UNIT -1

INTRODUCTION TO MANAGERIAL ECONOMICS [ME] & DEMAND ANALYSIS

INTRODUCTION:

Managers in their day-to-day activities are always facing with several issues like,

- What kind of products to be produced?
- How much quantity to be produced?
- At what price to be sold out?
- Whether is it to be produced internally, or bought from outside?
- What profit to be decided? etc.

ME provides to the organizations into seeking solutions for managerial problems.

ME as the name itself implies two different disciplines i.e., Management & Economics.

Management:

It is a process, an activity, a discipline to co-ordinate, control and direct individual and groups towards achievement of business goals.

Def : Acc. to Koontz & O' Donell - *Management is art of getting things done, through and with the people.*

Manager - the person who manages the business activities is known as a manager. He directs the resources like Men, Material, Money, and Machines & Technology to commit the organizational goals.

Economics:

The term economics is derived from the Latin word, okio and nomeos . This means household administration.

It is a study of human activities both at individual and national level. The economists of early age treated that economics merely as the science of wealth.

The reason for this is clear. everyone of us is involved in efforts aimed at earning money and spending this money to satisfy human wants like food, clothing, shelter and others.

Def: In 1776, Adam Smith in his book "Wealth of Nations", Economics *analyses the nature of wealth, principles of production and distribution.*

But, Prof. Alfred Marshall was criticized; wealth cannot be the ultimate goal of a man.

Prof. Alfred Marshall, in 18th century in his book 'Principles of Economics', *Economics is the study of man's action in ordinary business of life, it enquires how he gets his income and how he uses it.*

This was focused to promote human welfare.

In 19th century, Lionel Robbins, *Economics is a Science which studies human behavior as a relationship b/w ends and scarce means which have alternative uses.*

The above definition having 4 features:

- *unlimited wants (ends)*
- *scarce resources (means)*
- *alternative uses*
- *Choice.*

Economics can be classified into two ways;

A) Micro Economics B) Marco Economics

Micro Economics studies about individual consumer or a firm. This is also known as theory of firm. Always it deals with behavior and problems of single individual. It is concerned with the concepts of price theory, Law of Demand and Market Theories and so on.

Macro Economics is the study of aggregate or total level of economic activity in a country. It studies the flow of Economic resources of production like Land, Labor, Capital and Organization from the owner to the business firms and then business firms to the households. it deals with the total aggregates. Ex: total national income, total employment, output and total investment, total consumption etc.

Managerial Economics

The term Managerial Economics was introduced by Joel Dean in **1951** in USA. It is also known as Business Economics and Industrial Economics.

According to him, ME shows *how economic analysis can be used in formulating business policies.*

Acc. to Brigham and Pappas; ME is *the application of Economic Theory and Methodology to business administration practice*.

Acc. to Michael R. Baye, ME *is the study of how to direct scarce resources in a way that most efficiently achieves a managerial goal*.

Acc. to Spencer and Siegelman, *the integration of Economic Theory with business practice for the purpose of facilitating decision making and forward planning by manager.*

Nature & Features of Managerial Economics:

ME is the youngest of all social sciences. Since it originates from economics; it has basic features of economics. This assumption is made to simplify the complexity of the managerial phenomenon under study in a dynamic business environment so many things are changing continuously.

Features of ME:

a) Close to Micro Economics - it is concerned with finding the solutions for different managerial problems of a particular firm. this is very close to micro economics.

b) Operates against the backdrop of Macro Economics - the Macro Economics conditions of the economy are also seen as limiting factors for the firm to operate. the Managerial Economist has to be aware of the restricting the Macro Economic conditions such as, Government Industrial Policy, Inflation, Environmental changes so on.

c) Normative Statement - it usually include the words ought or should. they reflect peoples moral attitudes and are expressions of what a team of people are to do.

ex: purchasing capacity, consumption level, family distribution etc.

d) Inter Disciplinary - the contents, tools and techniques of me are drawn from different subjects such as economics, management, mathematics, statistics, accountancy etc.

e) Applied In Nature - models are built to reflect the real life complex business situations and these models are of immense help to managers for decision making by using different techniques like inventory control, optimization, project management etc.

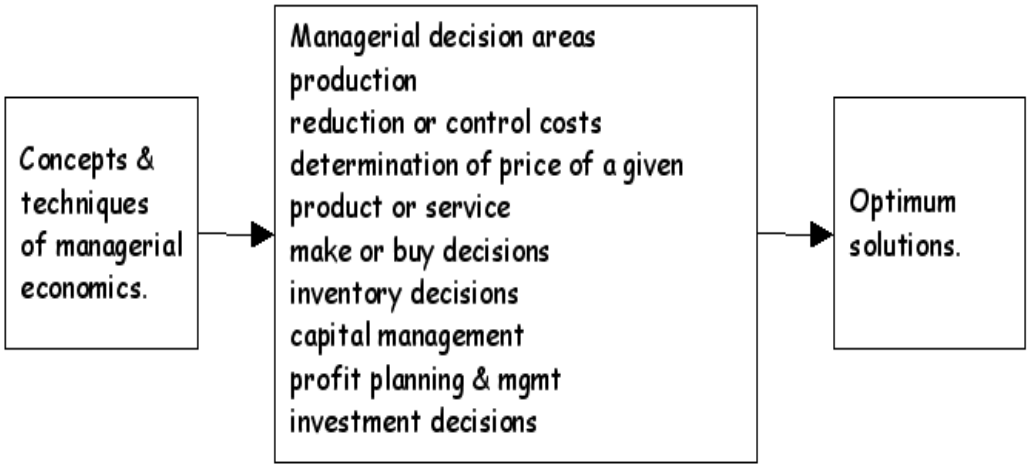
f) Prescriptive Action - it is goal oriented. given a problem and the objectives of the firm, it suggests the course of action from the available alternatives for optimal solutions.

g) Offers scope to evaluate each alternative - it provides an opportunity to evaluate each alternative in terms of it expenses and revenues. ME can decide which is best alternative to maximize the profits of the firm.

h) Assumption & Limitations - every concept and theory of ME is based on certain assumptions and as such their validity in not universal. where there is change in assumptions, the theory may not hold good at all.

SCOPE OF MANAGERIAL ECONOMICS

The main focus in ME is to find the solutions to a given managerial problem. like as production and reduction or control of cost, price fixation, make / buy decisions, inventory decisions, capital management, investment decisions etc. To solve the above managerial problems managerial economist use of the concepts, tools and techniques of economics and other related discipline.



- ✓ **Demand Decision**: the analysis and forecasting of demand for a given product and service is the first task of managerial economist. the impact of price changes, income levels and prices of alternative products are assessed accordingly the decisions are taken to maximize the profits.

- ✓ **Input - Output Decisions**: cost behavior at different levels of production is assessed. some costs are fixed, semi - variable & variable. the quantity of the production changes with additional increase in inputs. it is necessary for the manager to know the relationship between the cost and output both in short run and long run.

- ✓ **price - output decisions**: after the production is ready and the task is to determine the price based on different market situations.

- ✓ **Profit related decisions**: business firm can introduce the techniques like break - even analysis, ratio analysis, cost reduction, cost control to ascertain the level of profits.

- ✓ **Investment decisions:** manager needs to be more attentive while committing his scarce resources which has alternative uses. The allocation and utilization of the investments is of parallel importance.

- ✓ **Economic Forecasting & Forward Planning:** the firm operates in ever changing environmental factors like, customer preferences, government policies, competition, finance & technology etc. it is required to forecast the trends in the economy to plan for the future in terms of investments, profits, products and markets.

ME relation with other disciplines (subjects)

Managerial Economics is having very close relation with different disciplines.

- **Economics** - ME concept is basically economic concept in addressing the various managerial problems such as, demand function, cost function, revenue function and so on. are extensively used. Economics and ME both are concerned with the problems of scarcity and resource allocation.

- **Mathematics** - Managerial Economist is concerned with estimating and predicting the relevant economic factors for decision making and forward planning. He makes use of the tools and techniques of mathematics like algebra, calculus, vectors, integrations etc.

- **Statistics** - it deals with different techniques used to analyze the cause and effect relationships in a given variable. Managerial Economist makes the use of statistical techniques like averages, measures of dispersion, correlation, regression, time series, probability etc.

- **Psychology** - business firm assumes that the behaviour of the consumer is always rational, which is reality is not so. psychology contribute towards understanding the behaviour of consumer, supplier, seller, investor, worker and so on.

- **Accountancy** - the accountant provides accounting information relating to costs, revenue, receivables, payables, profit/ losses etc. and this forms basis for the Managerial Economics to act up on. The main objective of accounting function is to record;, classify, and interpret the given information. Managerial Economist purely depends on this information for decision making and forward planning.

- **Organizational Behavior** - it enables the managerial economist to study and develop behavioral models of the firm integrating the managers' behavior with that of the owner.

- **Operations Research** - Decision making is the main focus in OR and ME. if ME focuses on solving the managerial problems through OR models such as linear programming, queuing, transportation, optimization techniques and so on are using in solving the managerial problems.

DEMAND ANALYSIS

Demand is an economic principle referring to a consumer's desire to purchase goods and services and willingness to pay a price for a specific good or service.

A product or Service is said to have demand when 4 conditions are satisfied.

a) Able to Buy / Capacity to Buy
b) Willing to Buy
c) At prevailing Price
d) In a given period of time.

Acc. to **Benham**, *Demand for anything at a given price is the amount of which will be bought per unit of time and that price*.

Types of Demand:

Demand can be classified into different types.

1) **Consumer Demand & Producer Demand** : demand for consumer goods like bread, pens etc is known as consumer demand. Demand for producer products like machinery, spare parts etc. which needs further production process and thus income generation.

2) **Durable Demand & Perishable Demand**: Demand for durable goods like Television, car etc which can be consumed for longer period is called durable demand. Demand for the goods which can be used for once is known as perishable demand. ex: milk, vegetables etc.

3) **Firm demand & Industry Demand**: The firm is a single unit and industry is collection of the same type/ nature of firms. the quantity of goods demanded by a single firm is Firm Demand, Quantity of demanded by industry as a whole is Industry demand.

   Ex: demand for two wheelers is industry demand & demand for a particular model of two wheeler is firm demand.

4) **New demand & Replacement Demand**: Demand for new products and it is addition to the existing product is new demand. Demand for a product replacing with old one is called replacement demand.
   Ex: buying a new car is new demand & exchanging TV with old one is replacing demand.

5) **Short run demand & Long run demand**: Joel Dean defines short run demand as the demand with its immediate reaction to price changes, income fluctuations and so on. Long run is that demand which will ultimately exist as a result changes in pricing, promotion, and product development after sufficient time is allowed to let the market adjust.

6) **Autonomous Demand & Derived Demand**: Autonomous Demand refers to the demand for a products and services directly. Ex: demand for a super specialty hospital services. demand for the hotels, medical shops around that hospital is derived or dependent demand.

7) **Total Demand & Segment Demand**: Demand for a particular product consumption in a particular region is total demand. demand for same product in particular area is called segment demand. Ex: demand for dress materials in AP is total demand and demand for dress materials in Guntur is segment demand.

LAW OF DEMAND:

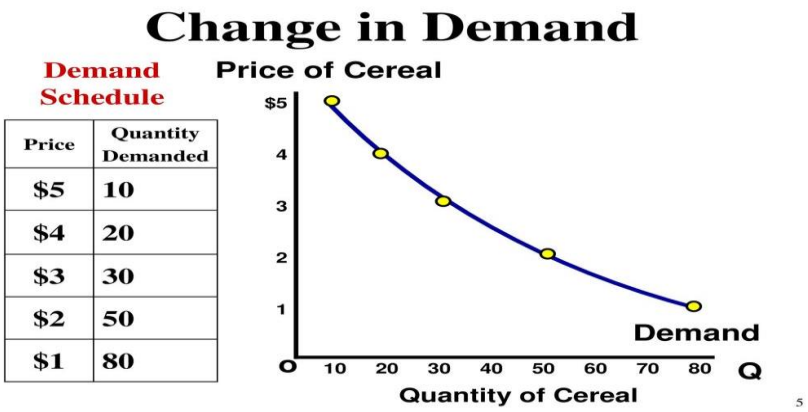
It shows the relationship between price and quantity demanded of a commodity in a market.

Acc. to Marshall, *"the amount of demand increases with a fall in price and diminishes with a rise price".*

A rise in price of a commodity is followed by a reduction in demand and fall in price is followed by an increase in demand, when other things remains constant.

Demand Schedule: it is a table that shows the quantity demanded of a good or service at different price levels.

Demand Curve: it is a graphical representation of a demand schedule which shows the curve slopes down wards from left to right.



Assumptions or Limitations of Law of Demand: Law of demand is based on certain assumptions.

a) Taste & Preferences should be constant.
b) Income should remains constant
c) Prices of other products should not change
d) there should be no close substitutes for the commodity
e) demand for the commodity should be continuous.

Exceptions of Law of demand:

This law does not hold good in the following cases.

- **Giffen paradox**: people whose incomes are low, purchase more of a commodity like broken rice, bread etc. even its prices are raised. When its price falls instead of buying more, they buy of less of this commodity and use the savings for the purchase of better goods such as meat. Professor Robert Giffen first explained this and therefore it is known as giffen paradox.

- **Veblen/ demonstration effect** : Veblen has explained the exceptional demand curve trough his doctrine of conspicuous consumption. Rich people by certain goods because it gives social prestige. ex: diamonds are bought by rich class for their prestige. if the price of diamonds falls, poor also will buy hence they will not give prestige.

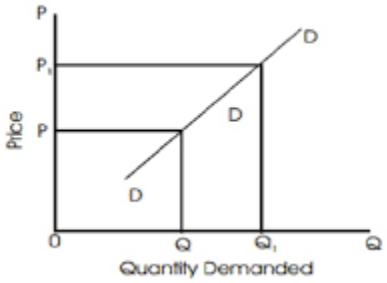
- **Ignorance**: Sometimes the quality of goods judge by its price. Consumers think that the product is superior if the price is high. As such they buy more even at higher price.
- **Speculative effect:** If the price of the commodity is increasing, the consumers will buy more of it because of fear that it increase still

further. Thus an increase in price may not be accomplished by a decrease in demand.

- **Fear of shortage**: During the times of emergency of war people may except shortage of a commodity. At that time, they buy more at a higher price to keep stocks for the future.
- **Necessities**: in case of necessities like rice, vegetables etc, people buy more even at a higher prices.

In all above cases the demand curve slopes upwards or positive slope from left to right.

Figure



DEMAND FUNCTION/DEMAND DETERMINANTS /DEMAND FACTORS

Demand function: It is a function which describes a relationship between one variable and its determinents. It describes how much quantity of goods is bought at alternative prices of good and related goods, alternative income levels and alternative values of other variables affecting demand.
mathematically, demand function can be expressed as

$$Qdn = f(Pn, Pr, Y, T, U)$$

where,

Qdn= quantity of demand for product n
Pn= Price of the product n
Pr= Price of the related goods (substitutes & complimentories)
Y= Income of the consumer.
T= Taste and the preferences of the consumers.
U=other considerations (whether, production, advertisement, consumption, like by child, young, old)

1) **Price of the product**: when the price of the product rises ,the demand falls and vice-varsa. So the demand for the product is inversly related to its price. This is the price demand function showing the price effect on demand.
2) **Income of the consumer:** As the income of the consumer increses, there is a tendency to buy more up to a particular limit, under this view there is a direct or + ve relation b/w demand & income.
3) **Price of substitutes and complimentories**: The demand for a product is determined by the prices its related to products viz,substitutes and complimentories. If there is a increase in the price of substitute, the demand for product X will go up and vice- varsa. Similarly,if the price of complimentory goods goes up, the demand for product X will fall. -ve relation b/w demand and price.
4) **Taste and preferences**: the amount demanded also depends on consumer taste. It includes fashion, habit, customs etc. A consumer taste is also effected by advertisement. If the taste for a commodity goes up to its amount demanded is more even at the same price. This is called increase in demand the oppsite is called decrease in demand.
5) **Whether**: the climate of an area and whether prevailing there has a decisive effect on consumer's demand. In cold areas woolen cloth is demanded. During hot summer days ice creams, cool drinks are very much in demand. In rainy seasons umbrellas are demanded.
6) **Population**: Incase population increases, demand for necessaries of life also increases; the consumption of production also effects on demand. composition of population means the proportion of young, old, and children as well as ratio of men & women. a change in composition of population has an effect on nature of demand for different commodities.
7) **Government Policy**: It effects the demand for commodities by taxation, concessions, subsidy rates etc. If Govt. increases financial assistance the demand for a commodity will be more.
8) **State of Business**: the level of demand for different commodities also depend on the business conditions in the country. if the country is moving through boom conditions there will be a markable increase in demand. On the other hand the demand level goes down during depression.

ELASTICITY OF DEMAND

To understand the increase or decrease in price and its consequential impact of change the quantity of demanded. It is necessary to find out the

extent of increase/ decrease in each of the variable for certain managerial decisions.

The term Elasticity is defined as *'rate of responsiveness in the demand of a commodity for a given change in price or any other determinants of demand'*.

Elasticity of demand was introduced by Prof. Alfred Marshall,. Acc. to him, *"Elasticity of Demand in a market is great or small according as the amount demanded increase much or little for a given fall in price and diminishes much or little for a given rise in the price".*

Elastic Demand: A small change in price may lead to a great change in quantity demanded. In this case demand is Elastic.

Inelastic Demand: A greater change in price is followed by a small in change in quantity demanded then, demand is inelastic.

Types of Elasticity of Demand[Ed]:
Broadly, Elasticity of demand classified into 4 ways;

1. Price Elasticity of Demand
2. Income Elasticity of Demand
3. Cross Elasticity of Demand
4. Advertisement Elasticity of Demand.

1. PRICE ELASTICITY OF DEMAND:

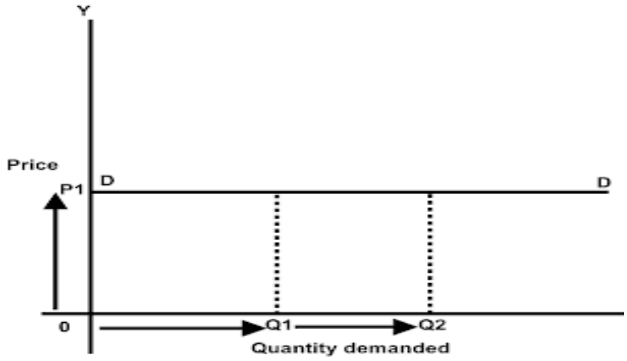
It refers to the quantity demanded of a commodity in response in a given change in price. Here the relationship between price and the demand is inverse. or -ve. It can be measured by

$$\text{Price Elasticity of Demand (PED)} = \frac{\%\triangle \text{in Qd}}{\%\triangle \text{in P}}$$

This is classified into following ways.

a) Perfectly Elastic Demand[Ed = ∞]:

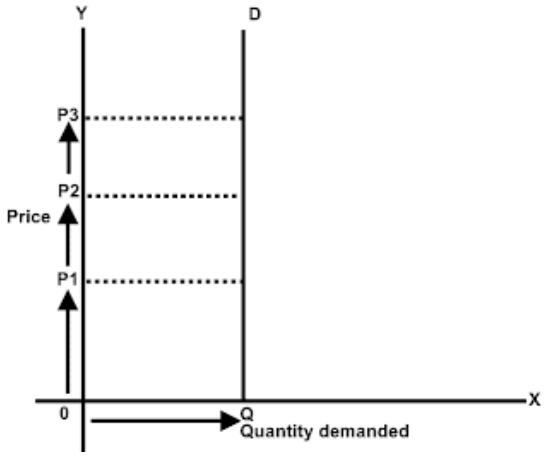
When there is no change in price leads to an infinitely large change in quantity demanded is known as perfectly or infinitely elastic demand. In this case **Ed = ∞.**



This diagram revels that quantity of demand increases for OQ_1 to OQ_2 even the price is fixed at OP_1.

b) <u>Perfectly inelastic Demand[Ed= 0]:</u>

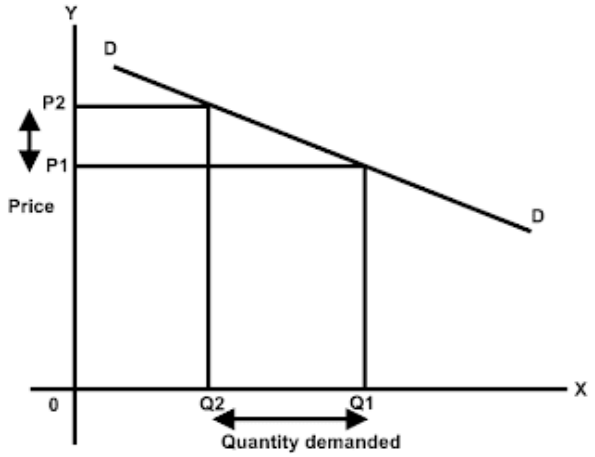
When a significant degree of change in price leads to no change in the quantity demanded. it is known as perfectly inelastic, in this case Ed= 0.



It represents that there is no change in the quantity demanded though there is no change in price. when price increases from OP1 to OP2 and OP3 the quantity demand remains constant i.e., OQ.

c) <u>Relatively Elastic Demand [Ed>1]:</u>

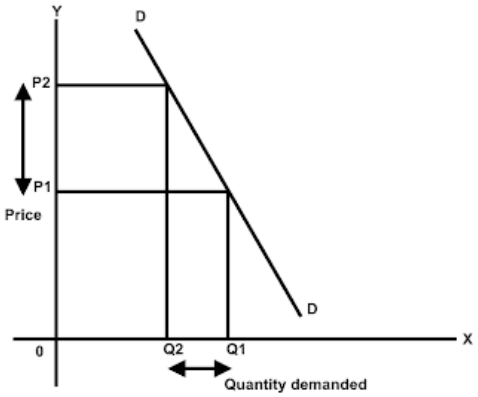
The demand is said to be relatively elastic. when the change in demand is more that the change in price. here Ed>1.



Here, a little change in price. i.e., from OP1 to OP2 caused for Greater change in demand i.e, OQ1 to OQ2.

d) <u>Relatively inelastic Demand [Ed<1]:</u>

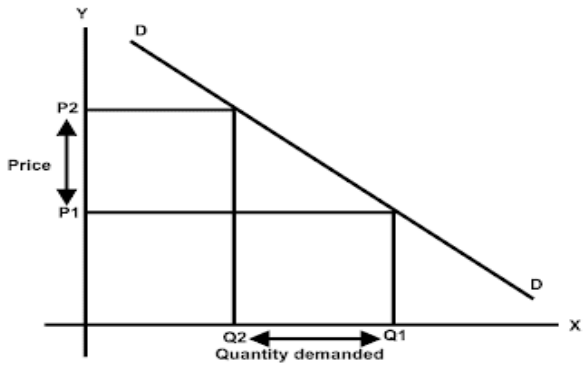
When the change in demand is less than the change in price is known as relatively inelastic demand. Here Ed <1.



Here, the price was changed at a greater extent i.e, from OP1 to OP2 resulted a small change in quantity of demanded from OQ1 to OQ2.

e) <u>Unity Elasticity of Demand [Ed =1]:</u>

The change in demand is equal to the change in Price. Here Ed =1.



Here, The change in price i.e., from OP1 to OP2 is equal to OQ1 to OQ2.

2. <u>INCOME ELASTICITY OF DEMAND:</u>

It shows the change in quantity demanded as a result of change in income.The relation between income and Demand is having +ve relationship. It can be measured by

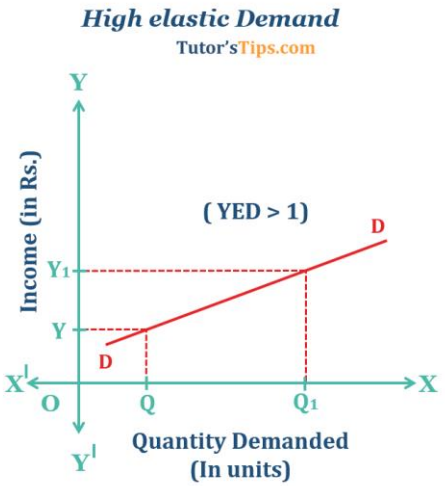
$$\text{Income Elasticity of Demand (YED)} = \frac{\%\triangle \text{in Qd}}{\%\triangle \text{in Y}}$$

Income Elasticity Of Demand (YED) refers to the ratio of the percentage of change in quantity demanded and percentage change in income level of consumer. It measures the degree of sensitivity of quantity demanded to change in income.

Types of Income Elasticity of demand:

a. Income perfectly Elasticity [or] Income Elasticity greater than unity [or] High elastic
b. Unitary elastic
c. Income Perfectly inelasticity [or] Income Elasticity lesser than unity [or] Low elastic
d. Zero elastic
e. Negative elastic

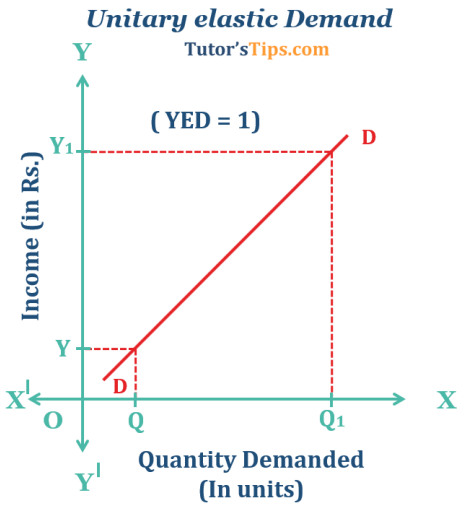
a. High Elastic:



The income elasticity of demand can be said as high if the proportionate change in quantity demanded is proportionately more than the increase in income. It can be regarded as a positive income elasticity.

For example, suppose the income of Mr A is increased by 20% and as a result, his quantity demanded is increased by 50%. In such a case, the income elasticity is high i.e. YED>1.

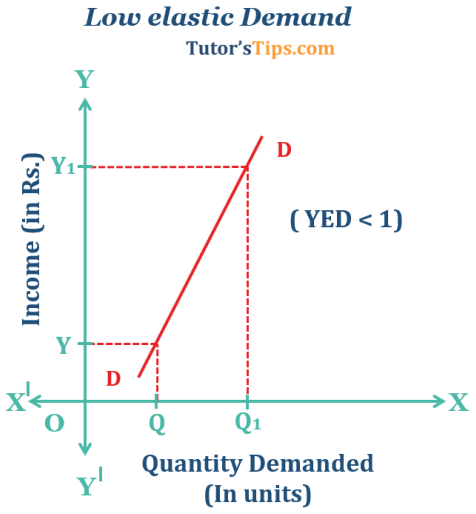
b. Unitary Elastic:



When the proportionate change in quantity demanded is equal to proportionate change in income, it can be said as unitary income elasticity of demand.

For example, suppose the income of a consumer is increased by 50% which leads to rising in quantity demanded by 50%. In such a case, the income elasticity of demand would be called unitary i.e. YED=1.

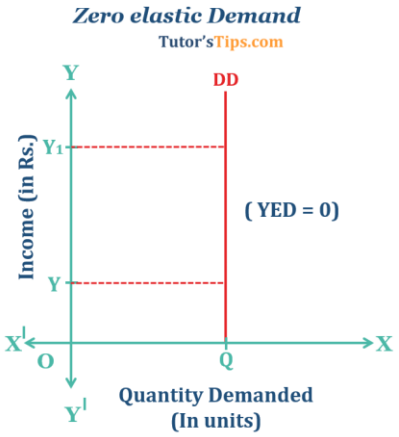
c. Low Elastic:



When the proportionate change in quantity demanded is less than the proportionate change in income, it can be regarded as low-income elasticity of demand.

For example, let us assume the income of Sumit is increased by 50% but he extended his quantity demanded by 25% only. In such a case, the income elasticity is low i.e. YED<1.

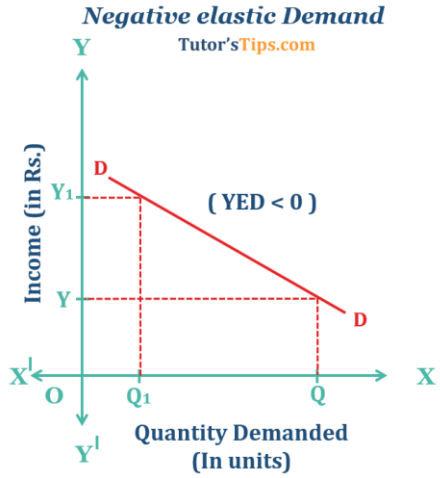
d. Zero Elastic:



It can be said as zero when there is no change in quantity demanded with respect to change in income.

For example, in the case of necessary goods, the income elasticity is zero as there is no effect of the increase in consumer's income on his consumption. i.e. YED=0.

e. Negative Elastic:



It refers to the situation where an increase in income leads to a fall in quantity demanded. The income elasticity is negative particularly for inferior goods also known as Giffen goods.

For example, if the income of a consumer is increased, he would prefer to purchase wheat instead of millet. In such a case, millet is inferior to wheat and income elasticity is negative.i.e. YED <0.

3. CROSS ELASTICITY OF DEMAND

A change in the price of one commodity leads to a change in the quantity demanded of another commodity is known as cross elasticity of demand. Cross elasticity may be positive or negative, depending on the relationship between the two commodities.

$$\text{Cross-price elasticity of demand} = \frac{\%\text{ change in quantity demanded of good 1}}{\%\text{ change in price of good 2}}$$

This can be classified into 3 types.

a) In case of Substitutable goods
b) In case of Complementary goods
c) In case of unrelated goods.

In case of Substitutable goods(Tea & Coffee):

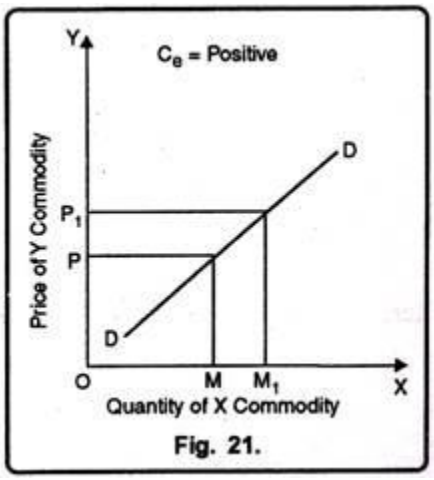


Fig. 21.

The relationship between P_X (Tea) and demand for substitute good, Y(coffee).

If X and Y are substitutes then the quantity demanded for Y is directly related to the price of X. As P_X rises to P_{X1}, demand for Y rises from OY_1 to OY_2.

In case of Complementary goods (Car & Petrol):

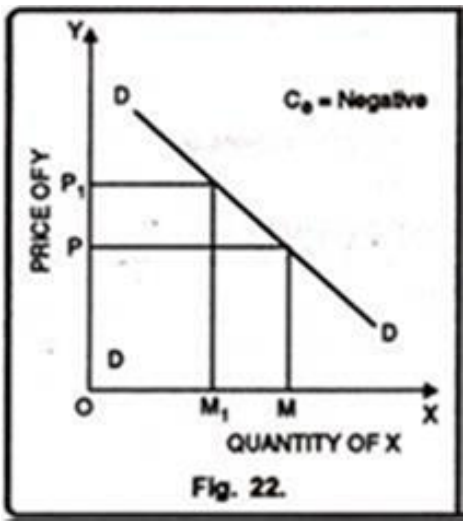


Fig. 22.

If they are complements then quantity demanded for Y(petrol) is inversely related to the price of X(car). The demand curve has a negative slope. An increase in the price of X from P_X to P_{X1} leads to a fall in the demand for Y.

Thus cross elasticity of demand has a negative value. Thus for substitute goods, cross elasticity of demand becomes positive and for complementary goods it is negative.

In case of unrelated goods:

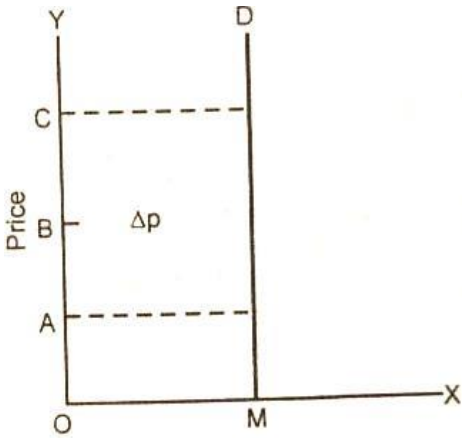


Fig. 6.2 Quantity

If goods X and Y are not related either way (say, good X is a calculator while good Y is a trouser) then the value of cross elasticity of demand becomes zero.

It shows zero cross-elasticity of demand A rise or fall in the price of X does not result in a change in the demand for Y.

4. ADVERTISEMENT ELASTICITY OF DEMAND

Advertising elasticity is a measure of an advertising campaign's effectiveness in generating new sales. It is calculated by dividing the percentage change in the quantity demanded by the percentage change in advertising expenditures. It is having the positive relation. This can be measured by

$$E_a = \frac{Proportionalte\ change\ in\ slaes}{Proportinate\ change\ in\ Advertising\ expenditure}$$

$$= \frac{S_2 - S_1}{S_2 - S_1} \div \frac{A_2 - A_1}{A_2 - A_1}$$

METHODS TO MEASURE ELASICITY OF DEMAND

Elasticity of demand can be measured by the following methods.

A] Total Outlay Method.
B] Point / Geometric Method.
C] Arc Method.

A] Total Outlay Method: This method is popularised by prof. Alfred Marshall. It shows the relationship between price of the commodity and Outlay(expenditure). This can be measured by

TQ = P x Q.

where TQ = Total Outlay
P = Price of the commodity
Q = Demand.

B] Point / Geometric Method: Under this method we can find the elasticity at different points on the same demand curve. It is based on % method and the properties of similar triangle.

$$E_p = \frac{\frac{dQ}{Q} \times 100}{\frac{dP}{P} \times 100} = \frac{dQ}{dP} \cdot \frac{P}{Q}$$

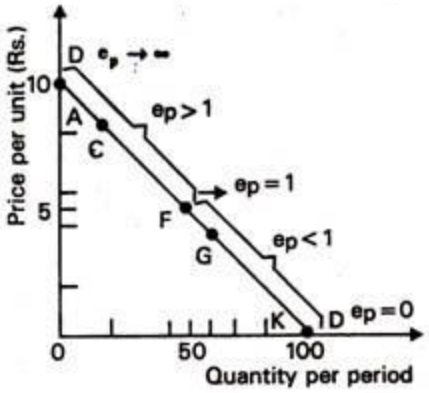


Fig. 3.13. Fall in the value of e_p

C] Arc Method: The segment or part of the curve between two lines is in a share of arc, so it is known as arc method. the measurement of elasticity of demand limits the applicability of the concept to continuous curve and demand schedule. This can be measured by

$$E_p = \frac{\frac{Q_2 - Q_1}{(Q_1+Q_2)/2}}{\frac{P_2 - P_1}{(P_1+P_2)/2}}.$$

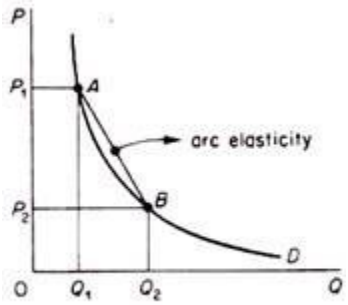


Figure 2.38

DEMAND FORECASTING

Demand forecasting refers to an estimate of future demand for the product. It is essential to firm for planning to expand the scale of their production operations.

Its main objective is assessment of the future course of demand. In recent times, forecasting plays an important role in business decision making at the right time.

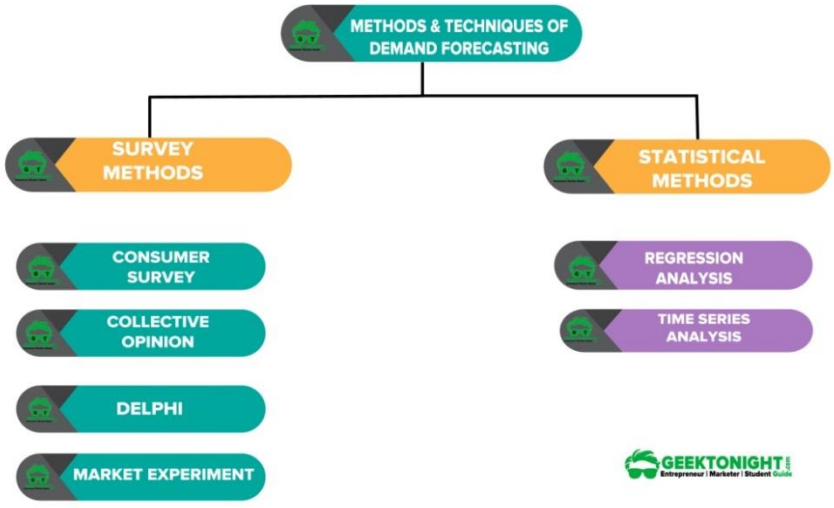
There is a difference b/w forecasting demand and sales. Demand forecasting relating to production, inventory control, timing etc. Whereas sales forecasting relates to revenue cash requirements and expenses.

As per Prof. C I Savage and T R Small demand forecasting classified into 3 levels. They are

A) Economic Level
B) Industry Level
C) Firm Level.

Economic Level forecasting is concerned with the Economics, while industrial level forecasting is used for inter industry comparisions and is being supplied by trade association or chamber of commerce. Firm level forecasting relates to individual firm.

Methods of forecasting: various methods are used for forecasting demand. Broadly they are divided into 2 ways.



1) **SURVEY METHOD**: Under this method, information about desires of the consumers and opinion of experts are collected by interviewing them. Again survey method can be divided as,

a) **Consumer (Opinion) Survey Method**:

When the demand is to be forecasted for a short period of one year than the best method is to ask the customer what they are preferring to buy. Thus, every potential customer under this method is directly interviewed. There are three ways to the survey in this method.

First, you have to start with a complete enumeration method. Here all the potential customers are asked about their future buying plans. Then it is followed by a sample survey method. In this, a sample of buyers is selected scientifically. Only these people are interviewed.

The last one is the end use method. This method is specifically used for forecasting the demand for various inputs.

b) **Collective Opinion Method**: This method is generally used by the salesman of a company. They use it successfully predict the sales of a company in the region. Thus, for predicting future sales, individual estimates are calculated. Then based on several factors like product designs, selling price, ad campaigns, etc these demands are reviewed.

c**) Delphi method**:
Under this method, a panel is selected to give suggestions for solving the problems. Both internal and external experts can be the members of the panel. Panel members one kept apart from each other and express their views in an anonymous manner. There is also a coordinator who acts as intermediary among the panelists. He prepares a questionnaires and sends it to the panelists. At the end of each round it prepares a summary report. On the basis of summary report the panel members gives suggestions. This method has been used in the area of technological forecasting.

d) **Market Expert/ Expert opinion method**: Apart from the salesmen, consumers, distributors and outside experts may also be used for the forecasting. In USA Automobile companies get sales estimates directly from their dealers. Firms in advanced countries make use of outside experts for estimating future demand.

2) STATISTICAL METHODS: It is used for long run forecasting. Under this method, statistical and mathematical techniques are used to forecast demand. This methods depends or relies on past data. This also be classified as,

a) **Regression Analysis Method**: The demand function for a product is estimated where demand is dependent variable and variables that determine the demand are independent variable.

If only one variable affects the demand, then it is called single variable demand function. Thus, simple regression techniques are used.

Simple regression is the relationship between two variables where one is independent variable and the other is dependent variable.

The equation to calculate simple regression is as follows:

$Y = a + bx$

Where, y = estimated value of y for a given value of x

B = amount of change in y produced by a unit change in x

A and b = constants

b**) Time Series / Trend Projection Methods**:

Trend projection or least square method is the classical method of business forecasting. In this method, a large amount of reliable data is required for forecasting demand. In addition, this method assumes that the factors, such as sales and demand, responsible for past trends would remain the same in future.

In this method, sales forecasts are made through analysis of past data taken from previous year's books of accounts. In case of new organizations, sales data is taken from organizations already existing in the same industry. This method uses time-series data on sales for forecasting the demand of a product.

c) **Barometric Method**:

In barometric method, demand is predicted on the basis of past events or key variables occurring in the present. This method is also used to predict various economic indicators, such as saving, investment, and income. This method was introduced by Harvard Economic Service in 1920 and further revised by National Bureau of Economic Research (NBER) in 1930s.

This technique helps in determining the general trend of business activities. For example, suppose government allots land to the XYZ society for constructing buildings. This indicates that there would be high demand for cement, bricks, and steel.

The main advantage of this method is that it is applicable even in the absence of past data. However, this method is not applicable in case of new products. In addition, it loses its applicability when there is no time lag between economic indicator and demand.

SUPPLY

In Economics, supply refers to the amount of that producer and firms are willing to sell at a given price when all other factors being held constant.

In other words of Meyer, "Supply is a schedule of the amount of good that would be offered for sale at all possible prices at any period of time e.g, a day, a week or a month and so on".

Individual supply: it refers to quantity of a commodity that an individual firm is willing and able to offer for a sale for a given price during a given period of time.

Market Supply: it refers to the quantity of a commodity that all the firms are willing and able to offer for a sale at a given price during a given period of time.

Supply Schedule

Supply schedule is a table showing the relationship between price and quantity supply of commodity.

Price of Coke	Quantity Supply of coke
5	2
10	4
15	6

Positive relationship between price and demand

Price ↑ Qs ↑

Price ↓ Qs ↓

Supply Curve

Supply curve is the graphical representation of the supply schedule; it shows how much of a good or service producer want to sell at any given price.