UNIT – I

INTRODUCTION

Managerial Economics deals with the use of economic concepts and principles for business decision making. It was also known as “Business Economics”.

The economic theories deals with the number of concepts and principals relating to many business policies like pricing, profit, demand, cost, production, business cycle etc. which supported by allied disciplines like statistics, mathematics etc.

The application of various Economic Theories in solving the business the problems is a subject matter of managerial economics.

MEANING, AND DEFINITION OF MANAGERIAL ECONOMICS

Definitions of Managerial Economics are hereunder :—

1. “Managerial Economics is economics applied in decision making. It is a special branch of economics bridging the gap between abstract theory and managerial practice."

   — Baynes Mote and. Pant.

2. “Business Economics (Managerial Economics) is the integration of economic theory with business practice for the purpose of facilitating decision making and forward planning by management.”

—Spencer and Seegelman.

3. Managerial Economics is essentially applied economics in the field of business management. It is the economics of business or managerial decisions. It pertains to all economic aspects of managerial decision making.

The above definitions very clearly bring out the nature of Managerial Economics. Managerial Economics lies on the border line between economics and business management and serves as a bridge between the two disciplines.

CHARACTERISTICS OF MANAGERIAL ECONOMICS

An analysis of the above definitions clearly brings out the following characteristics of Managerial Economics,

1. **Micro Economics:-**Micro-economics is the study of particular individual households, firms or industries. It studies the behaviour patterns and principles involved in organizing and operating individual business firms or industries. Only the problems of an individual firm are

studied in it.

2. **Economics of Firm :-** Managerial economics largely uses that body of economic concept and principles which is known as 'Theory of the Firm, or economics of the firm.

3. **Use of Macro Economic analysis:-** Managerial economics also uses macro economics to analyse and understand the general business environment in which the business must operate. The important macro factor that affect the firm are trends in national income and expenditure, business cycle, economic policy of the government, general price trends, trends in foreign trade and anti monopoly measures.

4. **Managerial Economics is a pragmatic:-** It is concerned with practical problems and results. It has nothing to do with abstract economic theory which has no practical application to solve the problems faced by business firms. It considers the particular environment of decision-making and not general one.

5. **Managerial economics is Normative:-** The nature of managerial economics is perspective and not descriptive. It deals with future planning, policy-making, decision-making and how to make full use of economic principles in all these. It involves value judgements.

6. It is bridge between traditional economics and business management. It makes an attempt to integrate theory with actual business practice.

Significance of economic analysis in business decisions

The most important function of management of a business firms is decision making and future planning. The most important characteristic conditions wherein the management works and takes decisions are based on uncertainty. Use of economic analyses in decision making and forward planning helps the management in reducing uncertainty in a number of ways. Thus managerial economics is the use of economic analysis helps the management in a number of ways to take appropriate decisions. Economic analysis help the management in following ways.

1. Reconciling traditional theoretical concepts of economics in relation to the actual business behaviour and conditions.

2. Helps in estimating economic relationship through the concepts of elasticity's.

3. Helpful in understanding the general and particular business environment.

4. Use of economic qualities in decision-making and advance planning.

5. Prediction of profit, demand, production cost, price, capital and other relevant

economic quantities.

ASPECTS OF APPLICATION

The application of economics to business management or the integration of economic theory with business have put it has the following aspects :

1. Reconciling theoretical concepts of economics in relation to the actual business behaviour and conditions. Analytical techniques of economic theory builds models by which we arrive at certain assumptions and conclusions are reached thereon in relation to certain firms.

There is need to reconcile the theoretical principles based on simplified assumptions with actual business practice and develop or reformulate the economic theory, if necessary.

For example, it is assumed in economic theory that a firm always acts to maximise profits and on that basis the theory suggests how much the firm will produce and at what price it would sell. But in actual practice firms do not always aim at maximising profits and theory of firm fails to explain this behaviour of the firms.

Moreover certain terms such as profits and costs are not used in business at they are used in economics. In managerial economics, an attempt is made to reconcile the accounting concepts with the economic concepts so that financial data may be used more effectively.

2. Estimating Economic Relationship. Measurement of various types of elasticities of demand like price elasticity, income elasticity, cross elasticity, substitution elasticity, etc., are provided by economics. The estimates of these economic relationships can be used for purpose of business forecasts.

3. Predicting Economic Quantities. Most of the business decisions are taken in an environment of uncertainty. Economic analysis makes possible the forecasting of economic quantities like profit, demand, production costs, price, capital and other relevant quantities. The task of taking business decisions and formulating onward plans becomes simpler and less risky due to prediction of economic quantities.

4. Basis of Business Policies. Business policies and plans for the future can be formulated on the basis of economic quantities.

5. Helpful in Understanding the External Forces constituting the Environment. The business management has to see the relevance and affect of external forces such as business cycle, trends in national income and expenditure, government policies relating to taxation, licensing and price control etc., and adjust his business policies the bearing in mind the full impact of these external forces. Economic theories are applied to know the impact of these

external forces on business.

NATURE OF MANAGERIAL ECONOMICS

Thus, we can say that:

1. Managerial Economics is both a Science and Art:- As science, it establishes cause and effect relationship by collecting, classifying and analysing the facts on the basis of certain principles. For example, it coordinates production and distribution by analysing internal and external factors concerning the firm. Such analysis is based on certain principles of economics, accounting and statistics. Managerial economics is positive science because it answers the questions what are present business conditions and problems and what changes in business condition are expected in times to come. It is also normative science because it tells what goals a firm should pursue and what business policies and programmes it should adopt to achieve these objectives.

Managerial economics is also an art. Art offers the mode of doing a particular thing. Managerial economics applies economic theory and other disciplines to analyse the business problems faced by an organisation. In the process of decision-making management chooses a course of action out of alternative course of actions by applying managerial economics.

Thus, managerial economics is a science as well as an art. It is an applied branch of economics and concerned with decision-making. It uses both mirco and macro economic analysis.

2. It is an applied branch of economics:- Various economic principles and theories are applied towards solving the economic problems. For example, demand analysis, cost analysis, profit analysis are used in solving business problems.

3. It is more concerned with decision making to make the best under a given situation.

4. All decisions relating to subjects covered by Managerial Economics are concerned with the improvement in efficiency of the business firm e.g. how to reduce costs or maximize profits.

5. By nature, the task of decision making is more of micro character because in Managerial economics, decisions are taken only in respect of the economic problems of a particular firm. It is also important in this regard that micro decisions are taken under macro economic conditions e.g. by considering the conditions prevalent in the country.

Scope of Managerial Economics

The principles relating to following topics constitute the scope or subject matter of managerial economics :

1. Demand analysis and forecasting.
2. Cost and production analysis.
3. Pricing decisions, policies and practice.
4. Profit management,
5. Capital management.
6. Analysis of business environment.
7. Allied disciplines.

1. Demand Analysis. A business firm is an economic organisation which is engaged in transforming productive resources into goods that are to be sold in the market. A major part of managerial decision-making depends on accurate estimates of demand. A forecast of future sales serves as a guide to management for preparing production schedules and employing resources. It will help management to maintain or strengthen its market position and profit base. Demand analysis also identifies a number of other factors influencing the demand for a product. Demand analysis and forecasting occupies a strategic place in Managerial Economics.

2. Cost Analysis, Cost estimates are most useful for management decisions. The different factors that cause variations in cost estimates should be given due consideration for planning purposes. There is the element of uncertainly of cost as other factors influencing cost are either uncontrollable or not always known. If one is able to measure cost it is very important for more sound profit planning, cost control and often for sound pricing practices.

3. Pricing Practices and Policies. As price gives income to the firm, it constitutes as the most important field of Managerial Economics. The success of a business firm depends very much on the correctness of the price decisions taken by it. The various aspects that are dealt under it cover the price determination in various market forms, pricing policies, pricing method, differential pricing, productive pricing and price forecasting.

4. Profit Management. The main object of a business firm is to earn the maximum profit. There is always an element of uncertainty about profits because of variation in costs and revenues. If knowledge about the future were perfect, profit analysis would have been very easy task. But in this world of uncertainty expectations are not always realised. Hence profit planning and its measurement constitute the most difficult area of Managerial

Economics Under profit management we study nature and management of profit, profit policies and techniques of profit planning like Break Even Analysis.

5. Capital Management. The problems relating to firm's capital investments are perhaps the most complex and troublesome. Capital management implies planning and control of capital expenditure because it involves a large sum and moreover the problems in disposing the capital assets of are so complex that they require considerable time and labour. The main topics dealt with under capital management are cost of capital, rate of return and selection of projects.

6. Analysis of Business Environment The environmental factors influence the working and performance of a business undertaking. Therefore, the managers will have to consider the environmental factors in the process of decision-making. The management must be fully aware of economic environment, particularly those economic factors which constitute the business climate. The main factors that affect the business climate are general trend in national income and consumption expenditure, general price trends, trading relations with other countries, trends in world market, economic and business policies of the government, industrial relations etc.

Certain macro-economic theories such as income and employment theory, monetary theory etc. help in analyzing business climate. Analysis of monetary policy, fiscal policy, industrial policy, foreign trade policy and other direct controls also help in forecasting business climate. Therefore, macro-economic theory and government policies are also included in the scope of managerial economics.

7. Allied Disciplines. The concepts that help the management in taking business decision are quantitative in nature. Therefore, mathematical tools are widely used in determining relationships between economic variables. The linear programming techniques, which is mathematical, is used by firms to maximize or minimize their objective function. Similarly statistical and accounting principles are used in taking business decision. Therefore, mathematical tools, statistical technique and accounting principles that are used in analyzing business problems also come under the scope of Managerial Economics.

Thus, the scope of Managerial Economics is wide and varied.

DEMAND ANALYSIS

Meaning of Demand Analysis.

Ordinarily, by demand is meant the desire or want for something. In economics, however demand means much more than that the economics meaning of demand refers the effective demand i.e. the amount of buyers are willing to purchase at a given price and over a given period of time. From managerial economics point of view, thus, the demand may be looked upon as follows:-

Demand is the desire or want backed up by money. Demand means effective desire or want for a commodity, which is backed up by the ability (i.e. money or purchasing power) and willingness to pay for it.

The demand does not mean simply the desire or even need for a commodity obviously, a buyer's wish for the product without possessing money to buy it or unwillingness to pay a given price for it will not constitute a demand for it for example a begger's wish for a car will not constitute its potential demand, as he has no ability to pay for it.

In short :

Demand = Desire + Ability to pay + Willingness to spend

DETERMINANTS OF DEMAND

The main determinants of demand are the following:

1. Price of the Product. The price of commodity or services directly affects its demand. The fall in the price of a commodity leads to rise in its demand and rise in price leads to fall in its demand. Price is the only determinant of demand in the short run.

2. Price of Related Goods. Two or more goods can be complementary or substitutes of each other. The demand for a commodity is also affected by changes in price of its complementary or substitute good. If two goods are substitute for each other then the increase in price of one will result in increased demand for the other and vice-versa. E.g. Pepsi and Cocacola are substitute of each other. The rise in the price of Cocacola increases demand for Pepsi and vice-versa.

Complementary goods are those which, are jointly demanded to satisfy a particular demand. There is opposite relationship between price of one complementary commodity and the amount demand of the other complementary commodity. If price of one complimentary rises, the demand for the other complementary falls. E.g. A fall in the price of Car will lead to increase in the demand for petrol.

3. Level of Income. Income is an important determinant of demand for a commodity,

ordinarily, with an increase in income, demand for goods increase. There is a direct relationship between income and quantity demanded. Rich consumers usually demand more and more goods than the poor customers. Demand for luxury and expensive goods is related to the income.

4. Taste, Habits and preferences of Consumer. The demand for many goods also depends on consumer's taste, habit and preferences. Demand for goods changes with change in fashion, habits, customs, traditions and general life-style of the society. Demand for several products like ice-cream, chocolates etc. depends on taste and demand tea, cigarettes, tobacco is a matter of habits.

5. Future trend of Prices. If it is expected that in future the price of a commodity will go up the demand for the commodity in the present also will go up. If the prices are expected to fall then the demand would fall.

6. Changes in Population. Generally the demand for a commodity increases with increase in size of population, other things being equal, it is not merely the change in the size of population but the changes in the composition of population also affect the demand for certain commodities. In a country of increasing population like India where hundreds of childrens are born daily in big cities there will naturally be demand for toys, baby food and alike.

7. State of Business. If the country is passing through prosperity and boom conditions, there will be a marked increase in demand. When the country is passing through recession and depression then level of demand would go down.

8. Distribution of Income and Wealth. If the distribution of income is more equal then the demand for all normal goods will be more. If the income is so unevenly distributed that majority of population is poor then the demand for inferior and necessaries' will be larger.

9. Availability of Consumer Credit. If the credit facilities are available sufficiently to consumers for the purchase of high priced durable goods such as car, colour TV, scooters and alike, then their demand will increase.

10. Different Uses. When the price of a commodity is high, it will be used only in its more important use. As the price of the commodity falls it will be used even in less important uses. Thus, the demand increases will fall in price and vice-versa. Example of gram or electricity can be citied.

11. Change in the number of Buyers. With the fall in the price of a commodity the

number of its purchasers increase and vice-versa. Therefore, demand increases with fall in price and decreases with fall in price and decreases with rise in price.

12. Advertisement and Salesmanship. In the modern market, advertisement greatly influence the demand for a commodity. Infact, the demand for many products like to toothpaste, Cosmetics etc. is greatly affected by advertisement. The best salesmanship is the one who does not merely sell what buyers want but who makes the buyers buy what he sells.

13. Inventions and Innovations. introduction of new goods or substitutes as a result of inventions and innovations in a dynamic modern economy tends to adversely affect the demand for the existing products.

14. Climate and weather conditions. demand for certain products is determined by climatic and weather conditions for example, in summers there is a great demand for cold drinks, fans, air conditioners etc.

15. Fashions. the demand for many products is affected by changing fashions. For example demand for jeans is based on current fashions.

16. Customs. demand for certain goods is determined by social customs, festivals etc., for example, during the Dipawali days there is a great demand for sweets & during Christmas cake are more in demand.

LAW OF DEMAND

The law of demand describes the general tendency of consumers behavior in demanding a commodity in relation to the changes in its price. The Law of demand expresses the relationship between price and quantity demanded of a commodity. According to the law of demand the demand of a commodity extends with fall in its price and contracts with rise in the price, other things being constant. 'Other things being constant' means that the other determinates of demand except price remain unchanged. it explains the inverse relationship between price and quantity demanded.

Statement of law of demand:- "Ceteris paribus, the higher the price of a commodity, the smaller is the quantity demanded and lower the price, larger the quantity demanded".

Chief Characteristics of the Law of Demand

The following are the chief characteristics of the Law of Demand.

1. Inverse Relationship. The relationship between price and the demand of a particular commodity is inverse i.e., the demand of a commodity will fall with the increase in the price of the commodity or it will increase with the fall in-the price.

2. Price an Independent Variable and Demand a Dependent Variable. In the Law of Demand, price is regarded as an independent variable that affects the demand inversely. Thus, it is the effect of price on demand that is to be examined and not the effect of demand on price.

3. It is a Qualitative Statement. The Law of Demand simply explains the direction of change in the demand with the increase or decrease in the price of a commodity. It does not explain the quantum of change. The law is thus, a qualitative statement? and not a quantitative statement.

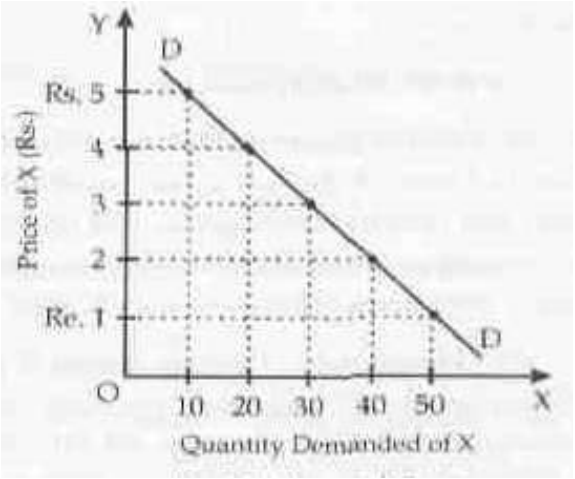
4. Other thing remains the same. The Law of Demand applies only when other things remain the same. In other words, there should be no change in factors influencing demand except price.

The law of demand can be illustrated with the help of a demand schedule. The demand schedules shows that with the fall in the price of the commodity its demand is increasing.

A market demand schedule

Price of Commodity 'X' (in Rs.)	Quantity Demanded of 'X' (in kgs.)
5	10
4	20
3	30
2	40
1	50

From the above example we can say that with a fall in price at each stage demand tends to rise. There is an inverse relationship between price and the quantity demanded.



ASSUMPTIONS OF THE LAW OF DEMAND:

The Law of Demand is based on the following assumptions :

(1) **No change in taste, habits, preferences :** It is assumed that there is no change in the taste, habits, preferences of a rational consumer. Thus, consumers' choice of product must remain the same.

(2) **No change in the income level:** If the consumer's income rises, he will demand more though the prices of commodities rise. In such a situation, the law will not hold good.

(3) **No change in population :** The law is based on the assumption that there should be no change in population, size, sex ratio, age composition, etc.

(4) **No change in prices of related goods :** The law assumes that the prices of close substitutes and the complementary products should remain constant.

(5) **No expectation of future change in the price:** If the consumers expect high rise in the price in future, they demand more though current price is high. In such condition, the Law of Demand cannot be verified.

(6) **No change in taxation :** It is assumed that the structure of direct and indirect taxes remain constant. Thus, the disposable income of a consumer should remain the same.

(7) **No introduction of new product:** It is assumed that there is no introduction of a new product in the market. Thus, the consumer's taste, habits and preferences remain constant.

(8) **No change in technology :** The law assumes that the present technology of production remains constant.

(9) **No change in weather conditions :** Climatic and weather conditions may bring sudden change in demand, though there is no change in the price. Therefore, it is assumed that weather conditions remain constant.

EXCEPTIONS TO THE LAW OF DEMAND

Followings are the exceptions of the law of demand :

1. Articles of Distinction/prestigious goods: The articles of distinction such as diamonds, gems, costly carpets, etc. are in more demand when their prices are high. The reason is that rich people measure the desirability of these articles in terms of their prices alone and consider these goods as honour possession. Therefore, rich people demand more of articles of distinction when their prices are high.

2. Giffen Goods. Price effect is the composite effect of 'income effect' and 'substitution effect. Giffen goods (most inferior goods) are those inferior goods for which 'income effect' of change in price is negative and is greater than the substitution effect. Therefore, the demand of Giffen goods increases with rise in price and decreases with fall in their price.

3. Ignorance of buyers about Quality. Many a times, buyers due inertia or out of sheer ignorance consider the price of the commodity as index of its quality. Due to this ignorance, a lower-price commodity may be considered inferior. Therefore, purchasers buy lesser quantity of the commodity at its lower price. But when the price of commodity is more, buyers consider it to be superior and thus buy more of it than before.

4. Future changes in Prices. Purchaser also act as speculators. When the price has increased and is expected to rise further, buyers tend to purchase more quantities of the commodity out of the apprehension of rise in price in future. Likewise when prices are expected to fall further, a reduced price may not induce the buyers to purchase more of the commodity.

5. Necessities of Life. We cannot reduce the consumption of necessaries of life and conventional necessaries even if their prices have increased sharply.

6.Change in quality: people are to demand more even at a higher price provided quality is good.

7. Fashionable goods. Goods that are in fashion are purchased by consumers regardless of price even at a higher price. Consumers purchases the goods which are in fashion.

REASONS UNDERLYING THE LAW OF DEMAND OR REASONS FOR THE DOWNWARD SLOPE OF DEMAND CURVE

The downward slope of the demand curve implies inverse relationship between demand and price of a commodity. Following are the reasons for the downward or negative slope of the demand curves.

1. Law of Diminishing Marginal Utility. The utility of an additional unit of a commodity is the Marginal Utility (MU). Utility is the basis of demand. Law of diminishing marginal utility states that marginal utility of a commodity diminishes when a consumer takes successive units of a commodity. In order to maximise satisfaction a consumer will stop the

purchase of the commodity when MU equals its price (MUX = Px). When the price of the commodity falls the consumer will purchase more units of the commodity so that MU falls to equal the price. If the price rises, the opposite happens.

2. Income Effect. As the price of a commodity falls, the real income or purchasing power of the buyer increases because he can purchase the same quantity of the commodity with lesser amount of money at a lower price. A part of the increase in his real income may be used to purchase more of the cheaper commodity while remaining part may be spend on other goods. This is the income effect of fall in price. Therefore, when price falls, the quantity demanded increases due to increased real income and vice-versa.

3. Substitution Effect. When the price of a commodity falls, it becomes relatively cheaper in comparison to its substitutes. Therefore, the consumer would prefer to substitute, this cheaper commodity for other goods whose business analyst should keep this factor in mind while forecasting demand of durable goods.

4. Propensity to Save. Demand for goods is affected by change in propensity to save Increase in propensity save means less money is available to the purchase of goods. The demand, therefore, will decrease with increase in propensity to save.

5. Advertisement Expenditure. Increase in advertisement expenditure up to a certain stage, increase the demand rapidly by influencing consumer's choice and preferences, and setting new fashion trends. Generally advertisement expenditure leads to increase in demand by creating want for the commodity among people". Advertisement manipulates demand.

6. Several uses. When the price of commodity falls, that commodity may be put to several uses and hence demand for it will rise.

7. Others. There are other factors such as demonstration effect, product improvement; educational standard, etc. affect the demand.

ELASTICITY OF DEMAND

It is true that the demand for a commodity depends on its price, tastes, habits and preferences, income of the consumers etc. A change in any of these factors leads to a change in quantity demanded. If we treat all the other factors as constant except the price, then we can relate the quantity demanded to the price of that commodity. Such a relationship has been explained to us by the Law of Demand.

The law of demand which explains the “direction of change” in the quantity demanded to a given change in price. The law, however, does not measure the rate of change or degree of change. The arte of change may differ according o the nature of commodities. In case of salt the rate of change in quantity demanded may be negligible in relation to a change in its price, while in case of an expensive car the rate of change in quantity demanded may very large.

Elasticity of demand measures the rate of change in the quantity demanded to a given change in any of the determinants of demand such as price of the commodity, price of related goods, money income of consumers, advertisement tastes, etc.

In the words of Marshall, "the elasticity (or responsiveness) of demand in market is great or small according to the amount demanded increases much or little for a given fall in the price and diminishes much or little for a given rise in price".

Elasticity is thus a technical term that is used by the economists to describe the degree of sensitiveness (or responsiveness) of the demand for a commodity to a fall in its price.

Marshall's concept of elasticity may be referred to as 'price elasticity' as he used this concept only with reference to price changes. However, today, economists nave extended the application of the concept of elasticity to several other variables. This gives us the different types of elasticity of demand viz. price elasticity of demand, income elasticity of demand and cross elasticity of demand.

TYPES OF ELASTICITY OF DEMAND

(i) Price-elasticity of demand: Price-elasticity of demand is the degree of responsiveness of the demand for a commodity to a change in the price.

Ed = Proportionate change in quantity demanded
Proportionate change in price

(ii) Income-elasticity of demand : It is the response of change in demand to the change in the income of an individual.

Income-elasticity of demand may be defined as the responsiveness of demand for commodity to changes inn income, other determinants remains constant.

Ey= Proportionate change in quantity demanded
Proportionate change in income

(iii) Cross-elasticity of demand : It is the response of change in demand for 'X’ good (tea) to the change in the price of 'y' good (coffee).

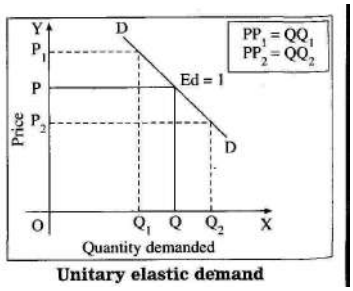
Ec= Proportionate change in quantity demanded of commodity ‘X’

Proportionate change in price OF commodity Y

TYPES OF PRICE ELASTICITY OF DEMAND.

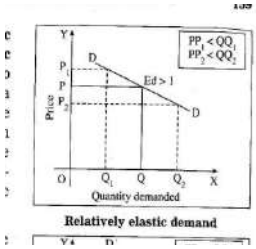
Price elasticity of demand can be defined as the percentage change in the quantity of a commodity demanded in response to a given percentage change in its price. The following are the different types of price elasticity of demand :

(1) Unitary elastic demand: The demand is said to be unitary elastic when proportionate change in the price brings about exactly equal proportionate change in the quantity demanded. The numerical value of unitary elastic demand is one.



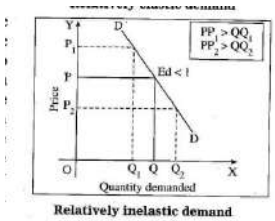
Unitary elastic demand

(2) Relatively elastic demand or More elastic demand: The demand is said to be relatively elastic when a proportionate change in the price brings about greater than proportionate change in the quantity demanded. The numerical value of relatively elastic demand is greater than one.



Relatively elastic demand

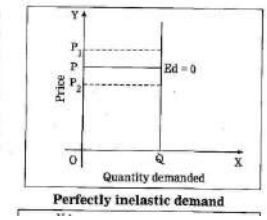
(3) Relatively inelastic demand or Less elastic demand: The demand is said to be relatively inelastic when a proportionate change in the price brings about less than proportionate change in the quantity demanded. The numerical value of a relatively inelastic demand is less than one.



Relatively inelastic demand

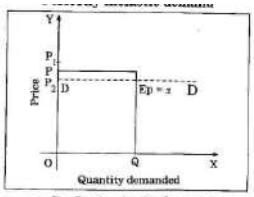
(4) Perfectly inelastic demand: The demand is said to be perfectly inelastic when a

proportionate change in the price brings about no (zero) proportionate change in quantity demanded. The numerical value of a perfectly inelastic demand is zero.



Perfectly inelastic demand

(5) Perfectly elastic demand : The demand is said to be perfectly elastic when a slight proportionate change in the price brings infinite (unlimited) proportionate change in quantity demanded. The numerical value of a perfectly elastic demand is a.



Perfectly elastic demand

Measurement of Elasticity of Demand

The numerical coefficient ranges from zero to infinity. Thus, now let us understand the different methods to measure the 'exact' change in quantity demanded to the change in price.

From practical point of view, it is not enough to know whether the demand for a commodity is elastic or inelastic. The concept becomes more fruit-bearing, if it can also suggest the exact numerical change in demand corresponding to price. For this purpose it is necessary for us to measure' elasticity of demand.

I. Ratio-Proportion Method

II. Point Method

III. Total Expenditure Method.

I. Ratio-Proportion Method: The price elasticity of demand according to this method can be measured by dividing the percentage change in the quantity demanded by percentage change in price. The formula used for the measurement of elasticity is as follows :

$$\text{Price elasticity of demand} = \frac{\%\text{ or proportionate change in demand}}{\%\text{ or proportionate change in price}}$$

.

With the help of the following example the ratio method can be explained:

	Price	Demand

Original	50	10
New	60	05

$$Ep = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q} = \frac{Q_1 - Q}{P_1 - P} \times \frac{P}{Q}$$

$$Ep = \frac{5 - 10}{60 - 50} \times \frac{50}{10} = \frac{5}{10} \times \frac{50}{10} = \frac{25}{10}$$

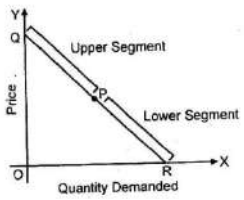
Ep = 2.5

As the numerical value of elasticity of demand is greater than one, the demand is relatively elastic or more elastic.

II. Point Method (or Geometric Method)

Point Method of measuring price elasticity of demand has been explained by Prof. Alfred Marshall.

When elasticity is measured at a point on a straight-line demand curve, it is called point elastic' of demand.



For convenience, we first take a linear or a straight-line demand curve. Extend it to join the two axes (OX and OY) and name it QR. Take any point on the demand curve, say 'P'. Point 'P' has divided the straight line into two segments - upper segment and the lower segment.

Elasticity at any one point is the ratio of the lower segment of the straight line to the upper segment.

$$\text{i.e.} \quad e_d \text{ at point p} = \frac{\text{Lower segment}}{\text{Upper segment}} \quad \text{(or)} \quad \frac{PR}{PQ}$$

III. Total Expenditure Method.

The total outlay or expenditure method was given by Alfred Marshall. It is also called as total

revenue method. With the help of the following demand schedule, the elasticity of demand can be measured :

Price (in Rs.)	Quantity demanded	Total outlay (in Rs.)	Value of elasticity	Type of demand
1	8	8		Relatively
2	7	14	Ed<1	Inelastic
3	6	18		Demand
4	5	20		Unitary
5	4	20	Ed = 1	Elastic
				Demand
6	3	18		Relatively
7	2	14	Ed>1	Elastic
8	1	8		Demand

(1) Relatively inelastic demand: The demand is said to be relatively inelastic when with a fall in price the demand rises but total outlay falls or when with a rise in the price the demand falls but total outlay rises than earlier. Thus, in this type, the price and total outlay move in the same direction.

(2) Unitary elastic demand : The demand is said to be unitary elastic when with a fall or rise in the price, the demand rises or falls respectively, but the total outlay remains constant.

(3) Relatively elastic demand : The demand is said to be relatively elastic when with a fall in the price, the demand rises and the total outlay also rises or when with a rise in the price, the demand falls and the total outlay also falls than earlier. Thus, in this type, the price and total outlay move in opposite direction.

Factors determining elasticity of demand

The demand for a commodity is elastic or inelastic will be determined by a variety of factors :

(i) Nature of commodity : Elasticity of demand depends upon whether the commodity is a necessity or a luxury. The demand for salt would remain more or less the same whatever is its price. But for luxuries like perfumes, TV sets etc. the demand would be highly elastic. In other words, necessaries face an inelastic demand while luxuries have a more elastic demand.

(ii) Existence of substitutes : If any commodity has a close substitute, its demand is more elastic. If the price of such a product rises, a consumer can switch to the substitutes. Hence, a slight rise in price is followed by a sizeable fall in the demand for it and vice versa. For example, different types of shampoos are close substitutes of one another and one can expect the effect as mentioned above.

(iii) Income : Elasticity of demand also depends upon the income group of the consumers. The demand from the high and low income group for most of the commodities is inelastic. There is generally no interchange of market between the low and high income group.

(iv) Habits : Demand for the more habit-forming commodities is inelastic. The reasons for it are - habits die hard and hence the consumer continues spending on such commodities, whatever is the price. And, further because the commodity concerned usually does not have a dose substitute.

(v) Multiple uses : Products having multiple uses generally have elastic demand, e.g. electricity, sugar, milk, wood, steel etc. When the price of electricity rises, we reduce the demand of it in some uses. On the other hand, when price falls, we increase its use.

(vi) Durable goods: Demand for durable goods is inelastic, as such goods are not purchased again when the price changes, e.g. furniture, music system etc.

(vii) Recurring demand : Goods that have recurring demand face elastic demand, e.g. CD's,

(viii) Joint Demand : The demand for complementary goods is inelastic, e.g. car and petrol.

(ix) Postponement : When consumption of a commodity can be postponed, the elasticity of demand for it is elastic. On the other hand, when the consumption of a good cannot be postponed, the elasticity is inelastic, e.g. medicine.

(xi) Cheap goods : The smaller the proportion of a consumer's income spent on the commodity, the more inelastic is the demand for such a commodity, e.g. if the price for safety pins increases by 20 percent, mere will hardly be any effect on the demand for pins. The reason is that safety pins claim an insignificant part of the consumer's income.

Significance of Elasticity of Demand

The concept of elasticity of demand is of immense importance in economic practice. The usefulness of this concept further increases because of the measurability of elasticity,

(i) Price policy of firms : With a view to maximise its money profits, a firm has to decide upon the right type of price policy. When the demand is highly elastic, it pays the firm to reduce the price slightly and cause a significant increase in sales. Thus, it can reap high profits. Conversely, with an inelastic demand, it pays the firm to restrict the supply for slashing down its cost of production and allow the price to rise, thereby increasing its profitability.

(ii) Taxation policy : The concept of elasticity assists the government in formulating its economic and tax policies. For example, the Finance Minister keeps in mind the nature of

elasticity of demand for a commodity before imposing excise duty on it. Taxes on products with an inelastic demand are highly productive in revenue to the government. Similarly, government considers the elasticity of a product before imposing statutory price control on it.

(iii) Terms of trade : By considering the elasticities of demand of the two countries, terms of trade between them can be calculated.

In other words, the relative elasticities of demand for the goods of the trading countries will dictate the terms of trade.

(iv) Pricing of factors : The rewards of the factors of production i.e. rent, wages, interest and profit to land, labour, capital and entrepreneur respectively, will depend upon the elasticity of demand for them. For example, if the demand for labour is relatively inelastic, it will be paid high wages.

(v) Income policy : Because the demand for foodgrains is inelastic, a bumper crop of foodgrains results in a collapse of agricultural prices. This causes a fall in the income of the farmers.

(vi) Scope of public sector : The concept of elasticity is useful for deciding upon the scope of the public sector. Several commodities especially public utilities face an inelastic demand. The private producers under such circumstances are likely to exploit consumers. Such fields can preferably be taken by the government in the public sector.

(vii) Trade union : The concept is useful to trade union leader in wage bargaining. When the demand for the industry's produce is fairly elastic, union can bargain for a high wage by suggesting the producer to lower the price and increase the sales which would compensate for his loss by high wages.

DEMAND OR SALES FORECASTING

DEMAND FORECASTING

Demand forecasting refers to forecasting sales of a commodity or commodities for future period. In the words of Cundiff and Still, "Sales forecast is an estimate of sales during a specified future period which is tied to a proposed marketing plan and which assumes a particular set of uncontrollable and competitive forces."

Thus, in simple words, Demand forecasting is an estimate of future sales. From a firm's point of view, Demand forecasting means estimating in advance its share in the total market demand. This estimate is made considering various factors—controllable and non-controllable and present and anticipated market conditions.

FACTORS INVOLVED IN DEMAND FORECASTING

(i) Period of Forecasting. Demand forecasting may be short-term or long-term. A short-term demand may cover a period of three months, six months or one year but not exceeding one year and long forecasting covers a period exceeding 5 years. A business should forecast short term as well as long term sales/demand for its products to have a clear view of business activities. Thus, short term forecast is one which provides information for day to day operations within the limits of resources currently available. Whereas long term forecasting is more concerned with decisions extending or reducing the units of resources.

(ii) Demand forecasting may be undertaken at three different levels.

(a) Marco level. It is concerned with business conditions over the whole economy measured by an approximate index of industrial production, national income or expenditure. This kind of external data covers the basic assumptions on which the business must have a base for its forecasts.

(b) Industry level. This includes the preparations of sales forecasting by different trade associations.

(c) Firm level. It is an important matter from the managerial view point. Individual firms' forecast their sales.

(iii) The forecast may be general or specific. General forecast may be useful for the firm but it also needs commodity forecasts and sales area forecasts (specific forecasts).

(iv) As far as the new products are concerned, methods and problems for forecasting are quite different from products already established in the market as sales trends are known better and the competitive nature is well known. Thus, the methods and problems should be studied accordingly.

(v) Products are to be classified under capital goods and consumer durable or non-durable goods and services. There are distinct patterns of demand for different category of these economic analysis.

(vi) In every forecast, every product has special factors of its own. If there is competition in the market, situation is complicated unto what extent with uncertainty or unmeasurable risk, error or inaccuracy in the forecast requires consideration.

PURPOSES OF FORECASTING

Forecasting, according to time may be of two types—short term and long term. The purposes of forecasting may be different according to types of forecasting.

(a) Short-term Forecasting

(i) Evolving suitable **production policy** so as to avoid the problem of over-production and under-production.

(ii) Helping the firm in **reducing cost** of purchasing raw materials and controlling inventory by assuring regular supply of raw materials.

(iii) Determining **appropriate price policy** so as to avoid an increase when the market conditions are expected to be weak and a reduction when the market is going to be quite strong.

(iv) **Setting sales targets** and establishing controls and incentives. If targets are set too high, they will be discouraging salesmen who fail to achieve them; if set too low, the targets will be achieved easily and hence incentives will prove meaningless. A comparison between targeted sales and actual sales will help the management control selling and salesmen activities.

(v) Forecasting short term financial requirements. Cash requirements depend on sales level and production operations. Sales forecasts enable arrangement of sufficient funds on reasonable term well in advance.

(vi) Regular availability of labour. Sales forecasting helps management in arranging the labour force (trained and untrained) for maintaining a continuous flow of production and to avoid any obstruction in the process of production due to shortage of labour and to avoid the problem of surplus labour.

(b) Long-term Forecasting

(i) New unit planning or expansion of an existing unit A long term demand forecasting helps to plan for new units or at the same time existing units to expand their activities. A multi-product firm must determine total demand situation and the demand for different items.

(ii) Planning for long term financial requirements. If the demand is more and it takes long time then such long term financial requirements could be planned and funds may be arranged and made available at the right time.

(iii) Man power planning. The availability of trained and experienced manpower in requisite number should be planned in advanced on the basis of long term sales forecasting. Training and personnel development are long term preposition and need considerable time to complete. The development of these two potentials should be planned well in advance.

CRITERIA OF A GOOD FORECASTING METHOD

A good system of forecasting must have the following qualities :

1. Simplicity and Ease of Comprehension. Management must be able to understand and have confidence in the techniques used. Complicated mathematical and statistical techniques may be avoided.

2. Economy. Cost must be weighed against the importance of the forecast to the operations of the business. The criticism should be the economic consideration of balancing the benefits from increased accuracy against the extra cost of providing the improved forecasting.

3. Availability. Techniques should give quick results and useful information.

4. Durability. Durability of the forecasting power of a demand and functions depends on reasonableness and simplicity of functions fitted.

5. Accuracy. Sales forecasting is the basis of marketing planning and, therefore, sales forecasts should be as much accurate as possible.

IMPORTANCE OF DEMAND OR SALES FORECASTING

Accurate demand forecasting is essential for a firm to enable it to produce the required quantities at the right time and arrange well in advance for the various factors of production. The producer can frame a suitable production policy. The firm can reduce cost of purchasing raw materials. It also enables the firm to adopt suitable price policy. It is on the basis of demand and sales forecasts that arrangements are made for raw materials, equipments, machine accessories, labour and buildings well in advance and at the right time.

Demand forecasting is very popular in industrially advanced countries. Demand forecasting is become more important with the growing industrialisation of the country.

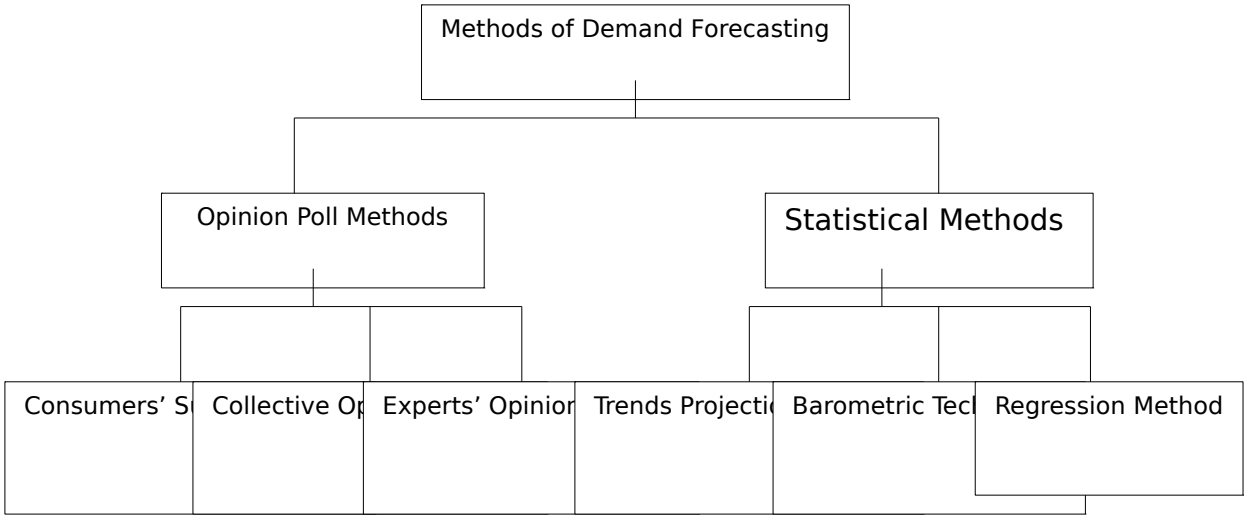
A firm can maximise its profits only when it produces on the basis of the demand of its products. There will be no problem of over and under production if the figure of sales forecasts is accurate. As it will reduce or have control over costs, the profits will certainly go up. The importance of sales forecasting is much more in large sale or seasonal industries.

On the national level, sales forecasts of particular products may provide guideline for demand forecasts for related industries. For example, a demand forecasts for cotton textile may provide an idea of probable demand for textile machinery, ready-made garments.

METHODS OF DEMAND FORECASTING

Demand forecasting is a very absorbing and difficult exercise. Making estimates for future under the changing conditions is a difficult task. Consumer's behaviour is the most unpredictable thing in the world because it is motivated and influenced by multiplicity of forces. Moreover, economists and statisticians over the years have developed several methods

of demand forecasting. Each of these methods has its relative merits and demerits. Selection of the right method is essential to make demand forecasting accurate and credible.



1. Survey Method. The most direct method of forecasting demand in the short-run is survey method. Surveys are conducted to collect informations about future purchase plans of the probable buyers of the product. The surveys may be conducted by direct interview of buyers or by mailing questionnaire asking the potentional buyers about their future purchase plans. Survey can be a census survey or sample survey. Census survey is applied when the potential buyers are living in a limited region or area. But generally, sample survey method is preferred because it is less costly and less time consuming in comparison to census method. On the basis of quantities of demand reported by probable buyers sales forecasts are prepared by sensible analysis of the collected informations. The survey data can be used directly to prepare forecast. The utility of survey method is that the factors having impact on demand can be identified. This method can be very useful for making forcast of the demand for new products.

But there are certain limitations of this method. Firstly, probable buyers themselves may not be aware of their demand: Thus the information so collected may be less authentic. Secondly, the purchasers may change their purchase plans. This is particularity possible in case of consumers goods. Thirdly, the household consumers are many which make this method costly and impracticable.

2. Sales Force Opinion. This method is also know as Collective Opinion method. The

salesmen are the nearest persons to the customers and are able to judge their mind and market conditions. They better understand the reactions of the customers to the firm's products. Therefore, they are in a position to provide estimates of probable demand in their regions or areas. According to this method each salesman is asked to estimate the probable demand in his or her area of operation. The estimates of different salesmen are collected and added together to forecast the probable sales. To ensure greater accuracy the estimates given by salesmen are checked in the light of opinion of marketing professionals and consultants. Thus, the final estimates of demand are prepared. The method make use of collective wisdom of sales force. This method has certain advantages and limitations.

Advantages : (1) It is simple method-involving no mathematical calculations.(2) It is based on the first hand knowledge of salesman and the persons directly connected with sales. (3) This method is particularly useful for the sales forecast of new products.

Limitations : (1) It is a subjective approach. Thus possibility of over estimates there.

(2) Suitable for short-term forecasts only. (3) All salesmen may not be good estimators. (4) Moreover the sales-people consider only the regional factors. Factors of wider implications, such as general business and economic conditions are not considered.

3. Executive Opinion Method. Under this method, opinions are sought from the executives of different disciplines, i.e., marketing, finance, production, etc., and estimate for future sales are prepared on their opinions. Thus, this is a process of combining, averaging, or evaluating in some other way the opinions and views of the top executives. Opinions of outside experts may also be sought to examine the views of executives to arrive at final estimates of demand.

Advantages. (1) The forecasts can be made speedily by analysing the opinions and views of top executives. The technique is quite easy and simple. (2) There is no need of collecting elaborate statistics for the forecasts, hence it is not much expensive. (3) In the absence of adequate data it is the only feasible method to be followed.

Disadvantages. (1) There is no factual basis of such forecasts, so, the method is inferior to others. (2) Accuracy cannot be claimed under this method. (3) Responsibility for the accuracy of data cannot be fixed on anyone.

4. Market Experimentation. Market experimentation technique involves examining consumers behaviours under actual, though controlled, market conditions. Under this method, the firm selects some representative markets in different cities or areas having similar characteristics such as population, income levels, occupational structure of buyers, etc. After

this market experiments are conducted by varying prices, advertising and other controllable variable in the demand functions to know the reaction of consumers over a. period of time. The impact as change 'in demand-determinants on the demand of the product are recorded weekly or fortnightly over a period of time on the basis of data so collected the demand forecast for the product are prepared. The method of controlled experiments, is quite new and useful. But it has certain limitations.

(i) The method is expensive and time consuming. (ii) It is risky because it may lead to unfavourable reactions on dealers, consumers and competitors. (iii) Difficulty of planning. It is not always easy to determine what conditions should be taken to be constant and what factors should be regarded as variable so as to separate and measure their influence on demand, (iv) Difficult to satisfy the homogeneity of markets. It is hard to satisfy, the homogeneity of market conditions.

The main quantitative demand forecasting techniques are :

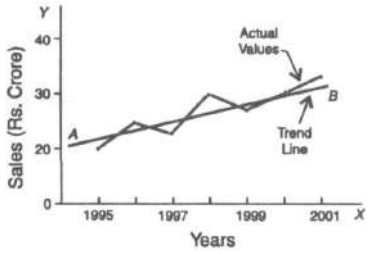
1. **Trend Projection Method.** Output and sales of a firm may increase or decrease over a period of time however, it has a distinct tendency either to increase or decrease in the long run. Such long run tendency of a time seriece to increase or decrease over a period of time is know as a trend. Several methods can be used to measure the trend the important are give below:

   a. **Graphic Method :** This is the most simple technique to determine the trend. All values of output or sales for different years are plotted on a graph and a smooth freehand curve is drawn passing through as many points as possible. The direction of this free-hand curve—upward or downward—shows the trend.

Table : Sales of Firm

Year	Sales (in Crore)
1995	20
1996	25
1997	22
1998	30
1999	27
2000	31
2001	35

In Fig.1 AB is the trend line which has been drawn as a freehand curve passing through the various points representing actual sale values.



The disadvantage of this method is that it may show the trend but lot measure it. Similarly, smoothing of fluctuations by a freehand curve ' leave chances of bias on the part of investigator.

b. **Least Squares Method.** The least squares method is a mathematical lure for fitting a line to a set of observed data points such that the sum squared deviations between the calculated and observed values is In estimation, both positive and negative errors may arise. We i all these errors and try to minimise the sum of squares of these errors, the name of the method is 'least squares method'. This technique is I to find a trend line which 'best fits' the available data.

2. Barometric Techniques: The barometric technique of demand forecasting is based on the assumption that the future can be predicted from certain event occurring in the present. We need not depend upon the past observations for demand forecasting. Different economic indicators such as income, population expenditure, investment, etc., can be used to predict the market trend. For example, index of farm income can be a good indicator for estimating demand for agricultural input like fertilizers, tractors, etc. Similarly, personal income can be a good indicator for estimating demand for consumer goods. Data relating to economic indicators is published by specialised organisations.

In order to use barometric techniques for demand forecasting certain steps have to be followed :

1. To determine whether a relationship exists between the demand for a product and certain economic indicator.
2. Establishing relationship between demand and economic indicator through the method of least squares and deriving the regression equation. In case the relationship is linear, equation will assume the form : y = a + bx. For non-linear relationship parabolic functions can be used.
3. Once regression equation is derived, the value of y, *i.e.,* demand, can be forecast for a given value of *x.*

4. Past data may not prove adequate for forecasting, therefore, the investigator should use his judgement taking into consideration the new factors as well.

Certain limitations arise in the use of this method of forecasting. For example, it is not always possible to get an appropriate indicator. In case of new product, no past data exist hence forecasting becomes difficult. The success of this method depends upon the time lag between the economic indicator and demand. If no time lag exists, use of this method becomes difficult.

3. **Regression Method**: Regression method is frequently used in demand forecasting. Under this method, relationship is established between quantity demanded and one or more independent variables such as income, price of the related goods, price of the commodity under consideration, advertisement cost, etc. In regression, a quantitative relationship is established between demand which is a dependent variable and the independent variables, i.e. determinants of demand.

Let us suppose that we have two variables y and x, where y is dependent on x. It can be expressed in the form of an equation as follows:

$$y = a + bx$$

Since this is a linear relation, a study of regression in this case will be that of linear regression. If the relation is curvilinear, the study of regression in such a case is called curvilinear regression.

METHODS TO FORECAST THE DEMAND FOR OLD PRODUCTS

1. Trend Analysis.
2. Correlation and Regression Analysis.
3. Customers Opinion Survey Approach.
4. Experts Opinion Survey Approach.

METHODS TO FORECAST THE DEMAND FOR A NEW PRODUCT

To prepare a forecast of demand for old and traditional commodities is comparatively easier than to prepare a forecast for a new product because the statistics of sale of the past years are available in the case of old brands. Here we mention below some of the popular

methods that are adopted to forecast the demand for a new product.

1. Substitute Approach. A survey of the demand of a close substitute is conducted to prepare forecast of approximate sales of a new product. But care should be taken that the qualities of the new product must come very close to the substitute.

2. Evolutionary Approach. This approach is based on the assumption that the new product will be considered just an improved form of some old product by the consumers. It is on the basis of sales in the past years of that old product, forecast of demand for the new product is prepared.

3. Buyers Points of View. Possible buyers and customers are contacted and they are familiarised with the qualities of the new product. Their opinions are processed and on the basis of which forecast of demand and sales is prepared.

4. Expert's Opinion. It is on the basis of the sales experts views, distributors opinions on the basis of which the sales forecast is prepared.

5. Market Test Method. According to this method sale of the new product is organised for a fixed time in a particular area or market on trial basis. It is on the basis of the response of the customers that the forecast of the whole market sales for the year is prepared.

-x-x-x-x-x-x-