost outlay of the project or original cost of asset}}{\text{annual cash inflows}}$$

Or

$$\text{Payback period} = \frac{\text{Initial Investment}}{\text{Annual cash flow}}$$

Thus, payback period is derived by dividing the initial outlay (cost) of the project by annual cash inflows. For example, is a project coat is Rs 100000 and yields an annual cash inflow of Rs 20000, for eight years, then,

$$\text{Payback period} = \frac{\text{original cost of asset}}{\text{annual cash inflows}} = \frac{100000}{20000} = 5 \text{ years}$$

Payback method indicates only the number of years it will take to recover the initial investment and does not measure the rate of return. If the cash flow is not uniform over the years, we will find out the cumulative cash flow. When cumulative cash flow is equal to the initial investment, we get the payback period. The payback method emphasises the quick cash return flow. This concept is particularly useful where liquidity is an important consideration.

Payback method is extremely simple to apply and easy to understand. The firm can judge the length of time its funds will be tied up and the risks involved in the various projects. The method takes care of the fact that investment decisions are made under conditions of high uncertainty. Payback method is especially useful in industries subject to rapid technological advances, where the plant becomes obsolete before the end of its physical life. Again, in a period of tight money when funds are difficult to get, a quick pay back project may be preferred to one which may yield higher rate of return, yet commit funds for a longer period.

2. Post Payback Profitability Method

One of the serious limitations of payback period methods is that it does not take into account the cash flows earned after payback period. Hence, the true profitability of the project cannot be assessed. Post payback profitability method takes into account the returns available beyond the payback period.

$$\text{Post payback profitability index} = \frac{\text{post payback profit}}{\text{investment}} \times 100$$

3. Rate of Return Method

This method takes into account the earnings expected from the investment over the whole life. It is also known as “accounting rate of return” as only accounting rate of profit (that is, net profit after tax and depreciation) is used. It is also called “Financial statement method” or Return on investment method” or Average Rate of return method. The project with higher rate of return is selected. The return on investment can be selected in several ways. Under the average rate of return method, average profit after tax and depreciation is calculated and then it is divided by the capital outlay or total investment in the project.

$$\text{Average rate of return method} = \frac{\text{average annual profits}}{\text{net investments in the project}} \times 100$$

This method aims at providing us an estimate of the rate of return. Under this method, capital employed and related income is determined by following the principles and practices employed in accounting.

4. Net Present Value Method

The net present value method is one of the discounted cash flow or time adjusted method. This is generally considered as the best method for evaluating capital investment proposals. This method takes into consideration the time value of money and attempts to calculate the return on investments by introducing the factor of ‘time element’. It recognises the fact that a Rupee earned today is worth more than the same Rupee earned tomorrow. In this method, an appropriate rate of interest should be selected as the minimum rate of return and present value of total investment outlay is calculated.

The present value of Rs. 1 can be calculated as $PV = \frac{1}{(1+r)^n}$ where r = rate of discount or interest and n = number of years.

The present value for all cash inflows for a number of years can be found as

$$PV = \frac{A_1}{1+r} + \frac{A_2}{(1+r)^2} + \frac{A_3}{(1+r)^3} + \dots + \frac{A_n}{(1+r)^n}$$

Where A_1, A_2, \dots, A_n are the future cash flows, that is, profit after tax before depreciation.

5. Internal Rate of Return Method

Internal rate of return of capital budgeting takes into account the time value of money. It is also known as “time adjusted rate of return”, “discounted cash flow”, “discounted rate of return” etc.

Under this method, cash flows of a project are discounted at a suitable rate, which equates the net present value so calculated to the amount of investment. Under this method, since discount rate is determined by internally, the method is called as internal rate of return method. Internal rate of return can be defined as that rate of discount at which the present value of cash flows is equal to the present value of cash outflows. That is,

$$C = \frac{A_1}{1+r} + \frac{A_2}{(1+r)^2} + \frac{A_3}{(1+r)^3} + \dots + \frac{A_n}{(1+r)^n}$$

Where C= initial outlay.

This method measures the rate of return which earnings are expected to yield on investments. The discounted rate of return is that rate of interest which, when applied to a series of future cash flows, brings the sum of their present values to the same level as the original investment. The merit of internal rate of return method is (a) it considers the time value of money (b) it considers the cash flows over the entire life of the project and (c) the calculation of the cost of capital is not a precondition for the use of this method.

6. Profitability Index Method

This method is based on time adjusted techniques and also called Desirability factor or benefit cost ratio (B/C). The procedure of deriving the benefit cost ratio criterion is the same as that of net present value. B/C is the relationship between present value of cash inflows and the present value of cash outflows. What is done is to divide the present value of benefit by the present value of costs. The ratio between the two gives us the B/C ratio which indicates benefit per rupee of cost.

$$\text{B/C or Profitability Index} = \frac{\text{Present Value of Cash Inflows}}{\text{Present Value of cash outflows}}$$

Or

$$\text{B/C or Profitability Index} = \frac{\text{Present Value of Cash Inflows}}{\text{Initial cash outlay}}$$

Or

$$\text{B/C or Profitability Index} = \frac{\text{Present Value of Benefit}}{\text{Present Value of Cost}}$$

MODULE 3

ORGANISING FINANCIAL ASSET

Balance Sheet

A balance sheet is prepared by a business concern in order to measure the exact financial position of a business on a particular date. It is a *statement which reflects the assets and liabilities of a business on a given date*. It shows what the business owns and how much it owes.

The balance sheet also known a 'position statement' because it shows the position of assets and liabilities of a business on a particular date. It may be defined as "a statement drawn up at the end of each trading or financial period, setting forth the various assets and liabilities of the concern as at this date". The following are important features of a balance sheet.

- 1) It is a statement which is prepared on a particular date and is true only on that date. It indicates the true only on that date. It indicates the true financial position only on that particular date and not on any other date.
- 2) The assets and liabilities are arranged in a particular order. That is assets are arranged on the right hand side and liabilities and capital on the left hand side of the balance sheet.
- 3) Balance sheet discloses the detailed nature of assets and liabilities. That is, fixed assets, current assets, etc and in the case of liabilities, current liabilities, fixed liabilities etc.
- 4) Balance sheet satisfies the formula $\text{Asset} = \text{liabilities and capital} = \text{asset} - \text{liabilities}$. That is, total of assets is equal to the liabilities and capital.

Classification of Assets

Assets are properties owned by a business concern it include cash, stocks, book-debts, land, and buildings. Assets may be classified into the following types.

a) Fixed assets

These are assets of a permanent nature which are used in the operation of business and are not intended for sale. Examples: land and buildings, machinery, furniture etc.

b) Current assets

Assets which are held for a short period are called current assets. These are assets acquired with the intention of converting them into cash or consuming them during the normal operating cycle of business. The examples of current assets are cash in hand, cash at bank, debtors, bills receivable etc.

Classification of Liabilities

Liabilities denote the amounts which a business owes to others either for money borrowed or for goods and assets purchased on credit or for services rendered. Thus, liabilities are claims of outsiders against the business. They can be divided in to two categories:

(a) Current Liabilities

These are liabilities which become due and payable within a short time (usually one year or less). They arise out of normal trade activities. Examples are bills payable, bank overdraft, outstanding expenses etc.

(b) Long term or fixed Liabilities

Liabilities which are payable after a long period (usually more than one year) are termed as fixed or long term liabilities. Long term loans from financial institutions, debentures etc are examples of long term liabilities.

Arrangement of Assets and Liabilities in the Balance Sheet

The assets and liabilities should be arranged in some specific order in the balance sheet and this system is known as “grouping and marshalling” of assets and liabilities. When items of similar nature are placed in a group, it is known as ‘grouping’. E.g. all creditors are put under the head of sundry creditors. Showing the assets and liabilities in a particular order is known as ‘marshalling’.

There are two methods by which assets and liabilities are arranged in the balance sheet. They are

(a) Order of liquidity

(b) Order of permanence

Arranging the assets in the order of realisability and placing liabilities in the order of urgency of payment is known as liquidity order. In the case of assets, cash in hand, being the most liquid asset shown firstly, while goodwill being the least liquid asset is shown lastly. In the case of liabilities, the most urgent one to be met immediately is shown first and the least urgent to be paid is shown last. A specimen balance sheet in the order of liquidity is given below

Balance sheet as at -----

| Liabilities | Amount | Assets | Amount |
|------------------------------|--------|------------------------|--------|
| <u>Current Liabilities</u> | | <u>Current Asset</u> | |
| Bank overdraft | ----- | Cash in hand | ----- |
| Bills Payable | ----- | Cash at bank | ----- |
| Outstanding expenses | ----- | Sundry debtors | ----- |
| Sundry creditors | ----- | Prepaid expenses | ----- |
| Income received in advance | ----- | Accrued income | ----- |
| <u>Long-term liabilities</u> | | Closing stock | ----- |
| Long-term loans | ----- | <u>Investment</u> | |
| Long-term deposits | ----- | <u>Fixed Asset</u> | |
| <u>Capital</u> | | Loose tools | ----- |
| Opening Balance ----- | | Furniture and fixtures | ----- |
| Add net profit ----- | | Plant and machinery | ----- |
| Or less net loss ----- | | Land and buildings | ----- |
| Or less drawings----- | | Patent and trade marks | ----- |
| | ----- | Goodwill | ----- |
| | | | ----- |

When assets and liabilities are arranged in a reverse order from which is followed in the case of liquidity, it is called order of permanence. So, fixed assets and long term liabilities are shown firstly on the respective side of the balance sheet. This system is generally followed in the case of joint stock enterprises.

Example 1

From the following particulars, prepare a balance sheet as on 31st December 2012.

Capital (January, 2012) = Rs 30,000

Net Profit = 6000

Drawing = 5000

Long term loans = 16,000

Creditors = 3500

Bills payable = 2600

Outstanding expense = 750

Cash in hand = 2400

Cash at bank = 9260

Sundry debtors = 12,240

Plant and machinery = 21,550

Furniture and fixtures = 7210

Closing stock = 1190

Balance sheet as at 31st December 2012

| Liabilities | Amount | Assets | Amount |
|---------------------|---------------|------------------------|---------------|
| Bills Payable | 2600 | Cash in hand | 2400 |
| Sundry Creditors | 3500 | Cash at bank | 9260 |
| Outstanding Expense | 750 | Sundry debtors | 12240 |
| Long term loans | 16000 | Closing stock | 1190 |
| Capital | | Furniture and fixtures | 7210 |
| Opening balance : | | | |
| 30000 | | | |
| Add Net Profit:6000 | | Plant and machinery | 21550 |
| 36000 | | | |
| Less Drawings: 5000 | | | |
| 31000 | | | |
| | 53850 | | 53850 |

Example 2

From the following particulars construct a balance sheet of Mr Mohan as at March 31, 2013

Capital as at April 1 2012 = 7500

Stock of goods, March 31 2013 = 3720

Loss for the year = 1800

Bank overdraft = 1980

Debtors = 4890

Drawings during the year = 330

Loans from Mr Naidu = 3300

Fixtures and fittings = 2220

Creditors =4350

Cash in hand = 75

Machinery = 4095

Balance sheet as on March 31, 2013

| Liabilities | Amount | Assets | Amount |
|----------------------|---------------|-----------------------|---------------|
| Bank Overdraft | 1980 | Cash in hand | 75 |
| Creditors | 4350 | Debtors | 4890 |
| Loans from Mr Naidu | 3300 | Stock of goods | 3720 |
| | | Fixtures and fittings | 2220 |
| Capital | | Machinery | 4095 |
| Opening Balance 7500 | | | |
| Less Net Loss 1800 | 5700 | | |
| Less Drawings 330 | 5370 | | |
| | 15000 | | 15000 |

Time Value of Money

Most of the financial decisions, such as acquisitions of assets or procurement of funds affect firm's cash flows in different time periods. If the firm acquires an asset today, it will require an immediate cash outlay; but the benefit of this asset will be received in future. Thus, while making financial decision, the firm will have to compare the total cash inflows with cash outflows. The logical way is to recognise the time value of money and make appropriate adjustments for time.

The concept of time value of money is that the value of money received today is more than the value of the same amount of money received after a certain period. That is, money received in the future is not as valuable as money received today. The sooner one receives money, the better it is. This phenomenon is referred to as "time preference for money". The reasons for time preference of money are the following.

- a) The future is always uncertain and involves risk.
- b) Generally, people prefer to use their money for satisfying their present needs than deferring them for future.
- c) Money has time value because of the opportunities available to invest money at earlier dates at some interest to enhance future earnings.

Techniques of Time Value of Money

There are two techniques for adjusting the time value of money, namely (1) Compounding or Future Value Approach and (2) Discounting or Present Value Technique.

1) Compounding or Future Value Approach

The future value shows how much a sum of money becomes at some future period. In compound or future value approach the money invested today appreciates because the compound interest is added to the principal.

The future value at the end of period 1 can be calculated by a simple formula

$$V_1 = V_0(1 + i)$$

Where V_1 = future value at the period 1

V_0 = original sum of money (value of money at time 0)

i = rate of interest

For example, the future value of Rs 100 after one year at 10% interest rate will be

$$V_1 = 100\left(1 + \frac{10}{100}\right)$$

$$V_1 = \text{Rs } 110$$

Then the value after two years

$$V_2 = 110\left(1 + \frac{10}{100}\right)$$

$$V_2 = \text{Rs } 121$$

Similarly the value after three years

$$V_3 = 121\left(1 + \frac{10}{100}\right)$$

$$V_3 = \text{Rs } 133.10$$

We can generalise the above formula to find the future value of current sum of money at period 'n' as

$$V_n = V_0(1 + i)^n$$

For example the value of Rs 100 after ten years will be

$$V_{10} = 100\left(1 + \frac{10}{100}\right)^{10}$$

$$V_{10} = 100(1.10)^{10}$$

$$V_{10} = 259.4$$

It can be noted that the second year's interest will be paid on both original principal and the interest earned at the end of the first year. This paying of interest is called "compounding".

2) Discounting or Present Value Technique

Present value is the exact opposite of compound or future value. Present value shows what the value is today of future sum of money. Present value is the current worth of future cash flows. The present value of the money to be received in future date will be less because we have lost the opportunity of investing it at some interest.

Thus, the present value of money to be received in future will always be less. It is for this reason that the present value technique is called discounting. Present value can be calculated by the formula

$$V_0 = \frac{V_n}{1 + i}$$

Where, V_0 = Present Value

V_n = Future Value in the period n

i = Rate of interest

For example, the present value of Rs 1000 to be received to be received after one year at 10% time preference rate (rate of interest), will be

$$V_0 = \frac{1000}{1 + \frac{10}{100}}$$

$$V_0 = \frac{1000}{1.10} = \text{Rs.909}$$

In many instances, we may have to calculate the present value several sum of money, each occurring at different period of time. If series of payments is represented by $R_1, R_2, R_3, \dots, R_n$, the present value of the series of payment will be

$$V_0 = \frac{R_1}{1+i} + \frac{R_2}{(1+i)^2} + \dots + \frac{R_n}{(1+i)^n}$$

$$V_0 = \sum_{t=1}^n \frac{R_t}{(1+i)^t}$$

Where R_t is the payment at period t. We can calculate the present value of a series of payments by finding out present values of such individual payments and then adding these present values.

Example:

Calculate the present value of the following cash flows assuming a discount rate of 10%.

| Year | Cash Flows (in Rupees) |
|------|------------------------|
| 1 | 1100 |
| 2 | 2420 |
| 3 | 6655 |

$$V_0 = \frac{R_1}{1+i} + \frac{R_2}{(1+i)^2} + \frac{R_3}{(1+i)^3}$$

$$V_0 = \frac{1100}{1+0.1} + \frac{2420}{(1+0.1)^2} + \frac{6655}{(1+0.1)^3}$$

$$V_0 = 1000 + 2000 + 5000 = \text{Rs } 8000.$$

Break Even Analysis

Break even analysis reveals the relationship between the volume and cost of production on the one hand and revenue and profits obtained from the sales on the other. It involves the study of revenues and costs of the firm in relation to its volume of sales and specifically the determination of that volume at which the firm's cost and revenues will be equal. According to Martz, Curry and Frank "a break even analysis indicates at what level cost and revenue are in equilibrium". The break even analysis has been proved highly useful to the managers in profit forecasting and planning and also in examining the effect of alternative business decisions.

Break Even Point

In the case of break even analysis, breakeven point is of particular importance. Breakeven point maybe defined at that level of sales at which total revenue and total costs are equal. This is also known as "no-profit no-loss point". It is the specific level of activity or volume of sales where the firm break even, that is, TC equals TR. If the firm produces and sells less than what is suggested by the breakeven point, it would incur losses; while if the firm produces and sells more than the level of breakeven point, it make profits. The main objective of the break even analysis is not simply to spot the break even point, but to develop an understanding of the relationships of cost, price and volume within a company's practical range of operations. The following table illustrates the break even point when the selling price of the commodity is assumed to be constant Rs 4 per unit.

| Output in units | Total Revenue | Total Fixed Cost | Total Variable Cost | Total Cost |
|-----------------|---------------|------------------|---------------------|------------|
| 0 | 0 | 150 | 0 | 150 |
| 50 | 200 | 150 | 150 | 300 |
| 100 | 400 | 150 | 300 | 450 |
| 150 | 600 | 150 | 450 | 600 |
| 200 | 800 | 150 | 600 | 750 |
| 250 | 1000 | 150 | 750 | 900 |
| 300 | 1200 | 150 | 900 | 1050 |

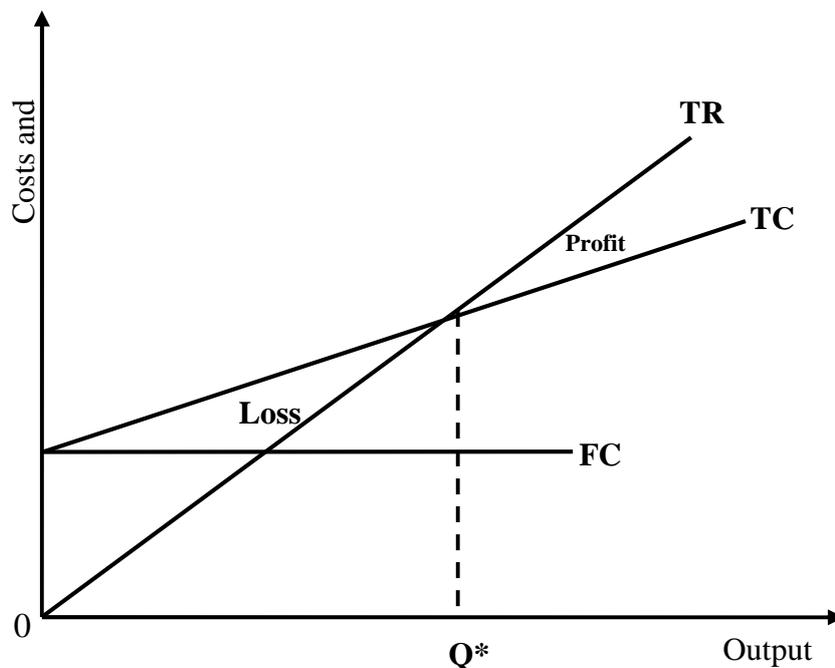


Since the price of the commodity is assumed to be fixed at Rs 4 per unit, as in the case of perfect competition, the total revenue is increasing proportionately to the output. The total fixed cost is kept constant at Rs 150 at all levels of output. The total variable cost is assumed to be increasing by a given amount throughout. From the table it can be seen that when the output is zero

the firm incurs only fixed cost. When the output is 50, the total cost is Rs 300 but the total revenue is Rs 200 only. That is, the firm incurs a loss of Rs 100. At the level of output 150 units, the total revenue is equal to the total cost. At this level, the firm is working at a point where there is no profit or loss. Thus, the level of output 150 defines the firm's break even point.

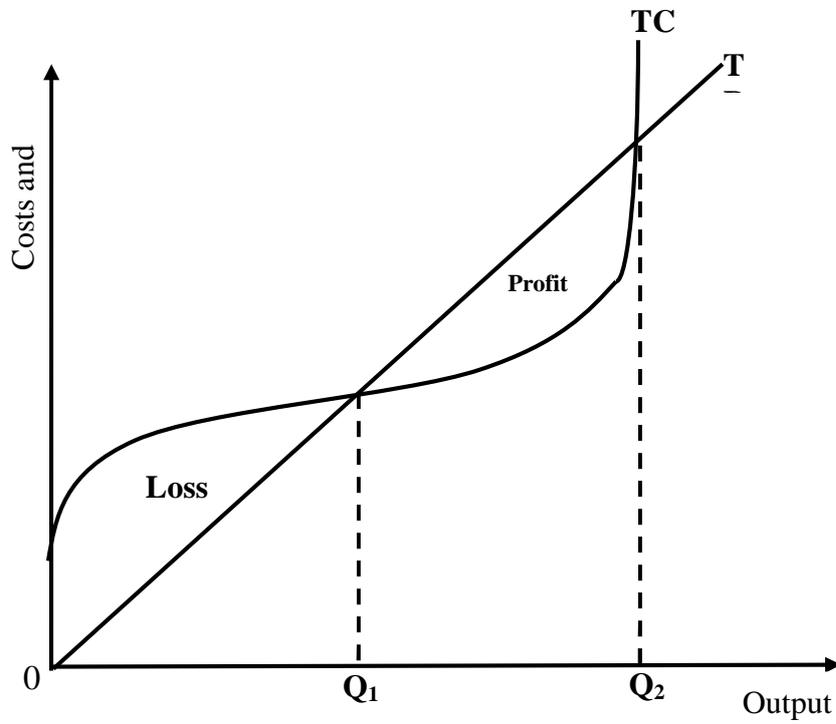
Break Even Chart

We can represent breakeven point with the help of breakeven chart. Breakeven chart is very useful in the breakeven analysis as it helps the management in visualising the profit or loss implications at different level of sales. Break even charts are being used in recent years by the managerial economists, company executives and government agencies in order to find out the break even point. It shows the extent of profit or loss to the firm at different levels of the activity. It is an excellent instrument panel for the guidance and controlling of business for the managers. A typical breakeven chart is shown below.



Total revenue curve (TR) is shown as linear as linear as it is assumed that price is constant, irrespective of the output, as it is the case of perfect competition. Linearity of total cost curve (TC) results from the assumption of constant variable cost. In the figure, Q^* corresponds to the breakeven point.

We can also represent breakeven point with nonlinear cost and revenue function. When AVC changes at different levels of output, the cost function will be nonlinear. The TR is linear when we assume price is constant. This is shown below.



Here there are two breakeven points, namely Q_1 and Q_2 , where TR equals TC. The output corresponding to the breakeven point is $0Q_1$ and $0Q_2$.

MODULE 4

INTRODUCTION TO DEMAND ESTIMATION

The Nature of Demand

In economics, demand refers to the various quantities of a good or service that people will be and able to purchase at various prices during a period of time. It is important to note that a mere desire for a good or service does not constitute demand. Demand implies both the desire to purchase and ability to pay for the good. Unless demand is backed by purchasing power, it does not constitute demand. Further, demand does not refer to the specific quantity that will be purchased at some particular price, but refer to a series of quantities and their associated prices.

Demand Function

Demand for a commodity is determined by several factors. An individual's demand for a commodity depends on the own price of the commodity, his income, prices of related commodities, his tastes and preferences, advertisement expenditure made by the producers of the commodity, expectations etc. Thus, individual's demand for a commodity can be expressed in the following general functional form,

$$Q_x^d = f(P_x, I, P_r, T, A, E) \text{ where,}$$

Q_x^d = Quantity demanded of commodity "x"

P_x = Price of commodity x

I = Income of the individual consumer

P_r = Price of related commodities

T = Tastes and preferences of individual consumer

A = Advertisement expenditure

E = Expectations

The demand function is just a short hand way of saying that quantity demanded , which is recorded in the left hand side depends on the variables that are recorded on the right hand side. For many purposes in economics, it is useful to focus on the relationship between quantity demanded of a good and its own price, while keeping other determining factors constant. Thus, we can write the demand function as

$$Q_x^d = f(P_x)$$

This implies that the quantity demanded of the commodity x is a function of its own price, other determinants remaining constant.

Elasticity of Demand

We have seen that the demand for a commodity is determined by its own price, income of the consumer, prices of related goods etc. Quantity demanded of a good will change as a result of a change in the size of any of these determinants of demand.

Elasticity measures the sensitivity of one variable to another. Specifically, it is a number that tells us the percentage change that will occur in the variable in response to one percent increase in another variable. Therefore, elasticity of demand refers to the sensitiveness or responsiveness of quantity demanded of a good to a change in its own price, income and prices of related goods. Accordingly, there are three kinds of elasticity of demand. They are

1. Price elasticity of demand
2. Income elasticity of demand
3. Cross elasticity of demand

Price elasticity of demand measures the sensitivity of quantity demanded to change in own price of a good. Income elasticity of demand measures the sensitivity of quantity demanded to change in income of the consumer. While cross elasticity of demand analyses the responsiveness of quantity demanded of one good to changes in the price of another good.

Price elasticity of demand

Price elasticity of demand refers to the responsiveness or sensitiveness of quantity demanded of a good to changes in its own price. In order to have a measure of the responsiveness of quantity demanded of a good to change in its price that is independent of units of measurement, Alfred Marshall, defined in terms of percentage or relative change in quantity demanded to price. As such, price elasticity of demand is given by the percentage change quantity demanded of a good divided by the percentage change in its price. The elasticity is usually symbolised by Greek letter eta (η). Thus, we have

$$\eta = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in price}}$$

Percentage change in price

Now denoting ΔQ for change in quantity demanded and ΔP for the change in price, we have the formula for the price elasticity of demand as

$$= \frac{\Delta Q/Q}{\Delta P/P}$$

That is,
$$= \frac{\Delta Q}{Q} \cdot \frac{P}{\Delta P}$$

Or

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

Since, price and quantity demanded are inversely related the coefficient of price elasticity of demand () is a negative number. In order to avoid dealing with negative values, a minus sign is often introduced into the formula of price elasticity of demand. That is

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

Thus, price elasticity of demand is measured by a ratio; the percentage change in quantity demanded divided by the percentage change in the price that brought it about. For normal negatively sloped demand curves, price elasticity will be negative, but two Elasticities are compared by comparing their absolute values. As such, price elasticity of demand is a pure number that is it has no units of measurement attached to it. This allows meaningful comparison between the price elasticity of demand of different commodities.

The above formula is called point elasticity formula of demand because it measures elasticity at a point on the demand curve. The value obtained for is just a number like 2 or 5 or ½ and is referred to as the coefficient of elasticity. Since price elasticity is being measured at a point on the market demand curve we are assuming that all other factors that affect market demand remain fixed.

Degrees of Price Elasticity of Demand

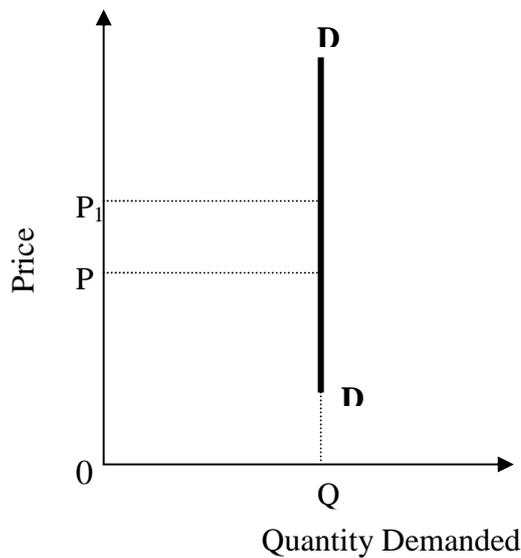
The value of price elasticity of demand ranges from zero to infinity. That is, $0 \leq \leq \infty$. Based on the value of elasticity or degree of responsiveness of quantity demanded, price elasticity of demand is classified into five categories. They are

- 1) Perfectly inelastic demand
- 2) Inelastic demand
- 3) Unitary elastic demand
- 4) Elastic demand
- 5) Perfectly elastic demand

Now let us analyse each of them in detail.

(1) Perfectly inelastic demand

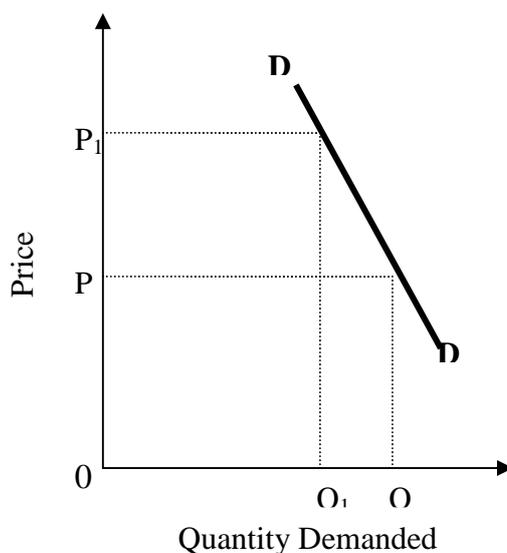
When quantity demanded does not change as a result of change in price, demand is said to be perfectly inelastic. Quantity demanded is unchanged when price changes or demand shows no response to change in price. In other words, same quantity will be bought whatever the price may be. Numerical value of elasticity will be zero (= 0) when there is perfectly or completely inelastic demand. The following figure illustrates the case of perfectly inelastic demand.



A change in price from P to P₁ leaves quantity demanded unchanged at Q units. That is, quantity demanded does not change at all when price changes.

(2) Inelastic Demand

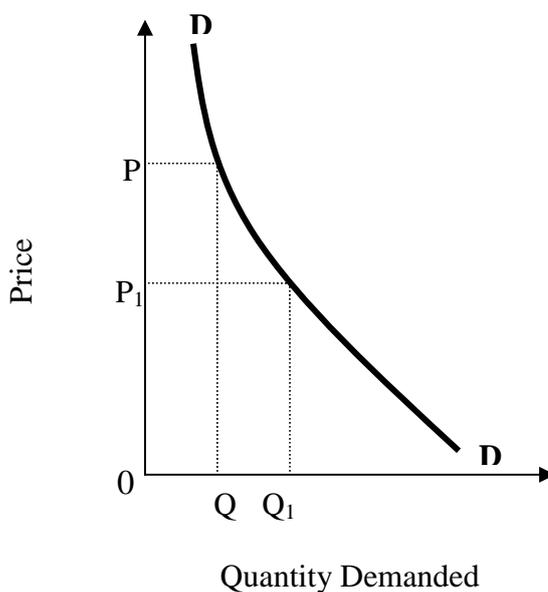
As long as there is some positive response of quantity demanded to change in price, the absolute value of elasticity will exceed zero. The greater the response, the larger the elasticity. However, when percentage change in quantity demanded is less than percentage change in price, demand is said to be inelastic. That is, a certain percentage change in price leads to a smaller percentage in quantity demanded. The coefficient of elasticity will be less than one but greater than zero ($0 < < 1$) when demand is inelastic. This is shown below.



When change in price from OP to OP_1 causes a less than proportionate change in quantity demanded. That is, quantity demanded changes by a smaller percentage than the change in price.

(3) Unitary Elastic Demand

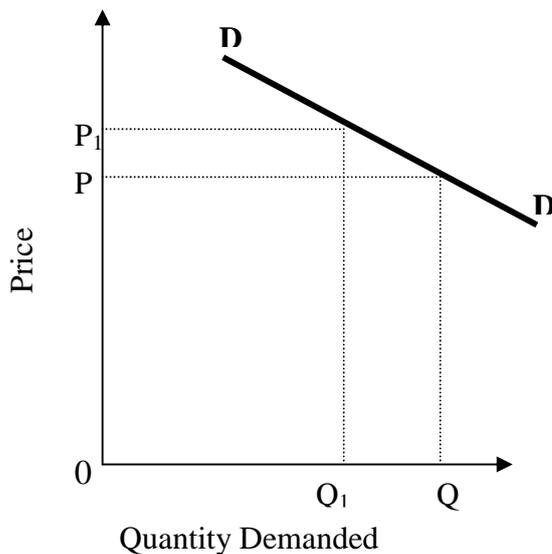
If a certain percentage change in price leads to an equal percentage change in quantity demanded, then demand is said to have unitary elasticity. Unitary elasticity is the boundary between elastic and inelastic demand. The coefficient of elasticity will be equal to one when demand is unitary elastic ($=1$). The demand curve having unitary elasticity over its whole range is shown below



OP and OQ are the initial price and quantity. A fall in price from OP to OP_1 causes an equal proportional change in quantity demanded from OQ to OQ_1 .

(4) Elastic Demand

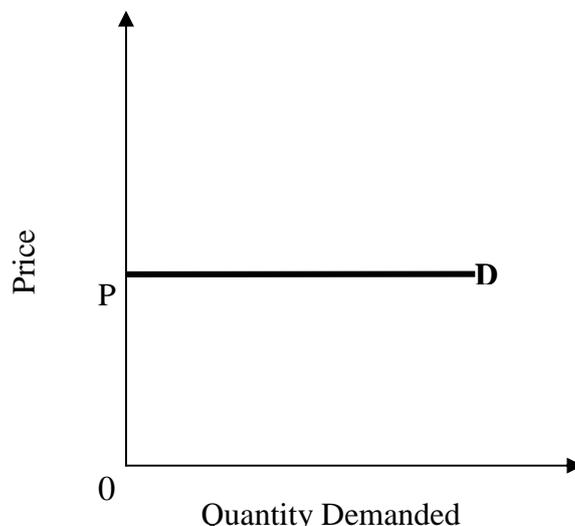
When the percentage change in quantity demanded exceeds the percentage change in price, the demand is said to be elastic. That is, a certain percentage change in price leads to a greater percentage change in quantity demanded. The value of coefficient of elasticity will be greater than one but less than infinity when demand is elastic ($1 < < \infty$). This is shown below.



An increase in price from OP to OP_1 causes a more than proportionate increase in quantity demanded as shown by the change in quantity demanded from OQ to OQ_1 . Thus, a small rise in price brings in more than proportionate fall in quantity demanded.

(5) Perfectly Elastic demand

If a small change in price leads to an infinitely large change in quantity demanded, we can say that demand is perfectly elastic. When demand is perfectly elastic, small price reduction will raise demand to infinity. At the same time, a slightest rise in price causes demand to fall to zero. At the going price, consumers will buy an infinite amount (if available). Above this price, they will buy nothing. The coefficient of elasticity will be infinity when demand will be infinite when demand is perfectly elastic ($= \infty$). The graph for perfectly elastic demand is shown below.



When it is perfectly elastic, demand curve is a horizontal straight line. In his case an infinitely large amount can be sold at the going price OP. A small price increase from OP decreases quantity demanded from an infinitely large amount to zero (hyper sensitive demand).

The following table summarises the terminology of price elasticity of demand

| Term | Numerical Measure of elasticity | Shape of the demand curve | Verbal description |
|---------------------|---|--|---|
| Perfectly inelastic | Zero | Vertical (parallel to Y-axis that measures price) | Quantity demanded does not change an price changes |
| Inelastic | Greater than zero but less than one | Steeper | Quantity demanded changes by a smaller percentage than does price |
| Unitary elastic | One | Rectangular hyperbola | Quantity demanded changes exactly the same percentage as does price |
| Elastic | Greater than one but less than infinity | Flatter | Quantity demanded changes by a larger percentage than does price |
| Perfectly elastic | Infinity | Horizontal (parallel to X-axis that measures quantity) | Buyers are prepared to buy all they can at some price and none at all at higher prices. |

Income Elasticity of Demand

The responsiveness or sensitiveness of quantity demanded of a commodity to changes in income of the consumer is termed as income elasticity of demand. It is the proportionate or percentage change in quantity demanded resulting from proportionate change in income. Thus we have

$$y = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in income}}$$

Percentage change in income

Now denoting ΔQ for small change in quantity demanded and ΔY for the small change in income we may symbolically write the formula for the income elasticity of demand as

$$e_y = \frac{\Delta Q/Q}{\Delta Y/Y}$$

That is, $e_y = \frac{\Delta Q}{Q} \cdot \frac{Y}{\Delta Y}$

Or

$$e_y = \frac{\Delta Q}{Q} \cdot \frac{Y}{\Delta Y}$$

For the most commodities, increase in income leads to increase in quantity demanded. Therefore, income elasticity is positive. If the resulting percentage change in quantity demanded is larger than the percentage change in income, income elasticity will exceed unity ($e_y > 1$). Then the commodity's demand is said to be income elastic. If the percentage change in quantity demanded is smaller than the percentage change in income, income elasticity will be less than unity ($e_y < 1$). Then the commodity's demand is said to be income inelastic. If the percentage changes in income and quantity demanded are equal, income elasticity will be unity ($e_y = 1$). The commodity's demand is said to have unitary income elasticity of demand. Unitary income elasticity represents a useful dividing line.

There is also a relationship between income elasticity for a commodity and proportion of income spent on it. If the proportion of income spent on the commodity increases as income increases, then the income elasticity of demand for the commodity is greater than unity ($e_y > 1$). If the proportion of income spent on the commodity decreases as income rises, then the income elasticity of demand for the commodity is less than unity ($e_y < 1$). At the same time, if the proportion of income spent on the commodity remains the same as income rises, then the income elasticity of demand for the commodity is equal to unity ($e_y = 1$).

If the commodity is normal, a rise in income causes more of it to be consumed. Other things being equal, this means a rightward shift in the commodity's demand curve. Thus, income elasticity will be positive for normal commodities. In the case of such commodities, an increase in income leads to an increase in quantity demanded. On the other hand, if the commodity is inferior, a rise in income causes less of it to be demanded. This implies a leftward shift in the commodity's demand curve. Thus income elasticity for inferior commodities will be negative. In the case of inferior commodities increase in income will lead to fall in quantity demanded. The boundary case between normal and inferior commodities occurs when a rise in income leaves quantity demanded unchanged so that income elasticity is zero. Zero income elasticity implies that quantity demanded of the

commodity is quite unresponsive to changes in income. Zero income elasticity is significant because it represents a dividing line between positive income elasticity on one side and negative income elasticity on the other.

A normal commodity can be further classified as necessities and luxury using income elasticity. A commodity is considered as necessity if the income elasticity is less than unity. That is, in the case of necessities, the proportion of income spend on it falls as income rises. A commodity is considered to be luxury if its income elasticity is greater than unity. The proportion of consumer's income spend on luxuries rises as his income increases.

It should be said that, sometimes, the same commodity can be regarded as a luxury by some individuals or at some income levels and as a necessity or even as inferior commodity by other individuals or at other income levels. The terminology of income elasticity is summarised in the following table.

| Type of Goods | Numerical Measure of Income elasticity | Verbal description |
|--------------------|--|--|
| (1) Inferior Goods | Negative | Quantity demanded decreases as income increases |
| (2) Normal goods | Positive | Quantity demanded increases as income increases |
| 2.1 Necessity | Less than one | Quantity demanded increases less than proportion to increase in income Quantity demanded increases more than proportion to increase in income |
| 2.2 Luxury | Greater than one | |

Cross Elasticity of Demand

The responsiveness of quantity demanded of one commodity to changes in the prices of other commodities is often of considerable interest. The responsiveness or sensitiveness of quantity demanded of one commodity to the changes in the price of another commodity is called cross elasticity of demand. Thus, cross elasticity of demand can be defined as percentage or proportionate change in quantity demanded of commodity X resulting from a proportionate change in the price of commodity Y. the cross elasticity of commodity X with respect to the price of Y (e_{XY}) can be presented as

$\epsilon_{XY} = \frac{\text{Percentage change in quantity demanded of X}}{\text{Percentage change in price of Y}}$

Percentage change in price of Y

We may symbolically write the formula for the cross elasticity of demand as

$$\epsilon_{XY} = \frac{\Delta Q_X / Q_X}{\Delta P_Y / P_Y}$$

That is, $\epsilon_{XY} = \frac{\Delta Q_X}{Q_X} \cdot \frac{P_Y}{\Delta P_Y}$

Or

$$\epsilon_{XY} = \frac{\Delta Q_X}{Q_X} \cdot \frac{P_Y}{\Delta P_Y}$$

Where ΔQ_X is the change in quantity demanded of X, ΔP_Y is the change in price of Y, P_Y is the original price of Y and Q_X is the original quantity of X. The coefficient of cross elasticity can vary from minus infinity to plus infinity. Substitute goods have positive cross elasticity and complementary goods have negative cross elasticity.

If ϵ_{XY} is positive, the commodities X and Y are said to be substitutes. X and Y are substitutes if more of X is purchased when price of Y goes up. That is, an increase in P_Y leads to an increase in Q_X as X is substituted for Y in consumption. For example, consumers usually purchase more coffee when price of tea rises. Thus coffee and tea are substitutes or competing goods. In response to the rise in the price of one good, the demand for the other good rises.

On the other hand, if ϵ_{XY} is negative, X and Y are said to be complementary goods. When X and Y are complementary goods, less of X will be purchased when the price of Y goes up. That is, an increase in P_Y leads to a reduction in Q_X (and Q_Y). For example consumers usually purchase fewer scooters when the price of petrol goes up. Thus scooter and petrol are complements. Other examples of commodities that are complements are bread and butter, tea and sugar and so on. In the case of complements, a rise in the price of one good brings about a decrease in demand for the other, as they are consumed together.

If ϵ_{XY} is zero, X and Y are independent commodities. A change in price of Y has no effect on the quantity demanded of X. This may be the case with cars and pencils, telephones and chewing gum and so on.

It should be noted that the value of ϵ_{XY} is not equal to the value of ϵ_{YX} since the responsiveness of Q_X to the change in P_Y need not be equal to the responsiveness of Q_Y to the change in P_X . For example, a change in the price of tea is likely to have a greater effect on the

quantity of sugar (a complement of tea) demanded than the other way around, since tea is more important of the two in terms of total expenditure.

The concept of cross elasticity of demand is very significant in economic theory. The classification of commodities into substitutes and complementary is in terms of cross elasticity of demand. Again, a high positive cross elasticity of demand is often used to define an industry since it indicates that various commodities are similar. Besides we can also classify different market structures on the basis of cross elasticity of demand.

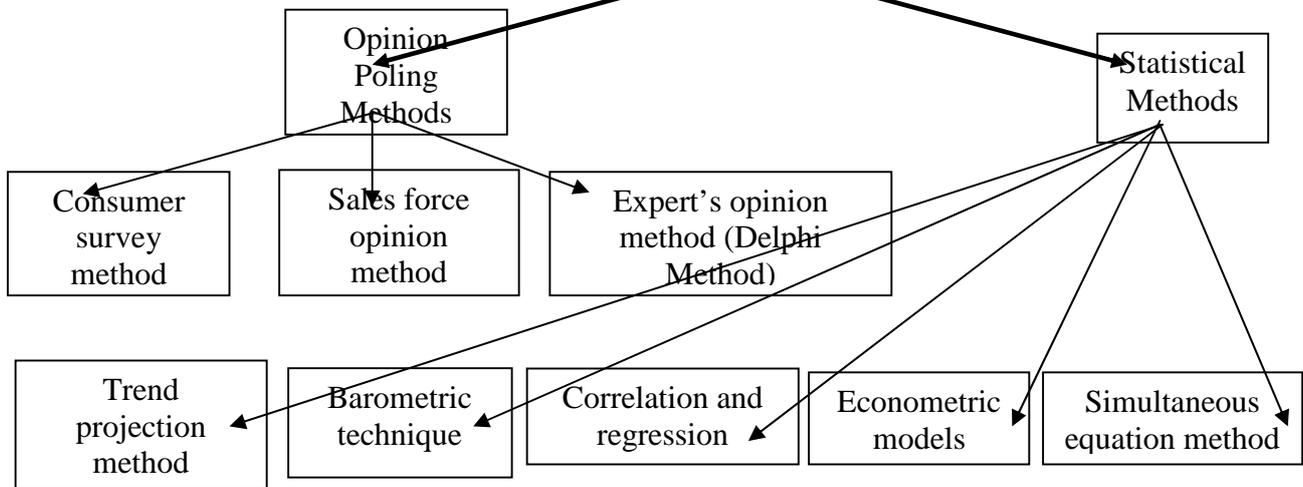
Following table summarises terminology of cross elasticity of demand

| Type of goods | Numerical measure of cross elasticity | Verbal description |
|----------------------|--|--|
| Substitutes | Positive | Quantity demanded of a good increases if the price of substitutes increases |
| Complementary | Negative | Quantity demanded of a good decreases if the price of complements increases |
| Independent | Zero | Quantity demanded of a good remains unchanged to change in the price of other good |

Demand Forecasting

Forecasting is a prediction of a future situation. Demand forecasting predicts about the future trends in sales. That is, it refers to the process of finding values for the demand for the firm's product in future time periods. Forecasting is done both for the long run as well as short run. In a short run forecast seasonal patterns are of prime importance. Such a forecast helps in preparing suitable sales policy and proper scheduling of output in order to avoid over stocking or costly delays in meeting the orders. Long run forecasts are helpful in proper capital planning. It is usually used for new unit planning, expansion of existing units, planning for long run financial requirements and manpower requirements.

Methods of Demand Forecasting



1. Consumer's survey method

In this method, consumers are contacted personally to disclose their future purchase plans. This may be attempted with the help of either a complete survey of all consumers (complete enumeration), or by selecting a few consuming unit out of the relevant population (sample survey). In the case of commodity under consideration is an intermediate product, then the industries using it as an end product is surveyed.

2. Sales force opinion method

In this method, the men who are closest to the market, namely sales man, are questioned and their responses or reactions are aggregated. The advantage of this method is that it is cheap and easy in the sense that it does not involve any elaborate statistical measurement. It is based the first hand knowledge of the salesmen. This method is quite useful for forecasting demand for new products and is therefore known as 'reaction survey method'.

3. Expert opinion method and Delphi Method

Obtaining views from a group of specialists outside the firm has the possible advantages of speed and cheapness. This method is best suited in situations where intractable changes are occurring, e.g. forecasting future technological states. It is possible that in the cases where basic data are lacking experts give divergent views, but even then it is possible for the manager to adapt his thinking on the basis of these views.

Delphi method of forecasting demand is essentially based on opinion of experts. This method was originally developed at Rand Corporation in 1950 by Olaf Helmer, Dalkey and Gordon at the beginning of Cold War, to forecast the impact of technology on warfare.(Delphi is the ancient Greek Temple where people come and pray for information about their future). Under this method, demand is forecasted on the basis of opinion of experts. Delphi is a way of getting the opinion of experts without their face to face interaction. By this method, a panel of carefully selected

independent experts answers questionnaires in two or more rounds. At the end of which, an anonymous summary of each expert's opinion is provided. This offers scope for revision of previous replies and group eventually converges towards the correct answer.

4. Trend Projection technique

These methods are based on the past sales pattern. They are used when available sales data relate to different time periods. Therefore, it is also known as 'time series analysis' and is based on the assumption that future events are continuation of the past and therefore, historical data can be used to predict the future. Popularity of these methods rests on the fact that these are simple inexpensive and quick methods of forecasting. These methods yield reasonably accurate results so long as the trend of the data has a persistent tendency to move in the same direction.

5. Barometric technique

Barometric technique is based on the assumption that relationship can exist among various economic time series. Barometric forecasting relates to forecasting cyclical swings in the level of economic activity or business cycles by using the index of economic indicators. A rise in leading economic indicators is used to forecast an increase or decrease in the general business activity. Barometric forecasting is based on the idea that future can be predicted from certain events occurring in the present.

6. Correlation and regression methods

This is perhaps the most popular method of forecasting. Unlike the time series, the correlation and regression methods do not limit itself to 'time' as the independent variable. It recognizes the fact that sales depends upon the factors other than time. These factors may be own advertising and competitors advertising strategies, competitors price, weather conditions etc. Set of variables influencing sales is identified through correlation and the regression equation is then specified to study changes in sales.

7. Econometric models

Forecasting is increasingly being performed with econometric models. They seek to explain the relationship being forecast and are essential for devising optimal policies. Econometric forecasting models frequently incorporate other forecasting techniques ranging from single equation models for forecasting a firm's sale to multiple equation models of the entire economy.

8. Simultaneous equation Method

This method is also known as the complete system approach. It involves simultaneous considerations of all variables, as it is believed that every variable influences the other variable in an economic decision environment. In this method, the set of equations are made equal to the number of dependent variables or endogenous variables. That is, a system of n equations and with n unknowns.

Production Function

Production is the process by which inputs are transformed into output. The output is thus the function of input. The functional relationship between physical input and physical output is known as production function. Algebraically, production function having only two inputs can be stated as

$$Q=f(K, L)$$

Where, Q represents output, K represents quantity of capital and L represents quantity of labour. Production function includes all technically efficient methods of production. That is, it specifies maximum quantity of output that can be produced from given input.

In economics, we are interested in two types of production function, namely, short run production function and long run production function. In short run, quantities of some inputs such as capital and land are kept constant and quantity of one input is varied. Short run is such that the firm does not have sufficient time to change all its inputs. This kind of input-output relations forms the subject matter of law of variable proportion or law of diminishing returns. On the other hand, in long run all input are varied. There is no fixed factor in the long run. This forms the subject matter of law of return to scale.

Total, Marginal and Average Product

Total Product (TP) refers to the total output of the firm per period of time. Total product of a variable factor is the amount of total output produced by given amount of the factor, other factor held constant.

Marginal Product (MP) is the change in total product resulting from an additional unit of the variable factor. That is, MP is the addition to total product by the employment of an additional unit. We can express marginal product of labour as $MP_L = \frac{Q}{L}$, where Q is the total product or output and L is the quantity of labour.

Average Product (AP) is the total product divided by the number of units of the variable factor. That is average product of a factor is total output produced per unit of the factor employed. We can express average product of labour as $AP_L = \frac{Q}{L}$.

Law of Diminishing Returns (Law of Variable Proportions)

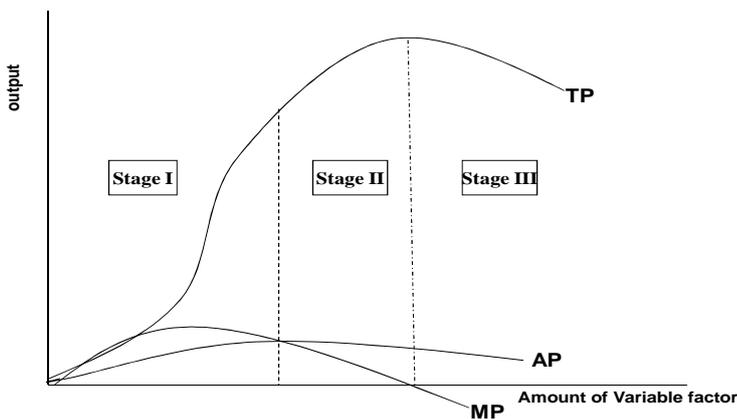
The Law of variable proportion occupies an important place in economic theory. The law examines the production function with one factor variable, keeping the quantities of other factors fixed. Thus the law of variable proportion shows the production function in the short run.

The law of variable proportion states that when more and more units of a variable factor is employed, keeping other factors constant, a point is reached beyond which the marginal product, then the average product and finally total product will diminish. Thus, the law refers to the behaviour of output as quantity of one factor is increased. It states that MP and AP will eventually

decline. In the words of Benham “as the proportion of one factor in a combination of factors is increased, after a point, first the marginal then the average product of that factor will diminish”.

The law of variable proportion is illustrated in the following table and figure. Assume that there is fixed amount of land with which more variable factor namely labour is used to produce rice. The behaviour of MP, AP and TP is summarised in the table.

| Units of labour | TP | AP | MP |
|-----------------|----|-----|----|
| 1 | 8 | 8 | 8 |
| 2 | 20 | 10 | 12 |
| 3 | 36 | 12 | 16 |
| 4 | 48 | 12 | 12 |
| 5 | 55 | 11 | 7 |
| 6 | 60 | 10 | 5 |
| 7 | 60 | 8.6 | 0 |
| 8 | 56 | 7 | -4 |



Three Stages of the Law of Variable Proportion

The behaviour of output when the varying quantity of one factor is combined with a fixed quantity of the other can be divided in three distinct stages. These three stages are called stage of increasing returns, stage of diminishing returns and stage of negative returns.

Stage 1: Increasing Returns

In this stage TP increases first at an increasing rate then at a diminishing rate. The MP also rises first then falls but MP is positive. Stage 1 ends when AP curve reaches its highest point. It is called stage of increasing returns because AP increases throughout the stage. MP is falling but $MP > AP$ in the first stage

Stage 2: Diminishing Returns

In this stage, total product continues to increase at a diminishing rate until it reaches its maximum point where the second stage ends. In this stage, both MP and AP of the variable factor are diminishing but are positive. MP becomes zero when TP reaches its maximum. The stage is called stage of diminishing returns as both MP and AP continuously fall during this stage

Stage 3: Negative Returns

In stage 3, TP declines and TP curve slopes downwards. As a result MP of the variable factor is negative. In this stage variable factor is too much relative to fixed factor. The stage is called stage of negative returns since MP is negative during this stage.

A rational producer will never choose to produce in the stage 1 and 3. If he is producing in stage 1, he is not utilizing his resources fully and there are opportunities of increasing production. Similarly, in stage 3 marginal product is negative. Thus stage 1 and 3 represents non economic regions in production function. A rational producer always seeks to produce in stage 2 where both MP and AP are diminishing. Thus stage 2 represents the range of rational production decisions.

Law of Returns to Scale

The law of returns to scale describes the relationship between output and scale of input in the long run when all inputs are increased in the same proportion. According to Roger Miller, the law of returns to scale refers to the relationship between changes in output and proportionate changes in all factors of production.

If all inputs are increased in unchanged proportions, the effect on output shows three stages, namely, stage of increasing returns to scale, constant returns to scale and diminishing returns to scale. If the increase in output is more than proportional to increase in all inputs, it is called increasing returns to scale. Returns to scale increase because of the indivisibility of factors of production. Indivisibility means that machines, management, labour and finance etc cannot be available in small sizes; they are available only in certain minimum sizes. When business units expands, the returns to scale increase because the indivisible factors are employed to their maximum capacity. Increasing returns to scale also results from specialization and division of labour.

Returns to scale become constant as the increase in total product is in exact proportion to the increase in inputs. That is, if the proportional increase in all inputs is equal to the proportional

increase in output, the returns to scale are constant. The reason is that internal and external economies are counterbalanced by internal and external diseconomies. Returns increase in the same proportions so that there are constant returns to scale over a large output.

Constant returns to scale is a passing phase, because ultimately returns to scale start diminishing. Returns to scale diminish because increase in output is less than proportionate to the increase in inputs. Indivisible factors may become inefficient and less productive. Business may become unmanageable and produce problems of supervision and coordination. Large management creates difficulties of control and rigidities. To these internal diseconomies are added external diseconomies. This arises from higher factor prices or from diminishing productivities of the factors. All these factors tend to raise the costs and the expansion of the firm leads to diminishing returns to scale.

Cost Function

Production is the result of combined efforts of factors of production. The suppliers of factors of production should be paid a reward for participating in production. Cost of production is the sum total remuneration paid to owners of factors of production. Thus, cost may be defined as payments for the factors of production that the firm uses to produce goods and services. The value of inputs required in the production of a commodity determines its cost of output.

The cost function expresses a functional relationship between total cost and factors that determines it. Important factors that determine total cost of production of a firm are output, the level of technology, the prices of factors and fixed factors. But such comprehensive cost function requires a multidimensional analysis. Thus, usually cost function is shown as the functional relationship between cost and output. It is expressed as $C = f(Q)$, which means that the total cost (C) is a function (f) of output (Q), assuming all other determinants held constant.

Cost Estimation

Four broad approaches exist for the measurement of cost function, namely

- 1) Accounting method
- 2) Statistical or econometric method
- 3) Survivorship method
- 4) Engineering method

1. Accounting Method

This method is used by the cost accountants. In this method, the data are classified into various cost categories. Observations of costs are then taken at the extreme and the various intermediate levels of output. By plotting the output levels and the corresponding costs on a graph and joining them by a line cost functions are estimated.

2. Statistical or Econometric Method

This method used statistical methods on economic data to find the nature of cost-output relationship. The economic data may relate to the past records of the firm (time series data) or to the different firms in the same business at a point of time (cross section data).

3. Survivorship Method

This method is based on the rationale that overtime, competition tends to eliminate firms of inefficient size and the only firms with efficient size will survive as these firms will have lower average cost. In this technique, firms in the industry are classified into size groups. Growth of firms' overtime in each size groups is examined. The size group whose share in the industry grows the most during the specified time period is considered as the most efficient size group.

4. Engineering Methods

In this approach, cost functions are estimated with the help of physical relationships, such as weight of supplies and materials used in the process, rated capacity of an equipment etc. Emphasis is placed primarily on the physical relationships of the production and these are then converted into money terms.

Cartel

A cartel is an explicit agreement among independent firm on subjects like prices, output, market sharing etc. The desire of the firms to have large joint profits gives urge to form cartels. Cartel may be the arrangements between the producers or sellers for the purpose of regulating competition in the production and selling of the commodity. Example OPEC.

There are mainly two types of cartels

- 1) Centralized cartels
- 2) Market sharing cartel

A centralized or perfect cartel is an arrangement where the firms in an industry reach an agreement which maximize joint profits. So cartel can act as a monopolist. Since the firms in the cartel are assumed to produce homogeneous product, the market demand for the product is the cartel's demand. It is also assumed that the cartel management knows the demand at each possible price and also the marginal costs of all its firms.

In the market sharing cartel, the firms in the industry produce homogeneous product and agree upon the share each firm is going to have. Each firm sells at the same price but sells within a given region. Such a system can function only if firms have identical costs.

Price leadership

Perfect collusion is often not possible in practice. Thus there are other forms of imperfect collusion and the most important is the price leadership. According to Burns “ if changes are usually or always inaugurated by the same firm and usually or always followed with similar price changes by other sellers, price competition may be said to involve price leadership”.

Price leadership is an informal position given to or attained by a firm in an oligopoly market to lead other firms in pricing. There are three kinds of price leadership

- 1) Price leadership by the dominant firm
- 2) Price leadership by the low cost firm
- 3) Barometric price leadership

1. Price leadership by the dominant firm

This model rests on the assumption that the oligopoly industry is composed of one large firm together many small firms. The large firm is the dominant firm which, if it desires, can drive out its rivals by price war. To avoid any such possibility, a tacit collusion may be arrived at between the dominant firm and the small firms. This collusion may occur in the form of price leadership by the dominant firm in the sense that it fixes the price and the small firms act as price-takers.

2. Price leadership by the low cost firm

This is also known as price leadership by the efficient firm. Here, firms with relatively higher costs fear that the competition with the efficient firm will results in price war which may results in the erosion of their market share and may eliminate them in the long-run if the price fell lower than the average cost. Then the price and output decision are taken by the low cost or most efficient firm in the industry.

3. Barometric price leadership

Barometric price leadership gets its name from the fact that one firm act as a ‘barometer’, reflecting changing market conditions or costs of production that require a change in price. The barometric firm is an experienced firm which possesses a better knowledge of the prevailing market conditions and has the ability to predict the market conditions more precisely than any of its competitors. Such a firm initiates price changes which are generally followed by other competitors.

Price discrimination

Sometimes, a monopoly firm might charge different prices to different groups of buyers. This pricing technique is called price discrimination. The price discrimination exists when the same product is sold at different prices to different buyers. The product is basically same, but it may have

slight differences. Thus, price discrimination is the practice of charging different prices to different buyers for similar goods.

There are three conditions that must be satisfied before price discrimination is to be expected. Firstly, the seller of the product must possess some degree of monopoly power. Secondly, the seller must be able to separate buyers into two or more groups or markets and prevent resale of the product among the groups. Thirdly, the price elasticity of demand must differ among the groups of buyers or sub markets. The first two conditions are necessary conditions which must be fulfilled for the implementation of price discrimination. The third condition is necessary condition to make price discrimination profitable.

Prof. Pigou has distinguished between three forms of price discrimination, namely

1. First degree price discrimination
2. Second degree price discrimination
3. Third degree price discrimination

First degree price discrimination is the limiting case in which the firm charges a different price to each of its customers. It charges each customer the maximum price the customer is willing to pay for each unit bought. It is take it or leave it price discrimination. Thus, 'perfect' first degree price discrimination involves maximum possible exploitation of each customer in the interest of seller's profit

In the second degree price discrimination, the monopoly firm discriminate its customers according to quantities consumed. It works by charging different prices for different quantities of the same commodity or service .It is a situation of the firm charges customers different prices according to how much they purchase. Thus, the second degree price discrimination is the practice of charging different prices per unit of the different quantities of the same good or service.

Third degree price discrimination is the practice of dividing customers into two or more groups and charging different prices to each group. Seller divides his customers into two more independent submarkets or groups and the price charged in each submarket depend upon the output sold in that market and demand conditions of that market. Third degree price discrimination is the most common.

Economies of Scale

By the scale of enterprise or size of plant meant the amount of investment in relatively fixed factors of production. Costs of production are generally lower in larger plants than in smaller ones. This is because of a number of economies of large scale production. An economy of scale exists when larger output is associated with lower output. That is economies of scale or economies of large scale production are associated when firm expands their size. Alfred Marshall has classified the economies of scale into two types, namely, Internal economies and External economies.

Internal Economies

Internal economies are internal to a firm when it expands its size or increases its output. They are economies which are available to a particular firm and give it an advantage over other firms engaged in the industry. From the managerial point of view, internal economies are very important as they can be affected by managerial decisions of an individual firm to change its size or scale or otherwise. The following are important types of internal economies of scale

- a) Labour economies: as the firm expands, it achieves labour economies with increased division of labour and specialisation. This leads to greater productive efficiency and reduction in per unit cost in a large firm
- b) Technical economies: technical economies are associated with all types of machines and equipments used by a large firm. They arise from use of better machines and techniques of production which increase output and reduce per unit cost of production.
- c) Managerial economies: when size of the firm increases, the efficiency of management increases because there can be greater specialisation in managerial staff. In a large firm, experts can be appointed to look after various sections or divisions of business. This leads to functional specialisation which increases the productive efficiency of the firm.
- d) Marketing economies: a large firm can secure economies in its purchases and sales. It can purchase its requirements in bulk and thereby get better terms. It can appoint expert buyers and expert salesmen.
- e) Risk spreading economies: a large firm is in a better position than a small firm in spreading risk. It can spread risk through diversification of its product and diversification of market.
- f) Financial economies: a large firm can offer better security and therefore, in a better position to secure easier credit facilities both from its suppliers and its bankers.

External Economies

External economies are external to a firm which are available to it when the output of whole industry expands. External economies are those which are available to all firms in the industry. The external economies occur when an industry is heavily concentrated in a particular area. When this concentration happens, special facilities are attracted to this area. Examples, schools, better transportation facilities, availability of skilled labour etc.

Pricing Practices and Strategies

In economic theory, it is assumed that firms are aiming at maximisation of profit and determines their selling price by equating marginal revenue with marginal cost. But in the real world, firms have a multiple of objectives and profit maximisation is one of the objectives. Managers may seek only satisfactory profit for owners while mainly pursuing goals like achievement of targeted market share or target rate of return. When firms have objectives other than profit maximisation, the marginal pricing principles will not be employed. The main pricing practices and strategies are classified into four categories as shown below.

| <i>Cost oriented pricing</i> | <i>Competition oriented pricing</i> | <i>Pricing based on other economic considerations</i> | <i>Other pricing strategies</i> |
|------------------------------|-------------------------------------|---|---------------------------------|
| 1. Cost plus pricing | 1. Going rate pricing | 1. Administered pricing | 1. Stay-out pricing |
| 2. Marginal cost pricing | 2. Loss leaders | 2. Dual pricing | 2. Price lining |
| 3. Target pricing | 3. Trade association pricing | 3. Price discrimination | 3. Psychological pricing |
| 4. Programme pricing | 4. Customary pricing | | 4. Limit pricing |
| | 5. Price leadership | | 5. Skimming pricing |
| | 6. Cyclical pricing | | 6. Penetration Pricing |
| | 7. Imitative pricing | | |

Cost plus pricing

Cost plus or full cost pricing is the most popular method of pricing in practice because it is simple and assures profitable business. It is scientific and eliminates subjectivity. In this method, the price is determined by adding a fixed mark-up to the cost of acquiring or producing the product. The firms calculate the variable cost of the product and add to it the allocated fixed cost and the mark-up. The mark-up should guarantee the seller a 'fair profit', also called net profit margin (NPM). Thus the desired price is $P = AVC + AFC + NPM$.

Marginal Cost Pricing

Marginal cost pricing implies that the price of the product is based on the incremental cost of production. Unlike the full cost pricing which is based on average cost, the marginal cost pricing is based on variable cost only. Thus, full cost pricing is a long period phenomenon, while the marginal cost pricing is a short period phenomenon. In this case, there is a guarantee that the firm does not shut down, but since it does not cover the fixed cost, it does not guarantee that firms operate at breakeven point.

Target Pricing

It is a refined version of cost plus pricing. When due to some reasons, the firms has to revise its prices, it needs to ensure that the prices so revised would allow it to maintain either (a) fixed percentage mark up over cost or (b) profit as a fixed percentage of total sales or (c) fixed return on existing investment. Rate of return price changes as cost changes. Similarly, if the demand condition or competition for the product undergoes a change the mark up will change, thus leading to price change.

Programme Pricing

In programme pricing, the price is related to the supply price. In order to cover own cost and profit margin, a markup is put over the supply price. This supply price may be the wholesale price or that of goods at the godown etc. Such a pricing policy is quite popular in wholesale and retail trade.

Going rate Pricing

The going rate pricing is opposite to full cost pricing. In the case of latter the emphasis is on cost of production, while in the case the former it is the market situation. The firm examines the general pricing structure in the industry and fixes the price of its own product accordingly. In the situations where there are problems in measuring costs, this pricing method proves to be logical and rational to adopt. It is quite useful when oligopolistic price leadership situation prevail.

Loss leaders

This approach is widely used in retailing business. It is a policy which aims at increasing profit. Sometimes, the firms which manufacture or sell multiple products, charge relatively low price on some popular products with the hope that the customers, who come for the product, will also buy some other products produced and sold by the firm. Such a product is the firm's loss leader. Loss leader does not imply that this product is necessarily sold at loss. But it only means the actual price charged is lower than what could have been charged.

Trade Association Pricing

To avoid uncertainties of pricing decisions and the downward pressure on prices, firms frequently come to implied agreements to maintain prices at similar agreement, since express agreements are generally illegal.

Customary Pricing

In the case of some commodities the prices get fixed because they have prevailed over a long period of time. For example, the price of a cup of tea or coffee in the market is customary fixed. It is only when cost change significantly that the customary prices change. If a new firm enters into the market with a lower cost than the existing firms, still may sell at the customary price.

Price leadership

If there are one or many big firms in the industry whose cost of production is low and they dominate the industry, small firms will not like to enter into price war with these big firms. Rather they may follow the price fixed by the leader. Small firms may change the price only when there is general change in the cost of production and the price leader has recognized and adjusted his price on that basis.

Cyclical Pricing

When pricing by the firm is based on an assessment of general economic environment, it is known as cyclical pricing. In a condition of depression, the firm has to reduce price to continue in the market and in a condition of boom the firm will benefit by rising prices. The firm has to make these adjustments in prices despite the fact that his cost of production may have remain unchanged.

Imitative Pricing

This approach often used in the retail business of non-oligopoly situations. Many time firms considered useful to imitate the price set by other firms. It makes decision making easy as the firm does not have undertake the demand and cost analysis.

Administered Prices

These are those prices which are statutorily fixed by government, taking into account the cost and stipulated profit per unit. The purpose is to control prices of essential commodities and inputs as well as to provide them at economic prices to weaker sections of consumers and producers. The public distribution system, whereby fair price shops sell essential goods to public is based on administered prices.

Dual Pricing

A market, where a commodity is covered simultaneously under the administered price as well as market price, is said to have dual prices. Here, part of the output of the firm is subject to administered price, while the rest of its output is sold in the free market. It is only with respect to the latter that the market forces operate to arrive at a price level.

Price discrimination

As analyzed in the previous section, price discrimination means charging different prices from different customers or for different units of the same product. Price discrimination is possible when the monopolist sells in different markets in such a way that it is not possible to transfer any units of the commodity from the cheap market to the dearer market. But price discrimination is possible only when markets are imperfect.

Stay-out Pricing

When firm is not certain about the price at which it will be able to sell its product, it starts with a very high price. If at this price quotation it is not able to sell, it lowers the price of the product. It will keep on lowering the price till it is able to sell the targeted amount of the product.

Price Lining

Here price of the one product is the total range of the product is fixed. Price of the rest of the commodities is automatically determined by the relationship between the commodity whose price has been fixed and the rest of the commodities in the range. Example: shoes, shirts.

Psychological Pricing

Here a firm fixes a price of its product in a manner which gives the impression of being low. For example, if the price of the product is fixed at Rs. 89.90 rather than Rs 90, it may have the psychological impact on consumers that price is in 80s rather in 90s. This may have some impact on sales.

Limit Pricing

If firm try to establish a price that reduces or eliminates the threat of entry of new firms in to the industry, it is called limit pricing. Thus, limit pricing is entry preventing price. For limit price to be effective some sort of collusion is necessary among existing firms.

Skimming Pricing

This is a short period device for pricing. It occurs when the firm charges a high price in initial stages for a new product in pioneering stage. When demand is either unknown or more elastic at this stage, market is divided into segments n the basis of different degree of elasticity of demand of different consumers. The demand for new products is likely to be less price elastic in the early stages. That is, initial high price helps to 'skim the cream' of the market which is relatively insensitive to price.

Penetration Price

Penetration price is known as charging lowest price for the new product. This is aimed to quick in sales, capture market share, utilise full capacity and economies of scale in productive process and keep the competitors away from the market. Penetration price can be adopted when there is high price elasticity of demand, substantial cost saving due to enhanced production process and eminent threat of potential competition so that big share of the market must be captured quickly.

Suggested Readings

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