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* Economics

- It is a social science. Its basic function is to study how people, individuals, firms, households, and nations maximize their gains from their limited resources and opportunities.
- It is derived from ancient greek word "oikonomia" which means how to hold management.
- It means that economics is concerned with the management of wants by households.
- However as a result of writings of many economists the focus has now shifted from management of wants to the management of resources.
- Broadly speaking, the various definitions of economics can be categorised into three heads:
 - (i) Economics as a study of wealth
 - (ii) Economics as a study of welfare
 - (iii) Economics as a study of problem arising out of scarcity of resources

* Economics as a science of wealth

- Adam Smith defined economics in his book entitled "an enquiry into the nature and causes of the generation of wealth of a nation".
- Goods have both value in use and value in exchange.
- Adam Smith defined wealth as all those goods which command value in exchange.

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- Economics according to Adam Smith seeks to explain and analyze the generation of wealth and also its distribution.
- He argued that the larger amount of wealth & the betterment of whole society could be achieved by an efficient allocation of resources through the market mechanism.
- But this definition has been criticised on the following grounds-
1. Adam Smith laid all emphasis on wealth but ignored man and his welfare.
 2. He gave restricted meaning of wealth as he included in wealth only material goods like tea, biscuits, butter and excluded non-material goods that is services like those of doctor, soldier etc.
 3. This definition makes the earning of wealth an end in itself.
- * Economics as a science of material welfare
- Acc. to Marshall, Economics is the study of man's actions in the ordinary course of life. It enquires how he gets his income and how he spends it.
- Acc. to Marshall, the definition of economics can be expressed as follows-
- (i) Economics is the study of man.
 - (ii) Economics is concerned only with those activities of man which are related to the social
- acquisitions and enjoyment of wealth:
2. Robbins criticised Marshall's definition on the following grounds-
- (i) Marshall's view of economics is narrow and unscientific.
 - (ii) Material welfare which cannot be measured by any scale cannot be accepted as end of economics.
 - (iii) Economics is not a social science but a human science. It has its own universal applicable laws.
- * Economics as a science of allocation of scarce resource
1. Acc. to Robbins, Economics is the science which studies human behaviour as a relationship b/w ends scarce means which have alternative uses.
2. This analytical definition has three fundamental basis -
- (i) Ends
 - (ii) Means
 - (iii) Alternative uses
- It refers to wants. Human beings have wants which are unlimited in no.
- Although wants are unlimited yet the means to satisfy them are strictly limited.
- If a commodity is to be put only to one use and to none else few economic problems would arise in its connection. After it has met that use it will become a free good and will have no further economic significance.

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Innovation
Business
Marketing
Organisational
Product
Process

Invention
Product
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Robbins' definition has also been criticised on the following grounds-

- (i) Robbins' definition excludes the concept of purpose which is fundamental to human actions.
- Actually the ends are seldom presented consistently with the means.
- (ii) Knight has criticised the attitude that economics is only concerned with means and not ends. Economics should discuss the alternative ends and not only means for a given end.
- (iii) The theory of economic growth has now become a very imp. branch of economics. But Robbins' definitions does not cover it.

* Nature of Economics

By discussing the nature of economics, we consider the following matter of economic

- (i) whether economics is a science or an art
- (ii) whether it is a true science or normative science.
- (iii) whether it is a social science.
- (iv) whether it can solve practical problems.

(i) The subject matter of economics

→ Micro & Macro economics play a significant role in economics.

(ii) Whether economics is a science or art.

→ Economics is not only a science but also an art. It is a science in its methodology. Economics can claim a no. of imp. discoveries that have improved our understanding and our economic performance.

→ It is an art in its application.

→ (iii) Whether it is a true science or normative science

A positive science only explains "what is" and normative science tells us "what ought to be" that is right or wrong of a thing. In other words positive science describes while the normative science evaluates.

When we say for ex - the business men while making decisions we profit maximisation as the criteria. It is a true economics when he asked ought we use this criterion we enter the field of normative economics. It should be considered whether economics can pass moral judgements and simply explain "why" of things.

(iv) Whether it is a social science

In order to understand the social aspect of economics we should bear in mind that the workers and working in factories on materials drawn from all over the world

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and producing commodities to be sold all over the world in order to get in exchange goods from all other parts of the world to satisfy their wants. There is thus close ~~relation~~
interdependence of millions of people living in distant land utterly unknown to one another. In this way the process of satisfying wants is a social process not an individual process. Economics thus has to study social behaviour that is behaviour of man in the group.

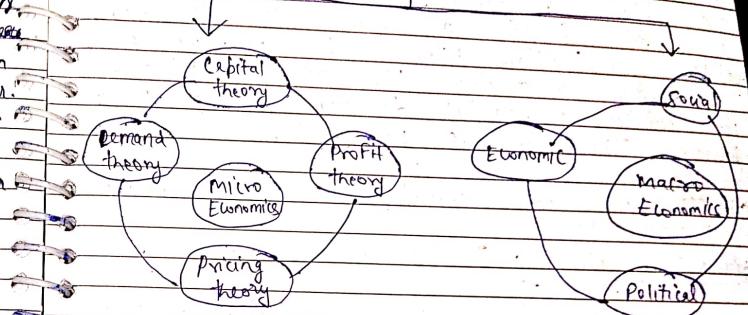
(v) Whether it can solve practical problems

Everyday the economists are being called upon to give advise on practical problems. Economics is chiefly valuable neither as an intellectual gymnastics nor as a means of winning truth for its own sake but as the source of ethics and a servant of practice.

* Managerial Economics

The subject that uses the theories of economics and the methodologies of the decision science for managerial decision making is known as managerial economics.

* Scope of Managerial Economics



* Nature of Managerial Economics

- It is defined by the factors such as
- (i) Is essentially micro economic in nature
- Micro-economic is a branch of economics that deals with individual units of an economy. These individual units may be either a person or a firm or a group of persons or a firm. Since managerial economics is concerned with analysis and finding optimal solutions to decision making problems of business or firms. It is essentially microeconomic in nature.
- (ii) It is pragmatic
- Managerial economics is a practical subject. It goes beyond providing rigid and abstract

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pragmatic means practical

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Theoretical framework for managers. While at some places it avoids difficult abstract issues of economic theories at some other it incorporates complications ignored by economic theory. In order to analyse the overall situation in which managerial decision making takes place. Thus it is pragmatic.

(iii) It belongs to normative economics besides

being descriptive. It is also prescriptive.

Economics can be classified as one or normative. Positive economics describes what is observed economic phenomenon. Normative economics on the other hand distinguishes idea from actual.

(iv) Is conceptual in nature

It aims to analyse business problems on the basis of established concepts. Utilizes some theory of macroeconomics.

(v) Utilizes some theory of macroeconomics when all individual matters are added up and it becomes the matter of analyzing the problems of economy or nation as a whole. Managerial economics does not prescribe solution to the business problems in isolation. In order to arrive at logical outcomes it takes the help of some macroeconomic theories.

To understand the environment in which firm operate.

(i) Is problem solving in nature

Besides analysing the managerial problems of business units ME aims at finding out small solutions to the business problems of the firm.

* Describe the major areas of business decision making?

Business decision making has 4 phases-

(i) Determining and defining the objective to be achieved

(ii) Collection and analysis of business related data and other info. regarding economic, social, political and technological environment.

(iii) Inventing, developing and analyzing possible courses of action.

(iv) Selecting a particular course of action from the available alternatives.

Economic theories to the problems of business facilitate decision making in atleast three ways

(i) It gives a clear understanding of various economic concepts used in business analysis.

For ex- the concept of cost includes total, average; marginal, fixed, variable, actual

and opportunity. Economic clarifies which cost concept are relevant and in what context.

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- (ii) ET helps in deciding the relevant variables and specifying the relevant data.
 - (iii) Economic theory states the general relationship b/w two or more economic variables and also events.

Application of relevant economic theory provides consistency to business analysts and helps in arriving at right conclusions.

Managerial Decision Areas

1. Assessment of Investible funds
2. Selecting Business Area
3. Choice of Product
4. Determining optimum opp
5. Determining Price of the product
6. Determining TIP combination & Technology
7. Sales Promotion

Application of Economic Concepts & Theories in Decision Making

Use of quantitative methods

1. Mathematical Tools
2. Statistical Tools
3. Econometrics

Managerial Economics

Application of economic concepts, theories & analytical tools to find optimum solution to business problems

Application of Economics to Managerial Decision Making

X Analysis of Consumer Demand

Demand is the mother of production. For ex- increase in demand for computers in India has enlarged business prospects for companies selling computers. On the other hand, defining demand for black-white TVs is forcing their companies to go out of business. Therefore it is essential for business manager to have a clear understanding of the following aspects of demand for their products.

- What is the basis of demand for a commodity?
- What are the determinants of demand?
- How do the buyers decide the quantity of a product to be purchased?
- How do the buyers respond to the change in product prices, their income and prices of related goods?
- How can the total or market demand for a product be forecasted?

X Meaning of Demand

- Attributes of Demand
- 1. Desire to pay
- 2. Willingness to pay
- 3. Ability to pay

And Utility → Basis of consumer Demand

Utility

C →

C - angle

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product \Leftrightarrow want satisfying property
of a commodity

consumer \Leftrightarrow psychological feeling of
satisfaction, pleasure, happiness.

* Two approaches to consumer demand analysis

1. Cardinal utility Approach

- It is attributed to Alfred Marshall and his followers, and is also called new classical approach.
- This approach says utility is measurable and quantifiable. The unit for utility is util.

2. Ordinal utility Approach

- It is pioneered by J.R. Hicks and R.G.D. Allen, and is also called indifference curve analysis.
- This treats utility as something which can only be compared but not quantified.

* Total utility

Assuming that utility is measurable and additive, total utility may be defined as sum of the utility derived by a consumer from various units of a service or goods. He consumes at a point or over a period of time.

$$U = U_1 + U_2 + U_3 + \dots + U_n$$

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* Marginal Utility

It refers to the change in total utility obtained from consumption of one additional unit or utility derived from one additional unit.

$$MU_x = \frac{\Delta TU_x}{\Delta Q_x}$$

$$MU = TU_n - TU_{n-1}$$

Q	Utils	TU	MU
1	10	10	-
2	9	19	9:
3	8	27	8

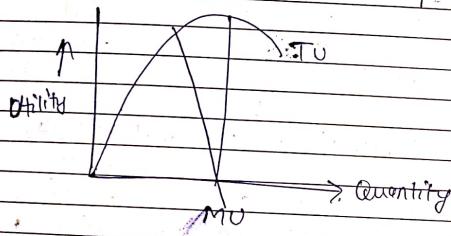
* Law of Diminishing Marginal Utility

This law states that as the quantity consumed of a commodity goes on increasing the utility derived from each successive unit goes on diminishing.

In simple words, when a person consumes more and more units of a commodity per unit of time - for ex - ice cream. Hoping the consumption of all other commodities constant the utility which he derives from each successive unit goes on diminishing.

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units of commodity	Total Utility (TU)	Date.....
1	30	Marginal Utility (MU)
2	50	30
3	60	20
4	65	10
5	60	5
6	45	-5



* Assumptions of cardinal utility analysis

- Utility is cardinal.
- Utility being quantifiable is additive.
- Various units of a commodity consume are homogeneous. For ex- if 200 ml of softdrink is consumed then all bottles of 200 ml should consume.

- There is no time gap b/w consumption of successive units i.e. without any break.
- The consumer is rational i.e. he has perfect knowledge and maximizes utility.

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- Consumer's income is limited and constant.
- The taste and preferences of the consumer remain unchanged.
- The marginal utility of money is constant.

* Consumer Equilibrium

- A consumer reaches its equilibrium position when he has maximized the level of his satisfaction given his resources and other conditions.
- A consumer is said to be in equilibrium when he has first maximized his satisfaction.
- Spent his entire income.
- Attained optimum allocation of expenditure.
- Consumed optimum quantity of each commodity.

* Law of Equimarginal Utility

- A consumer spends his entire income on various good he consumes in such a manner that each rupee spent on each good yields the same marginal utility. Technically this law states that a consumer consumes various goods in such quantities that the marginal utility derived per unit of expenditure from each good is the same.

$$\frac{MU_1}{P_1} = \frac{MU_2}{P_2} = \frac{MU_3}{P_3} = \dots = \frac{MU_n}{P_n}$$

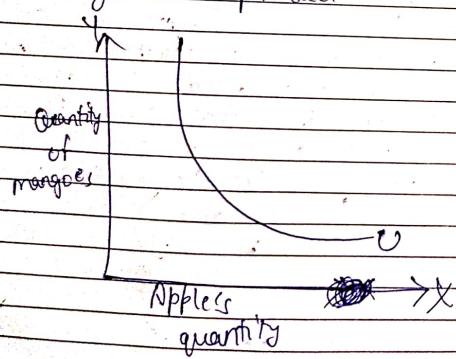
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* Analysis of Consumer Behaviour and ordinal Utility approach

A theory of consumer demand was put forward by J.R Hicks and R.G.D. Allen. This approach considers utility to be ordinal i.e. it cannot be measured but can only be ranked or compared. This is also called Indifference curve analysis.

* Indifference curve

The locus of points each representing a different combination of two goods which provide the same level of utility for the consumer is known as Indifference curve. The curve derive its name from the fact that consumer is indifferent to any of these combinations when it comes to making a choice b/w them. He is not biased for any of the product.



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Combination	Apple (X)	Mango (Y)	Total Utility, TU	MRS = $\frac{\text{TU}_1 - \text{TU}_2}{\text{X}_1 - \text{X}_2}$
P	1	30	U	-
B	2	24	U	-6
C	3	19	U	-5
D	4	15	U	-4
E	5	12	U	-3
F	6	10	U	-2
G	7	9	U	-1

- Indifference curve slope downwards from left to right b/c for some level of utility if demand of one commodity increases, the demand of second commodity decrease.

- Indifference curve has -ve slope i.e. increase in the amount of one commodity is accompanied by reduction in other.

- Indifference curve are convex to the origin. This is b/c two goods cannot be perfect substitutes for each other as a consumer gets larger quantities of one commodity n at the cost of another commodity y . The marginal utility of n decreases due to reduced availability of y , the marginal utility of y increases. Thus the consumer will be ready to sacrifice lesser quantity of y for each additional quantity of n .

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* Indifference curve never intersect each other

1- since the same combination of goods cannot yield two different level of utility, indifference curve can never cut each other.

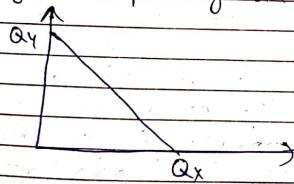
2- Higher indifference curve denotes higher level of utility

Higher utility can be only when the quantity demand either one or both the goods is increased. This would mean a higher indifference curve.

* Budget line

A budget line represents all the combination of 2 products that can be purchased for a given amount of money.

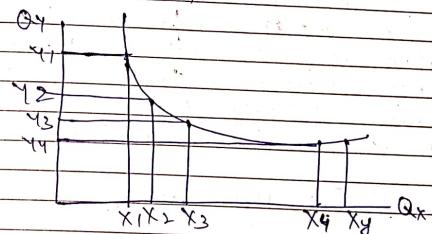
Total budget = spending on X + spending on Y



* Marginal rate of substitution

The rate at which one com. can be substituted for another if the total utility remains unchanged.

$$MRS = \frac{\Delta Y}{\Delta X}$$



* Law of diminishing Marginal Rate of Substitution

The quantity of a commodity that a consumer is willing to sacrifice for an additional unit keeps on decreasing as he continues substituting one commodity for another. For eg. If I am increasing quantity of apple then first time for 1 apple I am sacrificing 6 mangoes then for 2 apple I am sacrificing 5 mangoes and so on. Then the focus of attraction will change to the thing I am sacrificing.

* Characteristics of ME

ME is the application of economic concepts and economic analysis to the problems of formulating rational managerial decisions.

Characteristics are as follows:

1. Cost analysis: Estimation of cost is an essential part of managerial problems. The factory causing variation of cost must be found out and allow for management to arrive at cost estimates. This will help for more effective planning and its sound pricing practices.

2. Pricing decisions: The firms aim to profit

which depends upon correctness of pricing decision. The pricing is an important area of managerial economics theories regarding price fixation helps the firm to solve the price fixation problems.

3. Profit analysis: Business firms working for profit and it is an imp. measure of success but firms working under conditions of uncertainty. Profit planning become necessary under the conditions of uncertainty.

4. Capital budgeting: The business managers have to take very imp. business decisions relating to the firm's capital investment. The manager has to calculate correctly the profitability of investment and properly allocate the

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the capital.

5. Production and supply analysis:

Production analysis is narrow in scope than cost analysis; production analysis proceeds in physical while cost analysis proceeds in monetary terms. Imp. aspects of supply analysis are

1. Supply schedule

2. Curves & function

3. Law of Supply

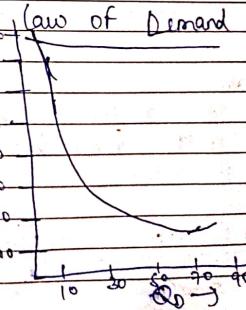
4. Factors influencing supply

* Law of Demand

The law of demand can be stated as quantity demanded of a commodity increases when its price decreases and when its price increases, quantity demanded decreases all other things remaining constant. This is called Ceteris paribus.

Demand schedule

Price	Qn
800	8
600	15
400	30
300	40
200	55
100	80



The law of Demand states the nature of relationship b/w the quantity demanded of the product and the price of the product. Although quantity demanded of a commodity depends on many factors. For ex - consumer income, price of substitute complementary goods, consumer taste and preferences, advertisement etc. The price is the most imp and the only determinant of demand in the short run. This law implies demand and price are inversely related.

* Why demand curve slope downwards?

- Demand curve slope downwards to the right. It has -ve slope. It shows inverse relationship b/w the price of the product and their quantity demanded. But the question arises as to why the more quantity is demanded at a lower price. The factor responsible for downward slope of demand curve are as follows:

(ii) Law of Diminishing Marginal Utility

Consumer is ready to pay high price for initial units as he derives more satisfaction from them. Further the satisfaction that he gets from successive units diminishes so he pays less for successive units.

(iii) Substitution effect

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4- Changes in the no. of consumers
Many people cannot afford to buy a commodity at higher price. When the price falls a no. of persons who could not afford at a higher price can purchase it at reduced price.

* Exception to the law of demand

- There are certain cases where law of demand doesn't hold good. These are -

1- Giffen Goods

Giffen goods are inferior goods consumed mostly by poor people. For ex - Bajra. The demand for such goods increases with an increase in their price and decreases with decrease in the price. The reason is when price of an inferior good increases income remaining the same poor people cut the consumption of the superior good so that they are able to buy sufficient quantity of the inferior good to meet their basic need.

Suppose a poor man has total income of Rs 200 and needs atleast 30 kg of foodgrain to survive. Let the price of bajra and wheat be Rs 5. and Rs 10 per kg. Bajra is an inferior while wheat is superior. The consumer consumes 20 kg and 10 kg of bajra and wheat respectively.

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	Bajra	wheat	Total	Date.....
Quantity	20	10	30	
Price	5	10	15	
Amount	100	100	= 200	

Now let the price of bajra increases to Re 6 per kg the household will be forced to reduce the consumption of wheat by 5 kg and increases the consumption of bajra by the same quantity in order to meet its minimum requirement of 30 kg of food grains.

2. Luxurious goods

If demand increases with an increase in the price and vice-versa. The higher the price, the greater the utility to the consumer. It is due to the fact that rich people attach a lot of value to luxurious goods that distinguish them from the common man. These goods have prestige value for upper strata of society.

Whenever the price of such goods rises their prestige value increases and hence the demand for them goes up. For ex - diamond, luxurious cars etc.

3. Speculative Goods

- Speculative goods such as share do not follow the law of demand for these goods whenever the price rises the traders of such goods expect the prices to rise further so they buy more such goods in the hope of selling them later at a higher price. The same applies to the traders selling speculative goods when their price falls out of the fear of further price fall. Traders, shares, and stocks.

4. Outdated goods

Goods that go out of fashion or out of advanced technology are outdated with the bunch of latest fashion and technology. Even at the high price people prefer purchasing these goods rather than outdated goods which may be available at lower price.

* Demand classification

1. Autonomous Demand and Derived Demand

- Demand which is not tied with the demand for other goods. All direct demands may be called autonomous demand. For ex - demand for milk and vegetable.

- Demand for a product which is tied to the purchase of some parent product its demand is called derived demand. For ex raw material cement, tyres is derived since its demand

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~~gross~~ depend upon demand of vehicles.

2. Durable and Non-durable goods

Durable goods are those that can be used more than once over a period of time. For ex - cars, tools, etc.

Non-Durable goods are those that can be used only once. For ex - coal, oil, bread etc.

3. Firm & Industry Demand

Demand for the product of a particular firm is known as Firm Demand; on the other hand demand for the product of a particular industry is known as Industry Demand.

4. Total market & market segment demand

Markets are segmented on the basis of age, income, geographical region etc. Demand for certain products can be studied not only in totality. But also breaking it into different segments. For ex - sweet or dessert demand

Indian sweets

old aged

children

middle aged

Total market

Segment

Ice cream

old aged

Chocolate / cakes

middle aged

5. Short run and long run demand

Short run demand refers to the existing demand and long run demand refers to the demand for a product in a large span of time.

X Determinants of Demands

Demand function is multivariate that is dependent on various variables. Some important determinants of demands are as follows:-

(i) Consumer income
(ii) Price of product
(iii) Price of related goods that is substitute & complement

(iv) Taste and preferences of the consumer
(v) Advertisements of the product

(vi) Consumer expectation about future price and supply condition of the product
(vii) Credit facilities and discount by the seller

(viii) Population of the country.
(ix) Distribution pattern of national income
(x) Multiplicity of the uses of the goods

The demand function may be expressed symbolically as $Q = F(P, P_r, Y, T, E, D)$

Where $P \rightarrow$ Price of Product

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P_x = Price of related goods

Y = Income

T = Taste & preference

E = Expectations about future

O = others

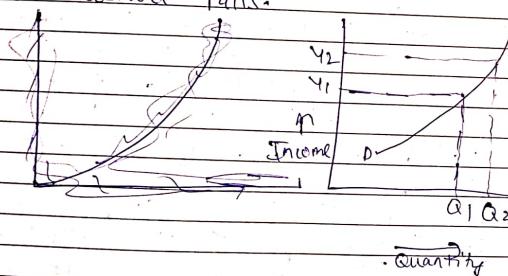
I. Income of the consumer

- With a increase in income the purchasing power increases and hence consumer affordability increases.

- The income has different effects on goods with different types.

(i) Normal goods

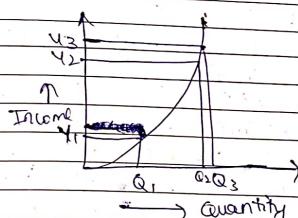
Income has positive effect on normal goods i.e. when income goes up demand increases and when income falls demand falls.



(ii) Inferior goods

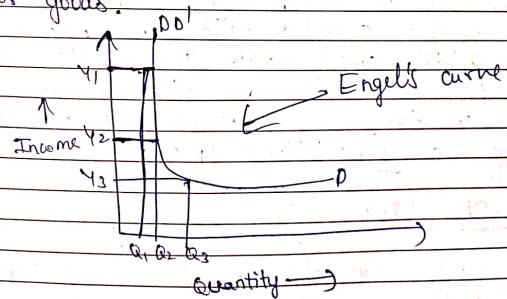
The goods and services in this services are called basic needs. They are consumed by all persons of a society. For ex food grain, salt, vegetable etc.

Quantity demanded of this category of goods increases with increase in consumer's income but upto a certain limit and saturates after that limit.



(iii) Inferior goods

It is also possible that rise in income of the consumer may lead to a fall in quantity demanded such goods are called inferior goods. Income effect is -ve. For ex- bajra. This is bcz when income rises consumer shift to superior goods.



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2. Price of product

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The Price of the product is one of the important determinant of its demand in the long run and the only determinant in the short run. The price of the product and its quantity demanded are inversely related. The law of demand states that quantity demanded of a product which its consumer would like to buy per unit of time increases when its price falls and decreases when its price increases other factors remaining constant.

$$\text{Price effect} = \text{Substitution effect} + \text{Income effect}$$

Substitution effect

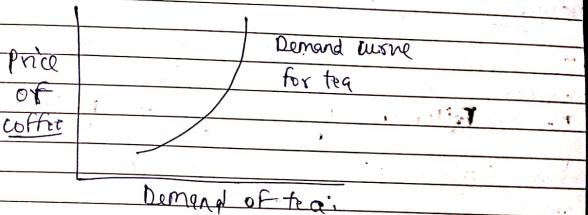
When the price of the commodity falls, price of its substitutes remaining constant then the substitute become relatively cheaper or in other words the commodity whose price has fallen becomes relatively cheaper since a utility maximizing consumer substitutes cheaper goods for costlier ones. Demand for the cheaper commodity increases the increase in demand on account of this factor is known as substitution effect.

3. Price of related goods

Related goods can be substitute or complementary goods.

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Two commodities are called substitutes when they satisfy same needs or want. For ex tea and coffee. By definition the relation b/w demand for a product and price of its substitute is of the nature i.e. increase in the price of coffee causes increase in the demand for tea or substitute but consumer shifts to a substitute when price of a product increases.



Demand of tea:

(iii) Complement

- A commodity is called a complement for another when its complement the use of other or when the use of two goods goes together so that their demand changes simultaneously for ex- butter and bread, petrol and car. By definition there is an inverse relationship b/w the demand for a good and the price of its complement that is increase in the price of one causes decrease in the demand for other. For ex increase in the price of butter will decrease in the demand for butter.

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price
of
butter

Demand curve
for bread

Demand for bread

Taste and preference

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It depends on lifestyle, social custom, religious values, living standards, habit, age etc.
For ex. Following the change in fashion people switch their consumption pattern from old fashion ones modern goods. This piece of info. is useful for managers in two ways-

- (i) They can make quick profits by designing new models of their product.
- (ii) They can plan production better and can avoid over production if they keep an eye on the changing fashion.

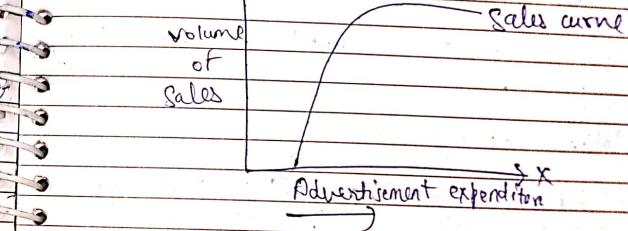
5. Advertisement Expenditure

Advertisement are incurred with the objective of promoting sales of the product. Advertisement helps in increasing the demand for the product in at least four ways-

- (i) By informing the consumer about availability of the product.

- (ii) By showing superiority own rival's products.
- (iii) By influencing consumer's choice against the rival product.
- (iv) By setting new fashion and changing taste.

The impact of such effects shifts the demand upward to the right that is increase in advertisement increases the volume of sales.



6. Consumer's expectations

- Consumer's expectations regarding future price income and supply position of the goods etc. play an imp. role in determining demand for goods and services in the short run. If consumers expect a high rise in the price of a com-
modity they would buy more of it at its high current prices with a view to avoid the pinch of high rise in the future. On the contrary if the consumer expects a fall in the price of certain goods they postpone their purchase of such goods with

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a view of taking advantage of lower price
in the future.

7. Credit facility and discount by the seller

Availability of credit to the consumer from the sellers bank relations and friends encourages the consumer's to buy more than what they would buy in the absence of credit availability.

Credit facility mostly affect the demand of durable goods.

8. Population of the country

The total domestic demand for a product of mass consumption also on the size of population with an increase or decrease in the size of the population and with employment becoming remaining the same. Demand for a product increases or decreases.

9. Distribution of national income

Distribution pattern of national income is also an imp determinant of the overall demand for a product. If national income is unevenly distributed i.e. if major of population belongs to lower income groups. Then the demand for essential goods will be larger than luxury goods.

10. Multiplicity of the uses of goods

If a product can be used for multiple purpose then the demand for such products will be higher than those who solve only one or two purpose.

* Elasticity of Demand

Demand of a product has its relationship with the determinant which has been seen into the demand function with the change in these determinants value. The demand will also vary. Hence it is imp to know how much demand changes in response to various factors.

* Concept of Elasticity

The percentage change in dependent variable resulting from one person to change in an independent variable is known as elasticity. In other words elasticity is measure of responsiveness of a dependent variable to a given change in an independent variable.

Elasticity of Y = $\frac{\% \text{age change in } Y}{\% \text{age change in } X}$

Elasticity can be measured in two ways
(i) Point elasticity

It is used when the change in independent

variable is small. It measures responsiveness of one variable to the change in another at a given point on a function.

$$\text{Point elasticity} = \frac{\Delta y / y}{\Delta x / x} = \frac{\Delta y \cdot x}{\Delta x \cdot y}$$

(ii) Arc elasticity

It is used when the change in independent variable is large. It computes elasticity over a given range function.

$$\text{Arc elasticity} = \frac{\Delta y / (y_1 + y_2)/2}{\Delta x / (x_1 + x_2)/2} = \frac{\Delta y (x_1 + x_2)}{\Delta x (y_1 + y_2)}$$

* Elasticity of Demand in managerial decision making

Elasticity of Demand as ratio of %age change in the demand to the %age change in one of the determinants of demand.

$$e_D = \frac{\text{Percentage change in Demand}}{\text{Percentage change in determinant of demand}}$$

Elasticity is the measure of responsiveness of demand to the changes in the variable on which it depends.

Demand elasticity shows how sensitive demand is to a change in the underlying factor in

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the demand function.

* Important elasticities of demand

1. Income elasticity of demand

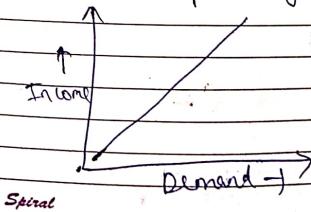
Income elasticity of demand is the measure of %age change in the demand for a commodity due to 1% change in the consumer's income where all other things remaining constant.

$$e_I = \frac{\text{Percentage change in Demand}}{\text{Percentage change in Income}} = \frac{\Delta D_I / D_I}{\Delta I / I}$$

It shows the responsiveness of demand for a particular commodity to the variation in the consumer's income. Income elasticity can be

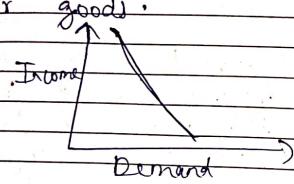
(i) Positive

When demand has a direct relationship with consumer income i.e., with increase in consumer income. For ex - superior goods or normal goods.



2. Negative

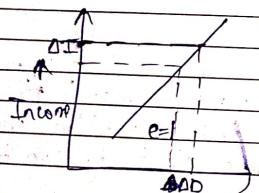
When demand has inverse relationship with consumer's income i.e. demand decreases with increase in consumer income. For ex - inferior goods.



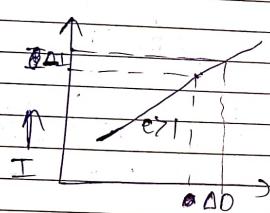
Further positive income elasticity of demand can be

$$(i) e=1$$

$$(ii) e>1$$

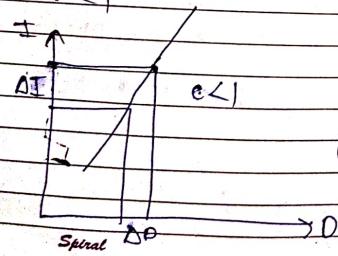


(AI is proportionate with ΔD)



(ΔD is more than ΔI)

$$(iii) e<1$$



(ΔI is more than ΔD)

X1. Price Elasticity of Demand

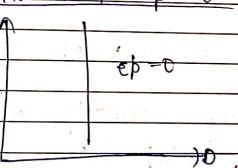
It measures the responsiveness of a demand for a product to the change in the price of the product while all things remaining constant.

$$e_p = \frac{\% \text{age change in demand}}{\% \text{age change in price}}$$

$$= \frac{\Delta D_p / D_p}{\Delta P_p / P_p}$$

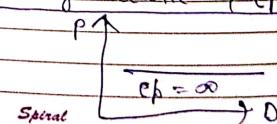
Price elasticity of demand is -ve for all normal goods. This is b/c of the fact that demand for a product varies inversely with its price.

(i) Perfectly inelastic, $e_p=0$.



The price elasticity of demand for cheap goods that are generally consumed in fixed quantities is zero. There is no decrease in the quantity demanded when price is increased and vice-versa. For ex - salt.

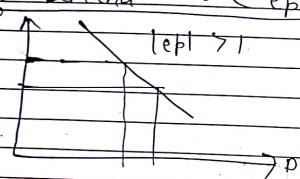
(ii) Perfectly elastic, $e_p = -\infty$ or $le_p = \infty$



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It's a rare case it implies that a given price a consumer can buy any quantity of commodity and seller can sell any quantity of commodity. A seller cannot charge higher or lower price.

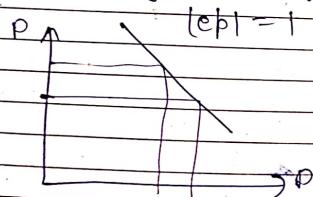
(iii) Elastic Demand $-\infty < |e_p| < -1$; $|e_p| > 1$



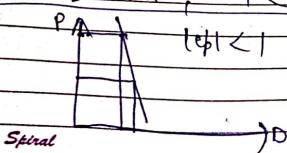
When a given change in the price induces large change in the demand - for ex- luxury goods and fashion items like cosmetics.

(iv) Unit elastic Demand; $e_p = -1$; $|e_p| = 1$

Here demand changes exactly equal to the change in price



(v) Inelastic Demand; $-1 < e_p < 0$; $|e_p| < 1$



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Here a given change in the price induces lesser effect on the demand. Increase in the price of such goods does not substantially affect consumer's budget. Therefore people continue to purchase almost the same quantity even when their prices increases. For ex - necessities goods like milk, bread, wheat, tooth-paste etc.

(vi) Cross elasticity of Demand

Sometimes price of related product causes a variation in the demand for a commodity. Cross elasticity of demand measures the responsiveness of demand for one product to the change in the price of another.

$$e_c = \frac{\% \text{ age change in demand of } X}{\% \text{ age change in price of } Y}$$

$$= \frac{\Delta D_n / D_n}{\Delta P_y / P_y}$$

(vii) Substitute

The cross elasticity is two for substitute i.e. with an increase in price of product causing the rise in the demand of related product. For ex - when price of tea rises people replace tea with coffee hence demand for coffee goes up.

Spiral

Unit-2

Demand FOREcasting

It is the ~~forecasting~~ prediction of future demand for firm products. Most business decisions are made under risk and uncertainty.

The knowledge about the future demand of the product help in following business decision making.

- (i) Planning and scheduling production
- (ii) Acquiring input like raw material, labour, capital etc.
- (iii) Making provision for finances.
- (iv) Formulating pricing strategy.
- (v) Planning, advertisement etc.

* Characteristic of good demand forecasting methods

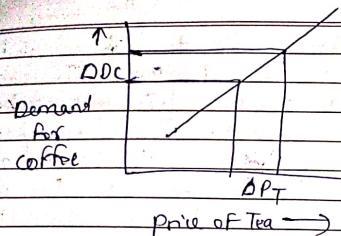
1- Time ~~span~~ horizon

The length of the time over which a decision is being made has a bearing on the appropriate technique to use. Generally qualitative forecasting techniques are better suited for forecasting longer periods into the future. On the other hand quantitative techniques are more accurate in the short run such as within a year or less.

2- Level of Detail

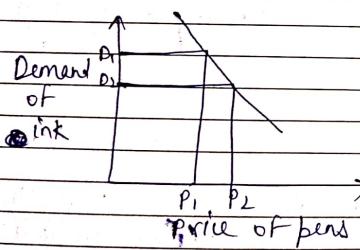
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(iii) complements

Cross elasticity of demand is -ve for complements i.e. rise in the price of the product causes decrease in the demand of its related product. For ex- if the price of pen increases people will buy less pens hence less ink will be required so ultimately demand of ink will also fall.



The level of detail needed should match the focus of the decision making unit in the forecast. For ex - production planning must make its decision at the individual product level whereas corporate planning dept. is likely to be happy with aggregate demand. Forecast by product categories. the more items that forecast are required for, the greater is the need to use straight forward models that require little time to implement.

2. Stability

In stable situations the existing pattern is assumed to continue in the future and past patterns can be easily extrapolated in the future. On the other hand, unstable and uncertain situations require more attention by management and forecasting effort particularly a greater total forecasting effort particularly for latest info.

3. Pattern of data

Analyst must strive to ensure that data obtained from others are accurate, precise and relevant otherwise demand forecasts will be inaccurate. They should be specially careful to determine adequate care was exercised by the source.

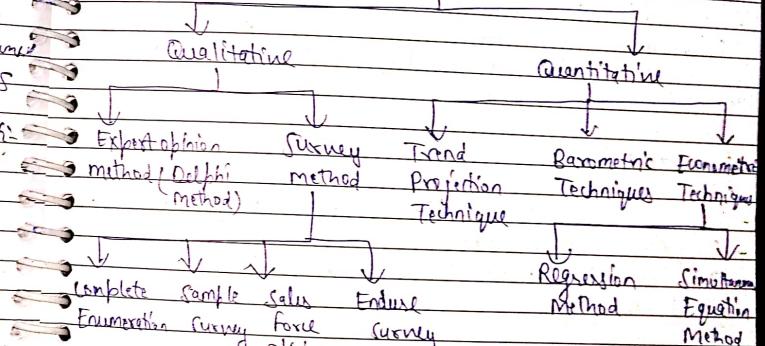
4. Type of Model

~~Model~~ Spiral

management usually need not be expert in the mathematics and the detail of each method. But they should know the assumptions of any model and whether these fit a particular situation the technique used should be easily comprehendible by the management to give quick meaningful result.

* Methods of Demand Forecasting

Forecasting Techniques



i. Qualitative

(a) Expert opinion method

- This method uses personal insight of experts for developing future expectations of the product.
- Experts are informed people who know the product very well and have been dealing

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in it and related product for a long time. If a forecasting is based on the opinion of several experts then it is known as panel consensus method. A specialised form of panel opinion is Delphi method. That is a method of obtaining consensus of expert without direct interaction b/w them. The experts are provided info. and estimates of other experts thus the experts may revise their own estimates in light of other experts' information. Thus responses received are analysed by an independent body. This method takes care of disadvantage of panel consensus where some powerful people may have influenced the direction.

Advantage -

- It is simple to conduct and inexpensive.
- It takes little time.
- It can be used where quantitative data is not possible.

Disadvantage -

- The results are based on the info. provided by one or more persons. and not on the scientific analysis.
 - The experts may be biased.
- They may not know about their future plan or the plan of purchase may change in the future.
- It proves costly and time consuming.
 - It is not successful for the products whose consumers are not concentrated in a certain region. i.e.: their vast spread.

(b) Survey methods

(i) Consumer Complete Enumeration Survey

All potential user of the product are contacted and are asked about their future plan of purchasing the product. Interviews or questionnaire are used to ask questions. All the data collected is then added to ~~total demand~~ arrive at a Method is based on complete survey of all consumers of the commodity.

Advantages -

- It is based on collected data.
- It is not affected by biases.
- It is quite accurate as it surveys all consumers.

Disadvantages -

- They may not know about their future plan or the plan of purchase may change in the future.
- It proves costly and time consuming.
- It is not successful for the products whose consumers are not concentrated in a certain region. i.e.: their vast spread.

a consumer sample survey

- This is a miniature form of complete enumeration method. Here instead of surveying all the consumers only a few consumers called sample are selected and their views on the probable demand are collected. The sample is considered to be a true representative of the entire population. The demand of the sample is then magnified to generate the total demand of all consumers.

Advantages -

- It is good for short term demand.
- It is simple and less costly.
- It consumes lesser time than complete survey.
- The method gives excellent result if used carefully.
- It is useful where forecasting of the variables like feelings, opinion, expectations etc. is not possible.

Disadvantage

- The conclusion is based on the view of only a few consumers and not all of them.
- The sample selection may be wrong.

(iii) Sales force opinion survey

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- Employees of the company who are the part of the sales and marketing teams are asked to predict future level of the demand. The sales force who is selling the product over a period of time is forced to know the demand pattern very well.

Advantages -

- The simplest and quickest of all.
- Includes least cost.
- Company employees are less likely to get biased in opinion.

Disadvantages -

- Consumer's taste keep on changing of which a sale person may be unaware of.
- Sale force may give bias views in view of their future job prospect.

(iv) Consumer End use survey

- Goods can be either producer goods or consumer goods. They can all be the combination of both such are known as intermediary goods.
- This method is used forecasting the demand for intermediary goods. For ex- Milk can be used for the production of butter, cheese, and other dairy products and as well as used in households.

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$$D_{Milk} = D_{mc} + D_{me} - I_m + n_i \alpha_i + n_p \beta_p$$

Here D_{Milk} = Projected demand of milk

D_{mc} = Milk consumption on household basis

D_{me} = Exported demand of milk

I_m = Import of milk.

n_i = Per unit milk requirement of ice cream industry

α_i/β_p = OIP of ice cream industry / paneer industry

n_p = per unit milk requirement of paneer industry.

Advantages

- It is useful for producer good.

- It provides sector wise demand forecast for different industries.

- It requires complex and diverse calculations.

- The data of other industries is not readily available or erroneous.

- It is time and money consuming.

1. Qualitative methods

The Qualitative Techniques: contains info. about likes and dislikes of the consumer. If is used for short term forecasting.

2. Quantitative methods (statistical Methods)

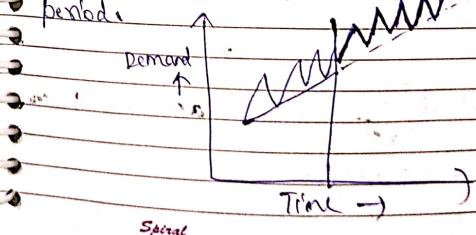
These method forecast future demand by the data from the past and extrapolate it to make forecast of future levels. It is suited for long term forecasting.

(a) Trend Projection Method

In this method historical data is collected and fitted into some kind of repetitive behavioural pattern. This trend is then extrapolated to the future to get the demand for forecast period. This technique assumes that whatever has been the pattern of demand in the past will continue to hold good in the future as well. The trend could be linear or curve or have any other complex shape. Future demand to trend projection method can be found by either of two methods:

(i) Graphical method

In this method the past data will be plotted on the graph and identified trend or behaviour will be extended further in the same pattern to ascertain the demand in forecast period.



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(iii) Algebraic Method

In this the demand & time data are fitted into a mathematical equation. Some of the most common trend equations are

(i) Linear trend

$$Y = a + bn$$

(ii) Quadratic trend

$$Y = a + bn + cn^2$$

(iii) Cubic trend

$$Y = a + bn + cn^2 + dn^3$$

(iv) Exponential trend

$$Y = ae^{bt}$$

(v) Double log trend

$$Y = an^b$$

Advantages of Trend projection

It is a very simple method.

The method provides reasonably accurate forecast.

It is quick and inexpensive.

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Disadvantages

- It can be used only if past data is available.
- It is not necessary that past trend may continue to hold good in the future always.
- It cannot be used for short term estimates where trend is cyclical with sharp turning points.

(b) Barometric Techniques

Like Meteorologists use the barometer to forecast weather conditions on the basis of movements of mercury in the barometer following the logic of this method economic indicators are used as a barometer to forecast trends in the demand.

The correlation b/w two time series can be of three types

- (i) Leading
- (ii) Lagging
- (iii) Coincident

Either the second series data can move ahead or move behind or move along. The 1st series of data leading, lagging and coincident respectively. For ex - the construction building needs cement, steel, to light etc. thus one can say that const. of building is the leading indicator of the

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barometer for the demand of cement.

Advantages -

- TF is simple.
- TF predicts directional changes accurately.

Disadvantage -

- TF does not predict the magnitude of change very well.
- Finding out a leading indicator for any series is not always feasible.
- The method can be used for short term forecasting only.

(C) Econometric Techniques

The econometric methods combine statistical tools with economic theories to estimate economic variables and forecast the intended economic variables. An econometric model may be a single equation, regression model or it may consist of a system of simultaneous equations. Single equation regression serves the purpose of demand forecasting in the case of most commodities. But when explanatory economic variables are so interrelated and interdependent that unless one is determined the other cannot be determined. A single equation regression model does not serve the

purpose. In that case a system of simultaneous equations is used to estimate and forecast the target variable.

The econometric methods are of two types -

(i) Regression method

In this method, the single equation econometric model is analysed. A single equation can be

→ Single variable →

$$D_n = a + bY$$

that is demand depends upon one variable only. like population (Y)

→ Multivariable

$$D_n = a + bP_n + cI + dA - eP_y$$

i.e. demand depends upon multiple variables like Price, Income, etc.

(ii) Advantages -

- It produces reliable, accurate and causal relationship b/w variables forecasting.
- Besides forecasting it also explains economic phenomena.
- It forecast both the magnitude and direction of change.

Disadvantages:

- Method uses complex calculations
- It is time consuming and costly.
- It requires the use of other forecasting techniques for estimating the value of independent variables.

Simultaneous Equation Method

In this method of forecasting involves estimating several equations. It enables the forecaster to take into account the simultaneous interaction between dependent and each independent variable.

Steps required -

(a) The first step is to develop a complete model and specify the behavioural assumptions on the variables included.

(b) The variables are of two types -

• Endogenous variables

These are controlled variables i.e. within the control of the firm i.e. internal to the firm.

• Exogenous variables

These are uncontrolled variables i.e. outside of the control of the firm i.e. text, time, weather, etc.

(b) The 2nd step is to collect the necessary data on both endogenous and exogenous variables.

(c) The last step is to solve equations generally by two stage least squares method which is used to predict the values of exogenous variables.

Advantages

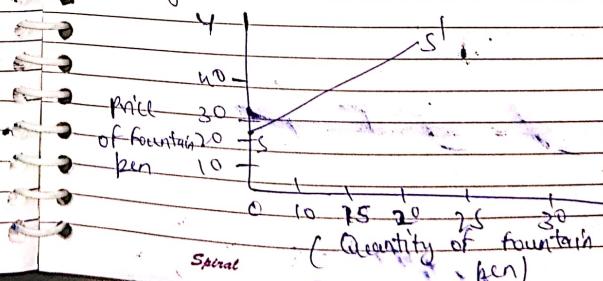
It is capable of capturing the effect of interdependence of the variables.

Disadvantages

The use of this method sometimes hampered by non availability of adequate data.

* Law of supply

Higher the price, supply gets increased where all the remaining are constant except demand.



Price of fountain
pen (Rs)

10

20

30

40

Quantity
supplied

10

13

20

25

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