

UNIT - I

ECONOMICS

Economy : A situation where we have resources and unlimited wants.

Ex: Individual (x person salary 20,000) and unlimited wants. food expenses 5000 ; Travelling expenses 2000, Educational expenses 25,000 and so on....

Economics : Economics is a study of how to use resources in order to satisfy the unlimited wants.

NOTE : Allocating the scarce resources.

Economics is a both science & art :

If any subject consider as a science, it must be

satisfied certain conditions.

- It must be having systematic body.
- Cause and effect relation.
- It must be measurable.
- It must be forecasting.
- It must be having certain methodology.

→ Inductive

→ Deductive

Arts :

Fundamentally, it has to follow certain systematic principles.

NOTE : Economics is a both science & art.

Economic definitions :

According to Adam Smith. (Father of economic)

Economics is defined as the study of Nature and uses of national wealth.

A/c to L. Robbin's, Economics as the Science which studies of human behaviour as a relationship between ends and scarce means which have alternative uses. with these, economics shifted from wealth to human beings.

→ The silent features of economics,

A/c to Robbin's

1. unlimited wants

2. Scarce resources

3. Alternative uses

4. choices

Types of Economics :

They are : 1. micro economics

2. macro economics

micro economics :

micro economics means study of individual consumers/customers. / individual firm. It is also called firm theory.

→ micro economics deals with behaviour & problems of single individual and of micro organisation.

macro economics :

The study of aggregate (or) total of economic activity in a country (or) in industry is called as macro economics.

→ It studies the flow of resources (or) factors of production such as i.e., land, labour, capital, organisation, technology, material and so on.

From the resources, owner to the business and then from business firm to house holders.

Management :

It is a science and art of getting things done through the people. In formally, organised groups.

→ It is necessary that every organisation is well managed to enable it, to achieve its desire goals.

Manager :

manager is a person who work done through others. (manager can monitor all the activities in the organisation, under the control.)

II Managerial Economics : (Introduction for Nature & Scope)

(managerial economics consists of two words i.e. management and economics.) The science of managerial economic has emerged recently, with going of variability and predictability of the business environment. Business managers have become increasing, the concerned with finding to an explicit of environmental changes.

The managerial economic subject of get popularity in USA after publication of managerial economics by "Jeel Dean".

According to Spencer and siegelman, managerial economics is, "The integration of economic theories ^{policy} with business practices for the purpose of facilitating the ^{problem solving} decision making and forward planning by management."

According to pappas, "managerial economics is Application of economic theories."

→ According to Michel Bavaye "managerial economic is
" study of how direct resources in a way that
most effectively achieve a managerial.

→ A/c to Dr. Hague, managerial economics is a
fundamental academic subject, which seems to
understand & analyze the problems of the business.

Nature of managerial economics:

- 1) It close to micro economics.
- 2) It covers back drop of macro economics.
- 3) Normative statements.
- 4) Prescriptive actions
- 5) It give alternative actions & choices.
- 6) It has certain assumptions & limitations.
- 7) Applied nature.

1) It close to micro economics:

managerial economics concerned with finding
the solution for different managerial problems of a
particular firm (or) individual firm. Thus, it is more
close to micro economic. It is also consider as
Theory of the firm.

2) It covers backdrop of macro economics:

The macro economic conditions, the economy
also seen as limiting factors for the firm to
operate, such as govt. policies, inflation, deflation,
stagulation.

Inflation → Increase the price of goods & services continuously.

Deflation → Pricing the level of goods & services decreases

Stragulation → Pricing the level of goods & services increases & decreases.

3) Normative statement:

'ought' A normative statement includes or implies 'out' or 'should'. They reflect people moral attitudes and are expressions of what a team of people ^{ought} to do.

4) Prescriptive Actions:

Prescriptive actions are consider as a goal oriented actions (or) objective oriented actions. It ensures that, the course of action from available alternatives of the firm for optimal solution.

5) It gives Alternative actions:

m.E provides opportunity to evaluate each alternative in terms of sales & Revenue as well as profits. The m.E can decided, which is the best suitable alternative for the firm.

6) It have certain assumptions & Limitations:

Every concept and theory of m.E is based on certain assumptions & Limitations. where there is no a change in assumptions, the theory may not hold at good.

7) Applied nature :

models are built, to reflect the real life of complexity and this models are help to the managers, for taking decisions.

The different areas, where the models are extensively used in inventory control (ABC analysis), optimization and so on....

Scope of managerial Economics :

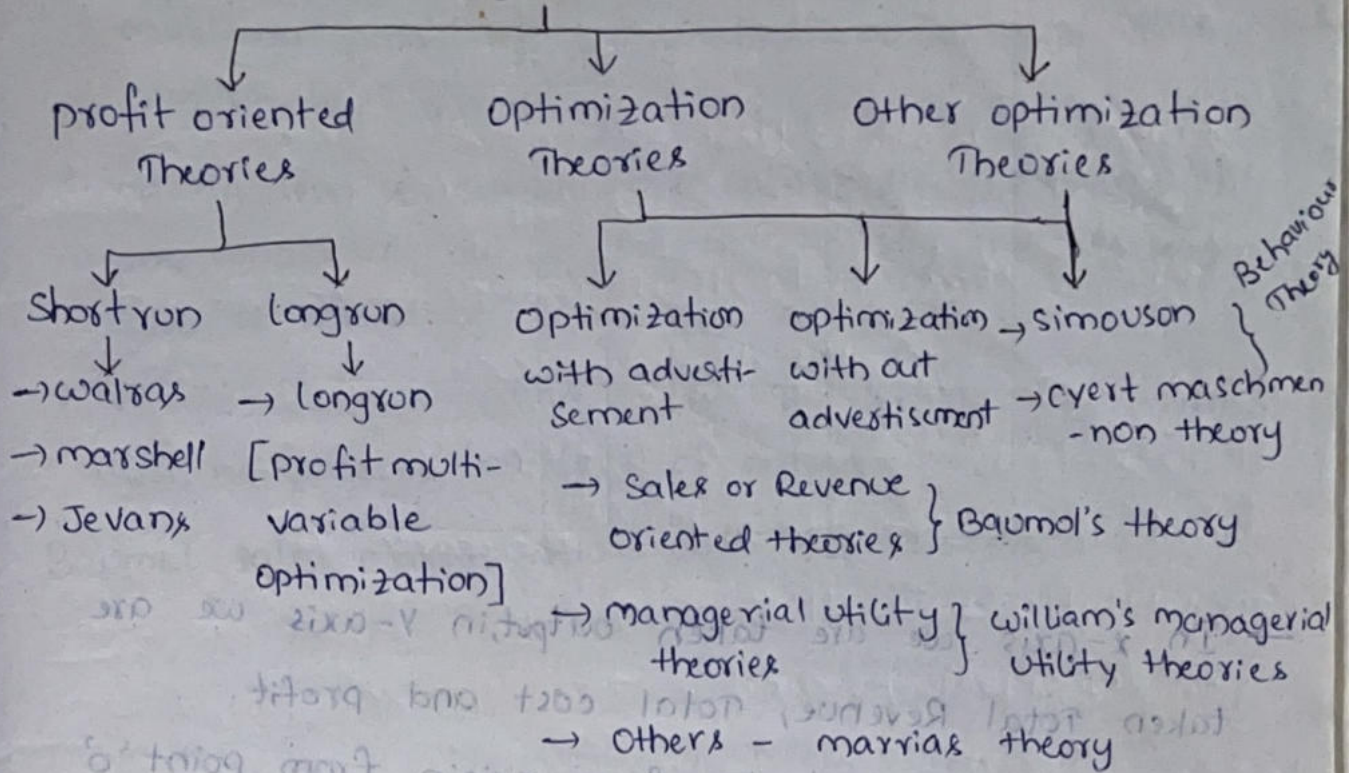
- Concepts & Techniques of m.E →
- * Demand forecasting
 - * Production analysis
 - * Cost analysis
 - * Price analysis
 - * Inventory analysis
 - * Technology changes
 - * Advertisement expenditure analysis
 - * Resources analysis
- Getting optimal solution

The main focus of managerial economics to find the optimal solution to m.E. The problem may be related to demand forecasting analysis, production, cost, price, Inventory, Technology, Advertisement, Expenditure, Resource analysis.

Theories of the firm :

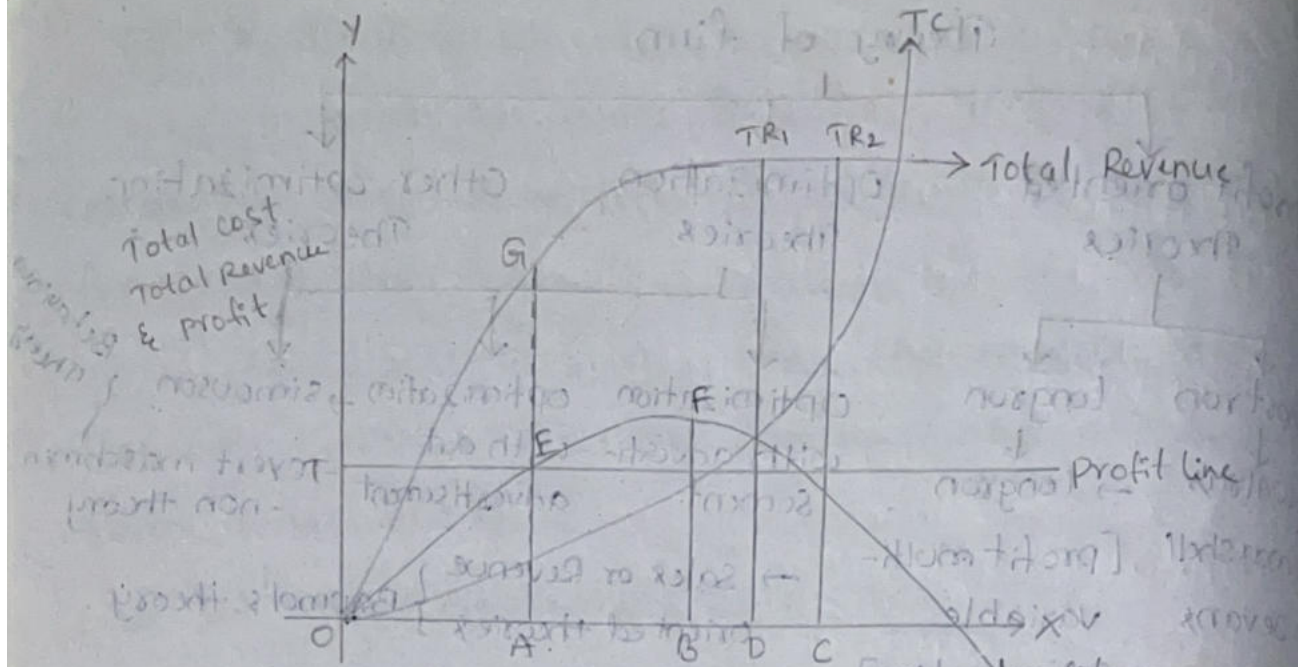
Theory of the firm means any theory or group of theories, which attempts to know the firms behaviour under different market conditions (monopoly market, perfect-competition market, oligopoly market).

Theory of firm



Baumol's sales maximization model (Assumption):

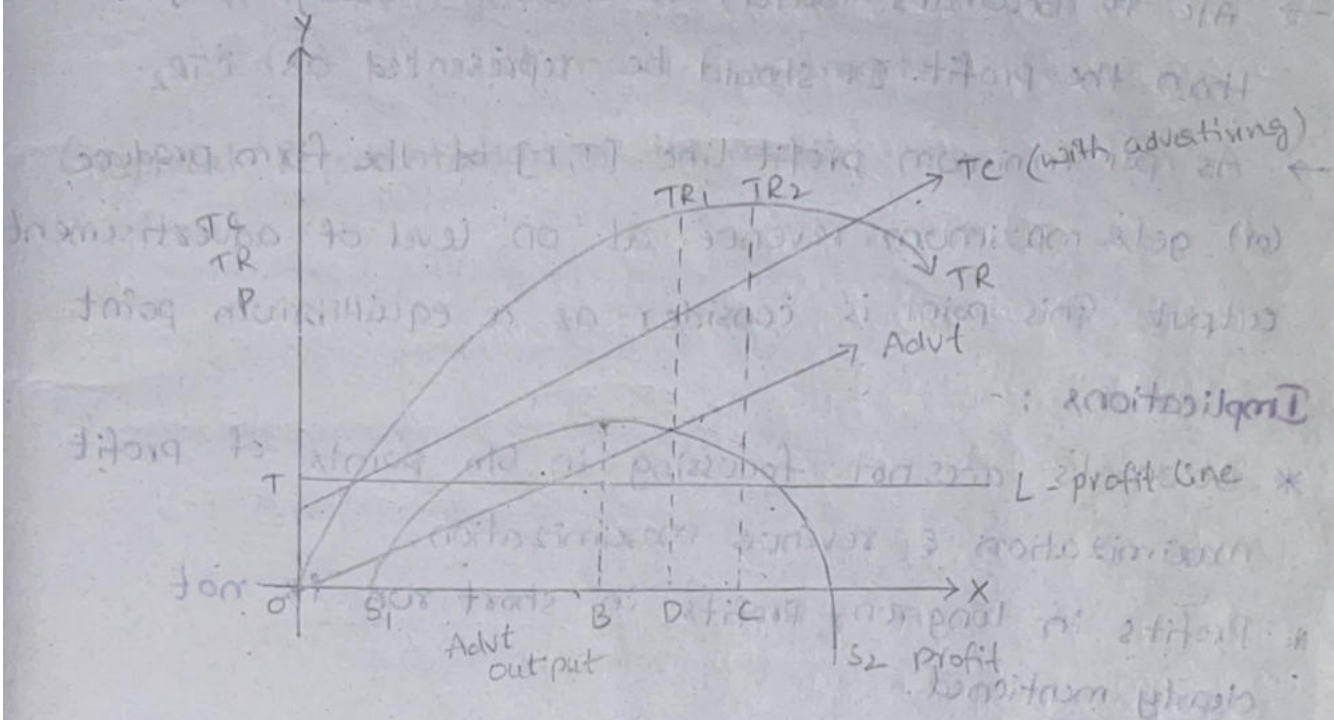
1. Baumol's Sales maximization model explain about oligopoly market.
2. Total sales or total revenue of the organization always higher than ^{minimum} profits of the organization.
3. Profits of the organization are found always minimum with respect to minimum profit line & it leads to increase the sales and market shares of the organization.
4. Total cost curve always in 'u' shape, demand curves always in a downward sloping.
5. Total Revenue, Total cost of curves always should be consider as a conventional category.



- In x-axis we are taken output, in y-axis we are taken Total Revenue, Total cost and profit.
- Total cost curve starts from origin from point 'o' and increases gradually, increases with respect to output of the organisation.
- Total revenue also starts from origin and increases upto certain limit, then decreases.
- Profit line always located b/n the Total Revenue and Total cost. In this way, firms having certain profit line and this profit line consider as a minimum profit line.
- In above fig. it represent, as a profit line.
- A/c to Baumel's sales maximization model, assumptions firms must be gets maximum Revenue (or) Sales. w.r.to minimum profit of the organisation, it is represented as a C, TR_2 at the level of OC output.
- As per minimum profit line assumption, firm produce OD level of output, w.r.to Revenue (or) Sales, it should be represented as D, TR_1 .

- In above graphical representation firms get maximum profit at 'OB' level of output and this point as measured as 'F'.
- At 'OA' level of output, firm satisfy the minimum profit line condition but it does not satisfy the maximum sales, it should be represented as AGE line.
- Finally, if firm wants in a equilibrium stage, firms must be produce 'OD' level of output.

Baumol sales maximization with Advertisement:



- According to the Baumol's Sales (or) Revenue maximisation model with advertisement.
- Firms have two alternatives to increase the revenue (or) sales.
 - a) To cut the prices
 - b) To increase the advertisements without changing price.

With the following of second condition in the diagram, in vertical axis TR, TC & Profits. In horizontal axes we are taken advertisement output.

- Total Revenue starts from origin and increases up to certain point of the production and then decreases.
- Total cost starts from above origin $[F+v]$ and increases simultaneously with production of the firm.
- Advt Line Curve increases parallel to the total cost [below the Tc line].
- S_1, S_2 curve is considered as a profit line at OB level of output organisation in maximum profits.
- As to Baumol's model, revenue is always higher than the profit. It should be represented as CTR_2 .
- As per minimum profit line $[T, L]$ of the firm produce (or) gets maximum revenue at 'OD' level of advertisement output. This point is considered as an equilibrium point.

Implications :

- * Baumol's does not focussing in b/n points of profit maximization & revenue maximization.
- * Profits in long run, Profits in short run is not clearly mentioned.

Oliver E williamson managerial utility Theory :

According to Oliver E williamson, [1964] Profit maximisation is not the objective of joint stock organisation. The sole objective of the theory is utility maximisation of the manager rather than profit maximisation.

Assumptions :

- (a) It explains about oligopoly market.
- (b) Diverse of management and ownership.
- (c) A minimum profit contains exist for the firms to be able to pay dividends to their shareholders.

Williamson managerial utility function:

It includes variables such as salary, job security, power, prestige and professional excellence of the managers. out of these, salary is considered as a quantity variable [which is measurable]. The remaining variables are considered as not quantity variable.

$$Utility = S, m, Id$$

where, S = Management of staff expenditure (salary)
 m = management stock emoluments (Share)

Id = Discretionary Investments

Graphical Representation of the model:

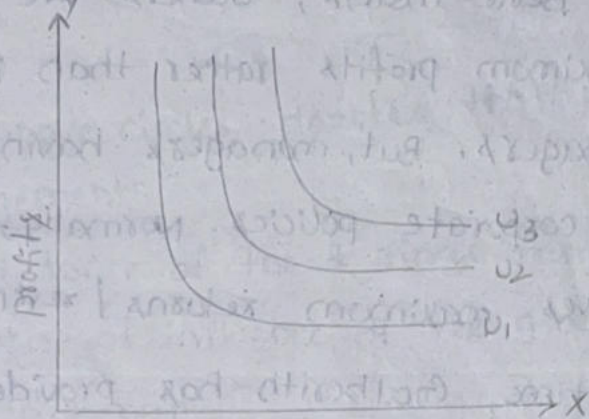
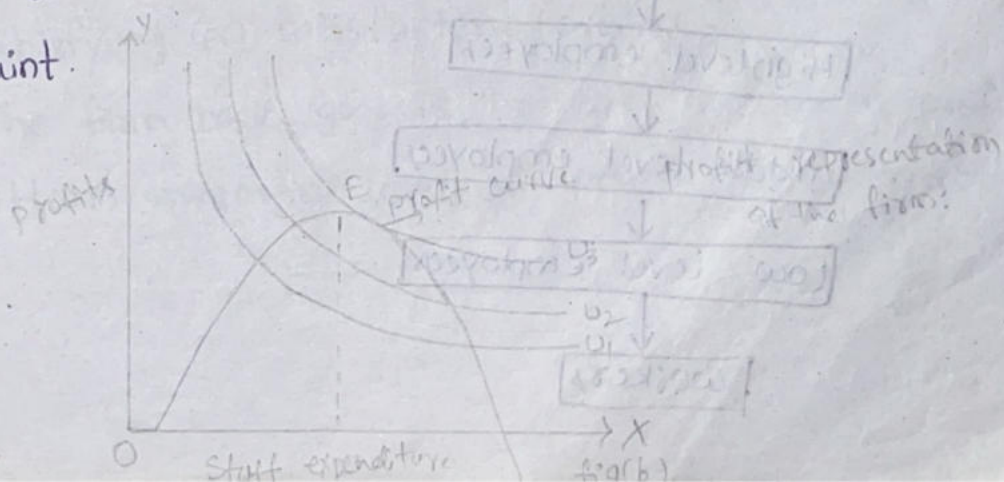


Fig (a) Staff salary

→ If U_1, U_2, U_3 derived by the manager and these are considered as a utilities of the manager.

→ Higher differentiation curve, higher utility by the manager. Hence, the manager would try to be the highest level. In difference curve possible in a given constraint.



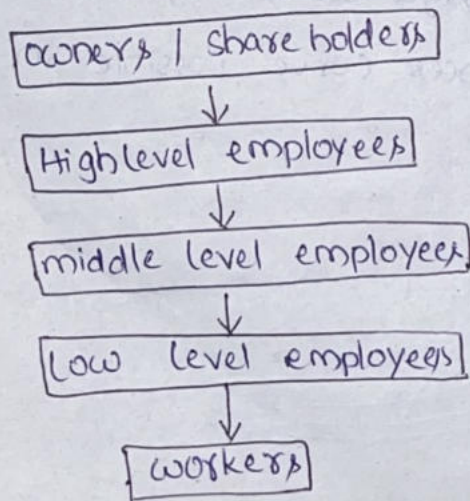
- To find the equilibrium model (or) point in above diagram a and b are super imposed. The equilibrium point is where the distationary profit curve is tangent to the highest. Indifference (utility) curve of the manager which is at point 'E'.
- A/c to Williamson concept 'E' is consider as a equilibrium point.

Berle - means / Galborith - corporate social structure:

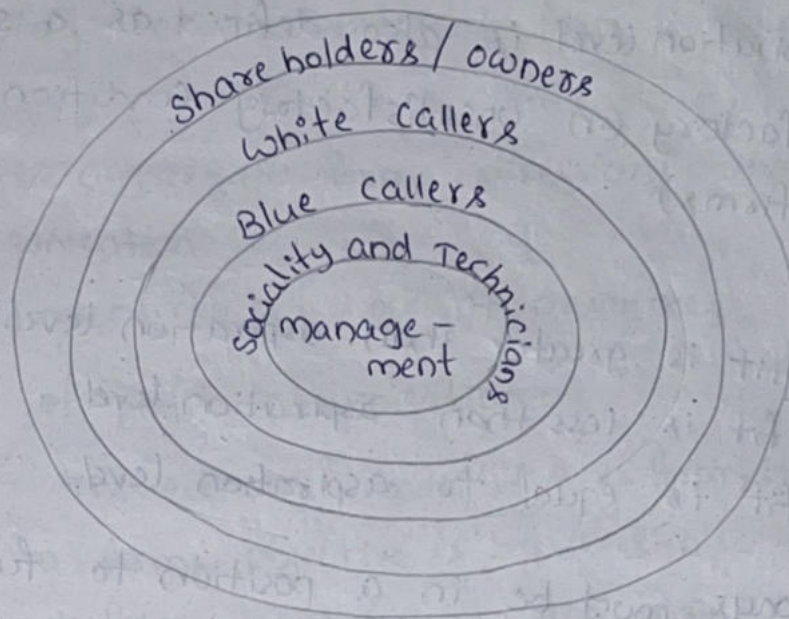
Berle - means suggested for implications of the separation of ownership and management in the model corporation.

According to Berle - means, owners are focusing on how to get maximum profits rather than provide benefits to the managers. But, managers having a power and knowledge on corporate policies. Normally, sufficient investment fund gives maximum returns / revenues.

In recent time, Galborith has provide several variations and additions to the Berle - means theory. A/c to Galborith & Berle - means, Traditional corporate structure may be depicted in terms of vertical corporate structure. It follows certain higherarchical control.



As to Galbraith, the power structure of modern corporation ~~being~~ is in a concentric way and central power.



- The above circles denotes that identification of the management.
- The distance of the * rings from the central signifies, the extent of influence of the group on the objective of the management.

IV Behaviour Theories:

H. Simon's Satisficing Behaviour Theory:

According to H. Simonson's [he belongs to as a economist]. According to him, the firm basic principle, the objective is not getting a maximum profit but satisfying (or) satisfactory profits.

The firm basic goal is not get maximum profits but attain minimum level of profit rate of growth.

The firm aspires to achieve certain (or) minimum target level of profit. Its aspiration level is based on different levels of goals. Such as production of product, price, place, profit and so on.

The aspiration level is also defined as a situation between satisfactory (or) unsatisfactory condition. (In terms of firms).

Conditions :

1. Actual benefit is greater than aspiration level.
2. Actual benefit is less than aspiration level.
3. Actual benefit is equal to aspiration level.

NOTE : Firm always must be in a position to fulfill the 1 and 3 conditions.

Weaknesses :

- Simonson's main criticism is, it does not give clear information about the level of profit.
- Baumol's and O'Williamson's are also criticism about profit conditions [Baumol's assumptions].

Cyert & March Behavioural Theory :

Behaviour of the firm started in the year of 1930 to 1950, after some seminal (strong support) by the Simonson in his article [Economic reform - Quarterly in 1955].

In addition to Simonson theory, Cyert & March elaborated the behaviour of the firm in the year of 1963.

Cyert & March model focusing on the way decisions are made in "large, multi-product" ^{Firm} under uncertainty conditions.

These model emphasise (focus) on internal structure of the firm and effect of the problem on decision making.

Cyert & March focus on firms behaviour by applying common external force & their behaviour.

Limitations:

1. This aggregate firms decisions impact on whole organisation.
2. complex may be phase at overtime.

Model of profit maximisation:

The economic model of the firm, it is assumed that a firms objective is to maximise their profits in short term period (1 year), the various forms of market structure. Such as, perfect competition, monopoly & monopolistic competition market. They explain the determination of price-output, By assuming the firms maximum profits in a short run.

Normally, profit is calculated by deducting the total cost from the total revenue.

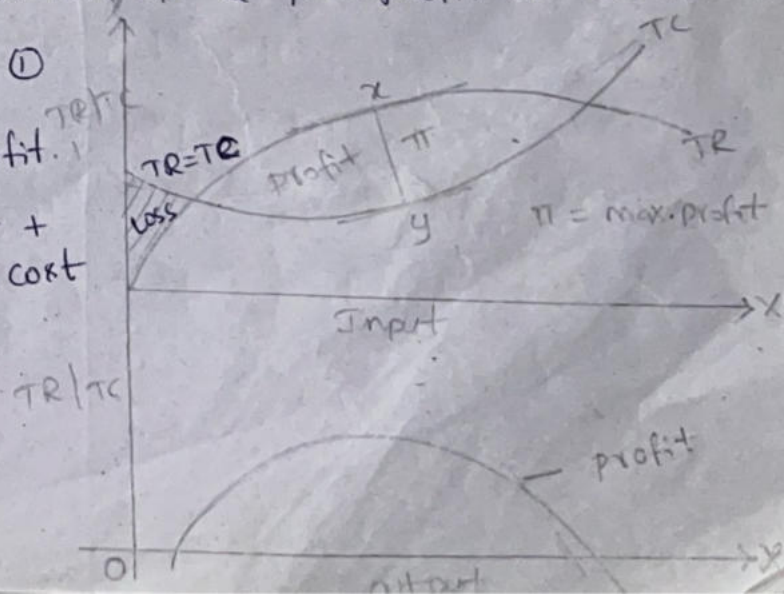
$$P = TR - TC$$

NOTE: Accounting & Economic profits are different. where economic profit is considered as a pure profit of the firm.

$$\pi = TR - TC \rightarrow \textcircled{1}$$

where π = economic profit.

$TC = \text{fixed cost} + \text{variable cost}$



Determination of profit maximisation :

For determination of profit maximisation, firms must be satisfied 2 conditions.

condition-1 : Derivation of eq. ① = 0

$$\frac{d\pi}{dQ} \Rightarrow \frac{dTR}{dQ} - \frac{dTC}{dQ} = 0$$

$$\frac{d(TR)}{dQ} - \frac{d(TC)}{dQ} = 0$$

$$\frac{d(TR)}{dQ} = \frac{d(TC)}{dQ}$$

2. Square of above derivation eq. must be < 0

$$\frac{d^2\pi}{dQ^2} \Rightarrow \frac{d^2(TR)}{dQ^2} - \frac{d^2(TC)}{dQ^2}$$

$$\frac{d^2(TR)}{dQ^2} - \frac{d^2(TC)}{dQ^2} < 0$$

Limitation :

1. Profit maximisation theory does not focussing on behaviour of the firm.
2. This model does not gives time for get maximisation of the profits.

$$\pi = TR - TC$$

Differences b/n Profit maximisation & wealth maximisation

Profit maximisation:

Financial management concern with proper utilization of Profit in a efficient manner that will increase the value + earnings of the firms.

→ There are two ~~para~~ parameters of objectives by the financial management.

1. Profit maximization

2. wealth maximization

→ Profit maximization is the capacity of the firm in producing maximum output with limited inputs (or) it uses minimum inputs for producing stated output. It is termed as firms to ~~for~~ most (or) most important objective.

→ It has been traditionally recommended that the main motive of any business organisation to earning a profit. It is essential for sustain their business activities in a competitive environment.

→ Normally, profit is calculated by subtraction the total cost of the firm from the total earnings of the firm. when total cost decreases (or) total revenue increases will be effect on profits of the firm.

→ The extension of any business activities will be depends on profits of firm.

→ So that, there is a mean to improve the profit maximisation level.

Wealth maximisation:

- wealth maximisation is the ability of the firm of a company of its common stock over the time.
- The market value of the firm is will be depends on different factors like good will, Service after sales, producing quality products and soon.
- It is also consider as goal of the company & highly recommended criteria for evaluating the performance of business organisations. This will help to increase the market share of the firm in the competitive market.
- It is universally accepted that the fundamental goal of the firm or business enterprises is to increase the wealth of its shareholders, They buy the shares of the company with the expectations of maximum returns in with in the time.

Profit maximization	wealth maximization
<u>concept:</u> 1. The process through which ^{Company Capable of} the increase earning capacity is known as profit maximization.	<u>concept:</u> 1. wealth maximization is the ability of firm to increase their value of stock in the market.
<u>Emphasise on:</u> 2. short term of the objective	<u>Emphasise on:</u> 2. Long term objective.
<u>consideration:</u> 3. profit maximization ignores Risk & uncertainty.	<u>consideration:</u> 3. wealth maximization consider both.

Time:

4. Profit maximization avoid the time & value.

Advantage:

5. Profit maximization is necessary for survival and growth of the firm.

Time:

4. wealth maximization recognise it.

Advantage:

5. It is necessary for to attain maximum market share.

3

DEMAND ANALYSIS—II: ELASTICITY OF DEMAND

Learning Objectives

After completing this chapter, you should be able to understand

- elasticity of demand and its types
- factors affecting elasticity of demand
- measurement of elasticity
- significance of elasticity of demand

INTRODUCTION

In the previous chapter, you have studied the laws governing consumer behaviour, concepts of demand, laws governing demand and changes in price and quantity demanded. There, you were concerned only with direction of changes in prices and quantities demanded. These changes are not so far quantified. Measuring these changes is necessary to study the changes in quantity demanded in relation to changes in price, income or prices of substitutes/ complementaries and there by take important decision whether to increase the price or reduce the price without suffering a loss in demand for goods and services.

This chapter explains the concept of elasticity of demand, its types, factors affecting elasticity of demand, how to measure elasticity and make use of the concept of elasticity of demand in our day-to-day life.

ELASTICITY OF DEMAND

Most of the times, it is not enough to understand the increase or decrease in price and its consequential impact of change in the quantity demanded. It is necessary to find out the extent of increase or decrease in each of the variables for taking certain managerial decisions. This paves the way for the concept of elasticity of demand.

The term 'elasticity' is defined as *the rate of responsiveness in the demand of a commodity for a given change in price or any other determinants of demand*. In other words, it explains the extent of change in

quantity demanded because of a given change in the other determining factors, may be price or any other factor(s).

Measurement of Elasticity

The elasticity is measured in the following ways:

- (a) Perfectly elastic demand
- (b) Perfectly inelastic demand
- (c) Relatively elastic demand
- (d) Relatively inelastic demand
- (e) Unity elasticity

These are explained below.

(a) Perfectly Elastic Demand When any quantity can be sold at a given price, and when there is no need to reduce price, the demand is said to be *perfectly elastic*. In such cases, even a small increase in price will lead to complete fall in demand. This is illustrated in Fig. 3.1(a).

Figure 3.1(a) reveals that the quantity demanded increases from OQ to OQ_1 , from OQ_1 to OQ_2 even though there is no change in price. Price is fixed at OP .

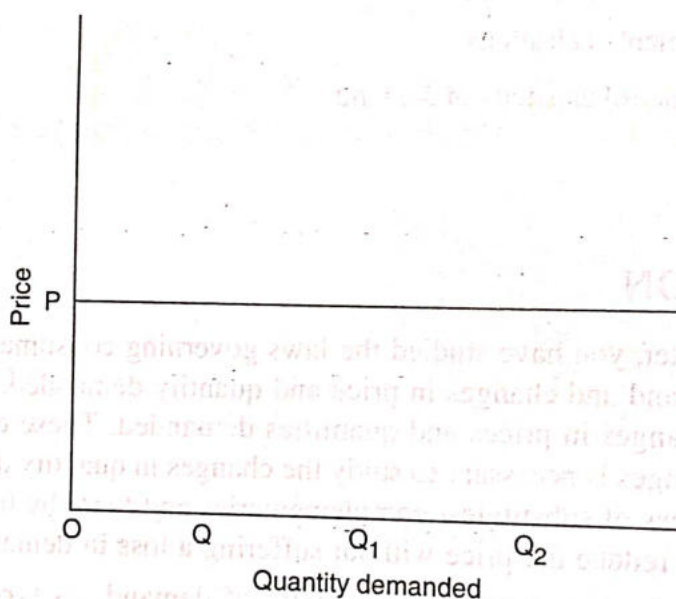
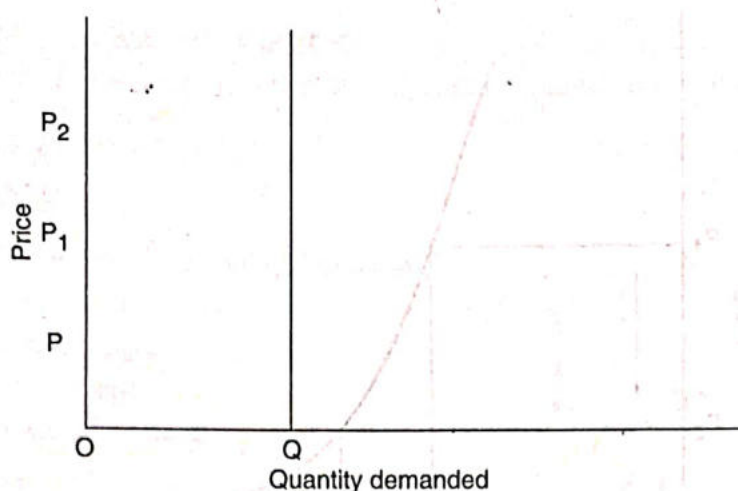


Fig. 3.1(a) Perfectly Elastic Demand

(b) Perfectly Inelastic Demand When a significant degree of change in price leads to little or no change in the quantity demanded, then the elasticity is said to be *perfectly inelastic*.

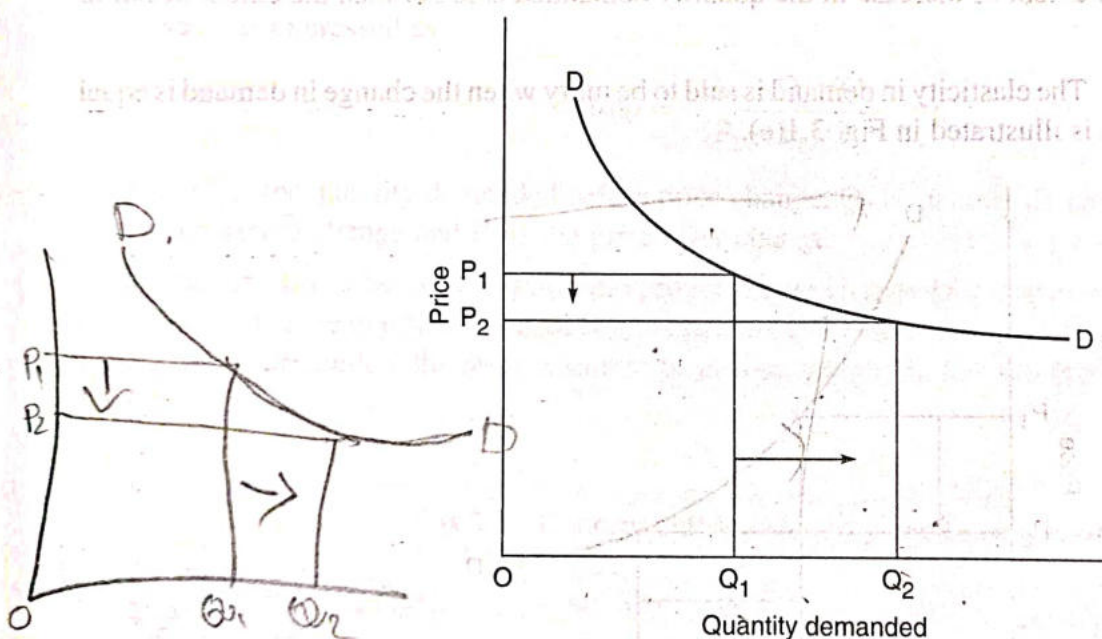
In other words, the demand is said to be perfectly inelastic when there is no change in the quantity demanded even though there is a big change (increase or decrease) in price.

Figure 3.1(b) reveals that there is no change in the quantity demanded though there is change in price, say increase or decrease. In other words, despite the increase in price from OP to OP_1 , the quantity demanded has not fallen down. Similarly, though there is a fall in the price from OP_3 to OP_2 , the quantity demanded remains unchanged.

Fig. 3.1(b) *Perfectly Inelastic Demand*

The concepts of perfectly elastic and perfectly inelastic demand do not manifest in real life.

(c) Relatively Elastic Demand The demand is said to be relatively elastic when the change in demand is more than the change in the price. Figure 3.1(c) reveals that the quantity demanded increases from OQ_1 to OQ_2 because of a decrease in price from OP_1 to OP_2 . The extent of increase in the quantity demanded is greater than the extent of fall in the price.

Fig. 3.1(c) *Relatively Elastic Demand*

(d) Relatively Inelastic Demand The demand is said to be relatively inelastic when the change in demand is less than the change in the price. This is illustrated in Fig. 3.1(d).

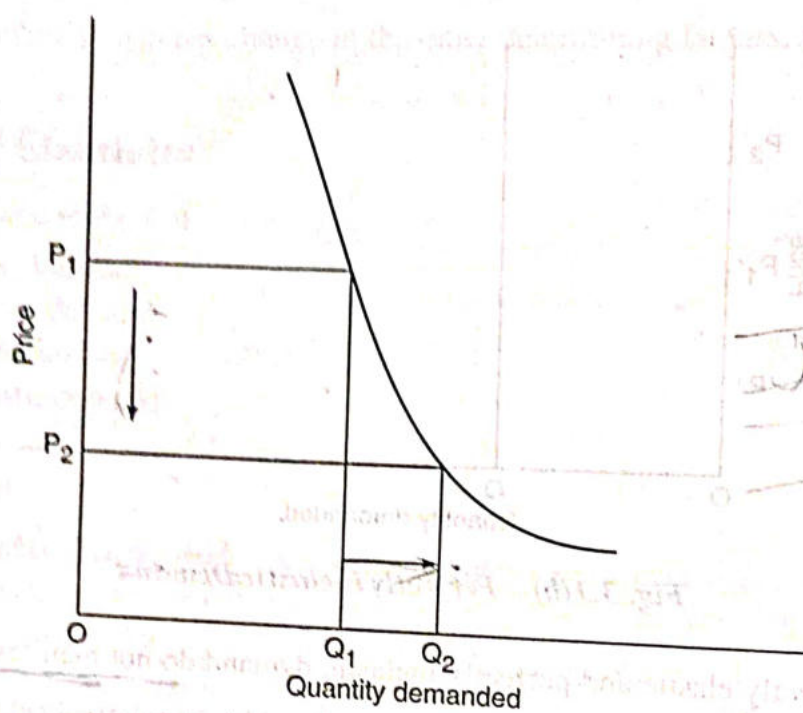


Fig. 3.1(d) Relatively Inelastic Demand

Figure 3.1(d) reveals that the quantity demanded increases from OQ_1 to OQ_2 because of a decrease in price from OP_1 to OP_2 . The extent of increase in the quantity demanded is lesser than the extent of fall in the price.

(e) Unity Elasticity The elasticity in demand is said to be unity when the change in demand is equal to the change in price. This is illustrated in Fig. 3.1(e).

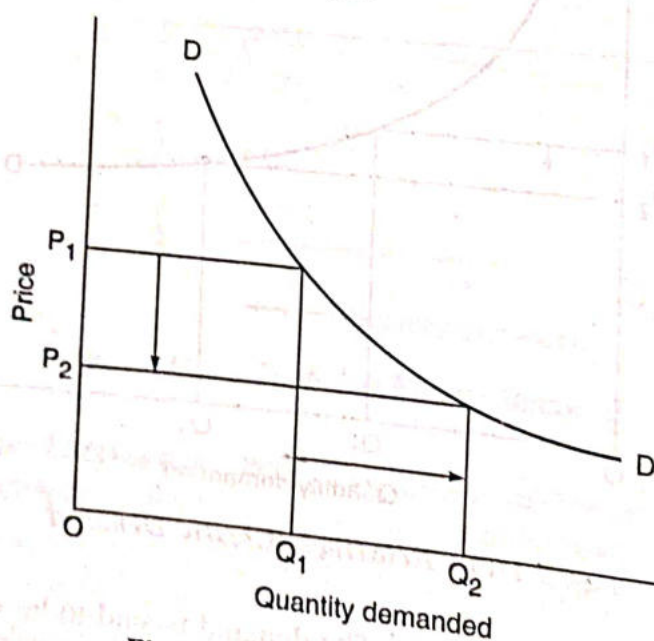


Fig. 3.1(e) Unity Elasticity

Figure 3.1(e) reveals that the quantity demanded increases from OQ_1 to OQ_2 because of a decrease in price from OP_1 to OP_2 . The extent of increase in the quantity demanded is equal to the extent of fall in the price.

Types of Elasticity

The following are the four types of elasticity of demand:

- (a) Price elasticity of demand
- (b) Income elasticity of demand
- (c) Cross elasticity of demand
- (d) Advertising elasticity of demand

These are explained below:

(a) Price Elasticity of Demand Elasticity of demand in general refers to price elasticity of demand. In other words, it refers to the quantity demanded of a commodity in response to a given change in price. Price elasticity is always negative which indicates that the customer tends to buy more with every fall in the price. The relationship between the price and the demand is inverse.

price
income
cross
ad

It is measured as follows:

$$\text{Price elasticity of demand} = \frac{\text{Proportionate change in the quantity demanded for product X}}{\text{Proportionate change in the price of X}}$$

The same is expressed as

$$Ed_p = \frac{(Q_2 - Q_1)/Q_1}{(P_2 - P_1)/P_1}$$

Where Q_1 is the quantity demanded before price change, Q_2 is quantity demanded after price change, P_1 is the price before change and P_2 is the price after change.

The price is said to be elastic, when the proportionate change in quantity demanded is more than the proportionate change in price. For instance, a 5 percent fall in the price results in an increase of 20 percent in the quantity demanded, the price is said to be elastic, which implies that the elasticity is more than one ($e > 1$).

Box 3.1 Concept of Price Elasticity and Impact on Revenue Summarised

Price elasticity of demand What this means Impact on Price

$ED > 1$ (elastic demand) Percentage change in quantity demanded greater than percentage change in Price Revenue increases with every fall in price

$ED = 1$ (Unity elasticity) Percentage change in quantity demanded is equal to percentage change in Price Revenue remains unchanged even though there is fall in the price

$ED < 1$ (Inelastic demand) Percentage change in quantity demanded less than percentage change in Price Revenue decreases when price is lowered

On the other hand, if the price is said to be inelastic then it means that the proportionate change in the quantity demanded is less than the proportionate change in the price. A 10 percent increase in price resulting in a 2 percent drop in the quantity demanded of the product implies a product where the demand is said to be price inelastic, which means the elasticity is less than one ($e < 1$).

Example 1 Elastic price demand ($e > 1$):

Determine the price elasticity of demand given that

- the quantity demanded for product M is 1000 units at a price of Rs. 100.
- the price declines to Rs. 90 and the quantity demanded increases to 1500 units.

Solution

$$Edp = \frac{(Q_2 - Q_1)/Q_1}{(P_2 - P_1)/P_1}$$

Let us define these variables here.

$Q_1 = 1000$ units (quantity before change)

$Q_2 = 1500$ units (quantity after change)

$P_1 = \text{Rs. } 100$ (price before change)

$P_2 = \text{Rs. } 90$ (price after change)

$$Edp = \frac{(1500 - 1000)/1000}{(90 - 100)/100} = -5$$

Since Edp is -5 , it means that for a 10 percent change in price, there is a change in demand by 50 percent. Where the numerical value of elasticity is more than one, the demand is *elastic*. In other words, the percentage of increase in quantity demanded is more than the percentage of decrease in price.

Example 2 Inelastic price demand ($e < 1$):

Determine the price elasticity of demand given that

- the quantity demanded for product M is 1000 units at a price of Rs. 100.
- the price declines to Rs. 70 and the quantity demanded increases to 1100 units.

Solution

$$Edp = \frac{(Q_2 - Q_1)/Q_1}{(P_2 - P_1)/P_1}$$

Let us define these variables here.

$Q_1 = 1000$ units (quantity before change)

$Q_2 = 1100$ units (quantity after change)

$P_1 = \text{Rs. } 100$ (price before change)

$P_2 = \text{Rs. } 70$ (price after change)

$$Edp = \frac{(1100 - 1000)/1000}{(70 - 100)/100} = -0.33$$

Box 3.2 Price Elasticity for Goods and Services

Price elasticity for various goods and services varies based on number of factors such as number of substitutes available, urgency in use etc. For instance, where there are more number of substitutes (as in case of brinjals or cabbage), a product may have higher price elasticity and vice versa. Price elasticity is low for public utility services such as transport and electricity used for domestic purposes). Observe the following table.

Goods/services	Price elasticity
Brinjals	3.5
Cabbage	2.8
Health insurance	1.9
Public transport	1.0
Electricity for domestic purpose	0.5

Since E_{dp} is -0.33 , it means that for a 10 percent fall in price, there is an increase in demand by 3.3 percent. Where the numerical value of elasticity is less than one, the price demand is *inelastic*. In other words, the percentage of increase in quantity demanded is less than the percentage of decrease in price.

Example 3 Unity price elasticity ($e=1$):

Determine the price elasticity of demand given that

- the quantity demanded for product M is 1000 units at a price of Rs. 100.
- the price declines to Rs. 50 and the quantity demanded increases to 1500 units.

Solution

$$E_{dp} = \frac{(Q_2 - Q_1)/Q_1}{(P_2 - P_1)/P_1}$$

Let us define these variables here.

Q_1 = 1000 units (quantity before change)

Q_2 = 1500 units (quantity after change)

P_1 = Rs. 100 (price before change)

P_2 = Rs. 50 (price after change)

$$E_{dp} = \frac{(1500 - 1000)/1000}{(50 - 100)/100} = 1.0$$

Since E_{dp} is 1, it means that for a 50 percent fall in price, there is an increase in demand by 50 percent. Where the numerical value of elasticity is equal to one, the price demand is *unity elasticity*. In other words, the percentage of increase in quantity demanded is equal to the percentage of decrease in price.



Significance of price elasticity of demand It is necessary that the trader should be aware of the impact of changes in the quantity demanded for a given change in price. He can take a decision as to how much he can supply if he is aware of the likely change in quantity demanded as a result of change in price.

Box 3.3 Situation Analysis: Price Elasticity

In each situation, state whether demand is price elastic, price inelastic or unity elasticity.

- A 10% rise in the price of refrigerators leads to a 10% fall in quantity demanded.
- The quantity of cars demanded rises by 14% following a 5% fall in car prices.
- A 10% rise in the cinema ticket rate leads to a 5% fall in their quantity demanded.
- A 3% change in price of petrol leads to a 0.05% change in quantity demanded
- A 10% increase in the wages of construction workers
- A 20% increase in the deluxe interior fittings

(b) Income Elasticity of Demand Income elasticity of demand refers to the quantity demanded of a commodity in response to a given change in income of the consumer.

Income elasticity is normally positive, which indicates that the consumer tends to buy more and more with every increase in income.

It is measured as follows:

$$\text{Income elasticity of demand} = \frac{\text{Proportionate change in quantity demanded for product X}}{\text{Proportionate change in income}}$$

The same is expressed as

$$\text{Edi} = \frac{(Q_2 - Q_1)/Q_1}{(I_2 - I_1)/I_1}$$

Where Q_1 is the quantity demanded before change, Q_2 is quantity demanded after change
 I_1 is income before change and I_2 is the income after change.

A positive income elasticity indicates that the demand for the product rises more quickly than the rise in disposable income. In other words, the demand is more responsive to a change in income.

Example 4 Elastic income demand ($e > 1$):

Determine the Income elasticity of demand given that

- the quantity demanded for product M is 1000 units at a daily income of Rs. 100.
- the daily income declines to Rs. 80 and the quantity demanded decreases to 700 units.

Solution

$$\text{Edi} = \frac{(Q_2 - Q_1)/Q_1}{(I_2 - I_1)/I_1}$$

Let us define these variables here.

$Q_1 = 1000$ units (quantity before change)

$Q_2 = 700$ units (quantity after change)

$I_1 = \text{Rs. } 100$ (daily income before change)

$I_2 = \text{Rs. } 80$ (daily income after change)

$$\begin{aligned} \text{Edi} &= \frac{(700 - 1000)/1000}{(80 - 100)/100} \\ &= 1.5 \end{aligned}$$

Edi is 1.5, which means that for a 10 percent fall in income, there is a decrease in demand by 15 percent. Where the numerical value of elasticity is more than one, the price demand is *relatively elastic*. In other words, the percentage of decrease in quantity demanded is more than the percentage of fall in income. In times of depression, the incomes fall and consequently the demand for the goods and services also decrease.

Similarly the inelastic income demand and unity income demand can be determined.

Significance of income elasticity In determining the effects of changes in business activity, it is necessary for the trader to be aware of the income elasticity of demand for given commodities. With the help of income elasticity of demand, he can estimate the likely changes in the demand for his product as a result of changes in the national income. Income elasticity will help us in knowing whether a commodity is a superior good, normal good or an inferior good. If the income elasticity is positive and greater than one, it is a superior good. The superior goods such as automobiles and refrigerators can be advertised in business magazines for better attention from the consumers. Retail show rooms also can be located where high income group customers find it convenient to shop. If the income elasticity is positive and less than or equal to one, it is a normal good. If the income elasticity is negative, it is an inferior good. Knowledge of the nature of goods helps in allocating advertisement budget.

Box 3.4 Situation Analysis: Income Elasticity

In each situation, state whether income elasticity of demand is positive or negative. Explain the reason in each case.

- Salt
- Electricity
- Holidays in Singapore
- Colour Television
- Tubeless tyres (used in imported cars)

(c) Cross Elasticity of Demand Cross elasticity of demand refers to the quantity demanded of a commodity in response to a change in the price of a related good, which may be substitute or complement.

It is measured as follows:

$$\text{Cross elasticity of demand} = \frac{\text{Proportionate change in quantity demanded for product X}}{\text{Proportionate change in price of product Y}}$$

The same is expressed as

$$E_{dc} = \frac{(Q_2 - Q_1)/Q_1}{(P_{2y} - P_{1y})/P_{1y}}$$

Where Q_1 is the quantity demanded before change, Q_2 is quantity demanded after change, P_{1y} is the price before change and P_{2y} is the price after change in the case of product Y .

Cross elasticity is always positive for substitutes (which means that the demand for tea goes up if there is an increase in the price of coffee) and negative for complements (which means that if there is an increase in the price of sugar, the demand for coffee tends to fall).

Example 5 Inelastic cross demand ($e < 1$):

Determine the cross elasticity of demand given that

- the quantity demanded for product M is 1000 units at a daily income of Rs. 100.
- the daily income declines to Rs. 80 and the quantity demanded decreases to 700 units.

Solution

$$E_{dc} = \frac{(Q_2 - Q_1)/Q_1}{(P_{2y} - P_{1y})/P_{1y}}$$

Let us define these variables here.

$Q_1 = 1000$ kg (quantity of coffee demanded before change)

$Q_2 = 1200$ kg (quantity of coffee demanded after change)

$P_{1y} = \text{Rs. } 20$ (price of sugar per kg. before change)

$P_{2y} = \text{Rs. } 30$ (price of sugar per kg after change)

$$\begin{aligned} E_{dp} &= \frac{(1200 - 1000)/1000}{(30 - 20)/20} \\ &= 0.4 \end{aligned}$$

Since E_{dp} is 0.4 it means that for a 10 percent increase in the price of sugar, there is an increase in demand by 4 percent. Where the numerical value of elasticity is less than one, the cross demand is *relatively inelastic*. In other words, the percentage increase in quantity demanded of coffee is less than the percentage increase in price of a related good say sugar. Sugar and coffee are complements. The increase in price of sugar has shown its impact on the demand for coffee by marginalising the percentage of increase.

Similarly, the elastic cross demand (where $e > 1$) and unity cross demand (where $e = 1$) can be determined.

Box 3.5 Situation Analysis: Cross Elasticity

In each situation, state whether the cross elasticity of demand is positive or negative:

- Rice and vegetables
- Car and scooters
- Computers and related software
- Bank loans and Number of industries

Significance of cross elasticity of demand Knowledge of cross elasticity of demand helps a firm to estimate the likely effect of pricing decisions of its traders dealing in related products on sales. It also helps in defining industry.

(d) Advertising Elasticity It refers to increase in the sales revenue because of change in the advertising expenditure. In other words, there is a direct relationship between the amount of money spent on advertising and its impact on sales. Advertising elasticity is always positive.

$$\text{Advertising elasticity} = \frac{\text{Proportionate change in quantity demanded for product X}}{\text{Proportionate change in advertisement costs}}$$

The same is expressed as

$$E_{da} = \frac{(Q_2 - Q_1)/Q_1}{(A_2 - A_1)/A_1}$$

Where Q_1 is the quantity demanded before change, Q_2 is quantity demanded after change A_1 is the amount spent on advertisement before change and A_2 is the amount spent on advertisement after change.

Box 3.6 Elasticity Concept: How Airlines Industry Benefits

The concept of elasticity of demand is useful to every businessman equality. The stakes in airlines industry are huge and hence this example highlights how risk is minimised by following elasticity concept.

Basic service remains the same, by providing some other related facilities, Airlines charges its customers differently.

For instance, it has two classes: Business class and Economy class.

Business Class passengers are assumed to have low elasticity and hence are charged relatively higher. Because of their tight schedule, they have a compulsion to travel at the earliest through for a higher fare.

Economy class passengers normally have high elasticity and hence are charged lower. They respond very sharply to price increases. They may even postpone to take advantages in the fare, if any. However, if the travel is urgent, one may even travel by Business class also.

It is common to find airlines offering special incentives to the frequent flyers such as special discounts for early bookings, group bookings, allowing more luggage, etc.

The advertising elasticity is said to be high when even a small percentage change in the advertising expenditure results in a large percentage of change in the level of quantity demanded or sales.

Example 6 Elastic advertising demand ($e > 1$):

Determine the advertising elasticity of demand given that

- the quantity demanded for product M is 1,00,000 units per day at a monthly advertising budget of Rs. 10,000
- the monthly advertising budget is slashed to Rs. 5,000; the quantity demanded will fall down to 30,000 units per day.

Solution

$$Eda = \frac{(Q_2 - Q_1)/Q_1}{(A_2 - A_1)/A_1}$$

Let us define these variables here.

Q_1 = 100000 units (quantity demanded before change)

Q_2 = 30,000 units (quantity demanded after change)

A_1 = Rs.10,000 (advertising budget before change)

A_2 = Rs.5,000 (advertising budget after change)

$$\begin{aligned} Eda &= \frac{(Q_2 - Q_1)/Q_1}{(A_2 - A_1)/A_1} \\ &= +1.4 \end{aligned}$$

Since Eda is +1.4 it means that for a 10 percent decrease in the advertising budget, there is a decrease in demand by 14 percent. Where the numerical value of elasticity is more than one, the advertising elasticity is *relatively elastic*. In other words, the percentage of decrease in advertising budget is less than the percentage of decrease in the quantity demanded.

Similarly the inelastic advertising demand (where $e < 1$) and unity elasticity of advertising (where $e = 1$) can be determined.

Significance of advertising elasticity of demand The advertising agencies richly depend on this concept to provide consultancy for their clients about the advertisement budgets for a given level of sales activity.

FACTORS GOVERNING ELASTICITY OF DEMAND

Elasticity is governed by a number of factors. Change in any one of these factors is likely to affect the elasticity of demand. The factors are:

(a) Nature of product Based on their nature, the products and services are classified into necessities, comforts and luxuries. Necessaries imply the absolute or basic necessities such as food, clothing, housing. Comforts refer to TV, refrigerator and so on. By luxuries, we mean sofa sets, marble flooring in a house and such others. The meaning and definition of these necessaries, luxuries and comforts change from person to person, time to time and place to place. For example, a scooter may be a comfort or luxury for a student but when he does a part-time job, it may be a necessity for him.

The nature of product has a significant impact on the elasticity of demand. For instance, if there is an increase in the price of rice, we still buy it because it is a necessity for us. This means that the demand is inelastic to price. Though there is an increase in price, we tend to buy the necessities such as petrol, diesel and so on. In other words, the demand does not fall because of increase in price. From this, we can say that the necessities have inelastic demand. For comforts and luxuries, the demand is relatively elastic. It means that any increase in the price of comforts or luxuries will lead to moderate to significant fall in their demand.

(b) Time frame The more the time available for the customer, the demand for a particular product may be elastic and vice versa. Take the case of vegetables. When you do not have time, you go to a nearby shop and buy whatever you want at the given price. Had you had little free time, you would have preferred to get the same from a vegetable market at lesser price.

- (c) **Degree of postponement** Where the product consumption can be postponed, the product is said to have elastic demand and where it cannot be postponed, it is said to have inelastic demand. The consumption of necessities cannot be postponed and hence they have inelastic demand.
- (d) **Number of alternative uses** If the number of alternative uses are more, the demand is said to be highly inelastic and vice versa. Take the case of power or electricity. It is used for a number of alternative uses such as running of machines in industries, offices, households, trains, and so on.
- (e) **Tastes and preferences of the consumer** Where the customer is particular about his taste and preferences, the product is said to be inelastic. For the customers who are particular or loyal to certain brands such as Colgate, Tata Tea, Annapurna Atta, and so on, price increases do not matter. They tend to buy that brand in spite of the price changes.
- (f) **Availability of close substitutes** Where there are a good number of close substitutes, the demand is said to be elastic and vice versa. For gold, there is no close and literal substitute and hence the demand for gold is inelastic. If coffee and tea are equally good for me, if there is an increase in price of coffee, I may tend to switch over to tea. But this may not hold good when I am particular about coffee only. I may be prepared to pay higher price for coffee.
- (g) **In case of complementaries or joint goods** In case of complementaries or goods having joint demand, the elasticity is comparatively low.
- (h) **Level of prices** If the price is very expensive (such as diamonds) or very cheap (such as salt), then the product is likely to have an inelastic demand. If the price is too high, a fall in it will not increase the demand much. Similarly, if the price is too low, a further fall in its price is not likely to result in more demand. The demand of the relatively poor people is more sensitive to price changes. In order to derive maximum satisfaction from their limited income, they try to plan their purchases in response to changes in prices. The rich may not bother about price changes.
- (i) **Availability of subsidies** Subsidy refers to money paid by a government or other public authority in order to help a company financially or to make something cheaper for the public. There is need for subsidies in case of goods with inelastic demand such as LPG, sugar, wheat and so on.
- (j) **Expectation of prices** Where people expect a fall in the price, the demand for the product is likely to be inelastic.
- (k) **Durability of the product** Where the product is durable in case of consumer durables such as TV, the demand is elastic. In the case of perishable goods such as milk, the demand is inelastic.
- (l) **Government policy** Where the government policy is liberal, the product is likely to have elastic demand and vice versa. Government, in the interest of the lower income group consumers, closely monitors the prices of certain products (such as, ration goods as sold in fair price shops are likely to have inelastic demand). Also, another example could be taxes. Government can raise tax collections with a little reduction in the tax rates.

Significance of Elasticity of Demand

The concept of elasticity is very useful to the producers and policy-makers alike. It is a very valuable tool to decide the extent of increase or decrease in price for a desired change in the quantity demanded for the products and services in the firm or the economy. The following are its applications:

- (a) to fix the prices of factors of production

- (b) to fix the prices of goods and services provided rendered
- (c) to formulate or revise government policies
- (d) to forecast demand
- (e) to plan the level of output and price

These are explained below:

(a) Prices of factors of production The factors of production are land, labour, capital organisation and technology. These have a cost. We have to pay rent, wages, interest, profits and price for these factors of production. Now, the question is how much do we have to pay for each of these factors. The elasticity here depends on the supply of each of the factors vis-a-vis the demand for each of them respectively. For instance, where the labour is organised and unionised, the labour is said to be inelastic. Similarly, in a village, demand for land may be elastic, whereas in the case of an industrial township, it is inelastic. A higher rent has to be paid for the facilities available there.

(b) Price fixation The manufacturer can decide the amount of price that can be fixed for his product based on the concept of elasticity. If there is no competition, in other words, in the case of a monopoly, the manufacturer is free to fix his price as long as it does not attract the attention of the government. Where there are close substitutes, the product is such that its consumption can be postponed, it cannot be put to alternative uses and so on, then the price of the product cannot be fixed very high.

(c) Government policies

- (i) *Tax policies* Government extensively depends on this concept to finalise its policies relating to taxes and revenues. Where the product is such that the people cannot postpone its consumption, the government tends to increase its price, such as petrol and diesel, cigarettes, and so on. The finance minister uses elasticity concept to identify the various products and services where the taxes can be levied, and where relief can be extended to bring about the desired changes in the production, consumption, savings or investments.
- (ii) *Raising bank deposits* If the government wants to mobilise larger deposits from the customers, it proposes to raise the rates of fixed deposits marginally and vice versa.
- (iii) *Public utilities* Government uses the concept of elasticity in fixing charges for the public utilities such as electricity tariff, water charges, ticket fare in case of road or rail transport and so on.
- (iv) *Revaluation or devaluation of currencies* The government has to study the impact of revaluation or devaluation on the interests of the exporters and importers.
- (v) *Formulate government policy* If the product is such that the demand is inelastic, the government would like to exercise close control over the matters relating to its supply and demand.

(d) Forecasting demand Income elasticity is used to forecast demand for a particular product or service. The demand for the products can be forecast at a given income level. The trader can estimate the quantity of goods to be sold at different income levels to realise the targeted revenue. In other words, the impact of changing income levels on the demand of the product can be assessed with the help of income elasticity.

(e) Planning the levels of output and price The knowledge of price elasticity is very useful to producers. The producer can evaluate whether a change in price will bring in adequate revenue or not. In general, for items whose demand is elastic, it would benefit him to charge relatively low prices. On the other hand,

if the demand for the product is inelastic, a little higher price may be helpful to him to get huge profits without losing sales.

To sum up, elasticity is an equally valuable tool for the producer, trader and policy-makers.

Point Elasticity and Arc Elasticity

A demand curve does not have the same elasticity throughout its entire length. In general, elasticity differs at different points on a given demand curve. However, this does not hold good in the following three cases: a) perfectly elastic b) perfectly inelastic and c) unity elasticity. The demand curves in each of these cases possess a single elasticity throughout its entire length. Figure 3.2 shows the changing elasticity at different points of a demand curve.

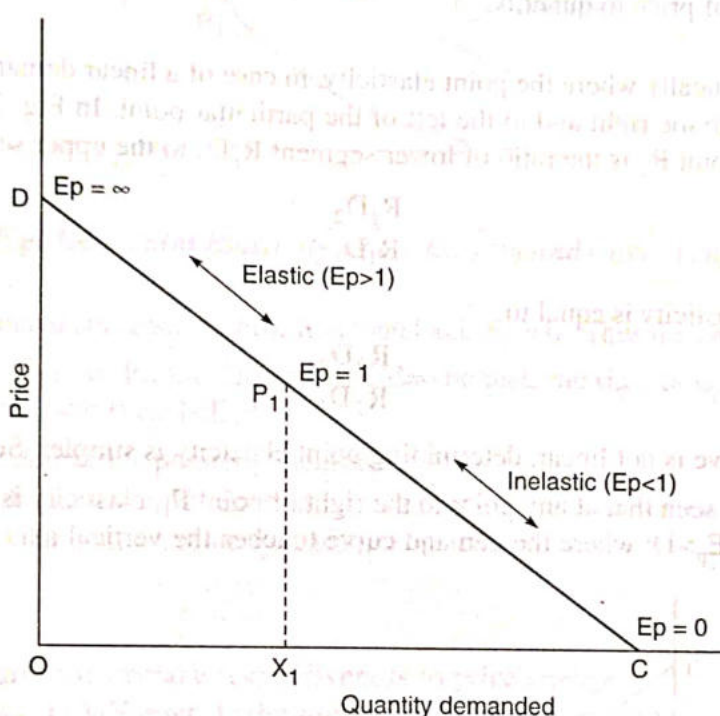


Fig. 3.2 Elasticity Changing at Different Points of the Demand Curve

From Fig. 3.2, it can be seen that elasticity at Point C where the demand curve meets the quantity axis is equal to zero, and elasticity at point D where the demand curve meets the price axis is equal to infinity. If P_1 is the mid-point of DC, elasticity at P_1 is equal to 1. At all the points between P_1 and C, the elasticity is greater than zero but less than unity and at the points between P_1 and D elasticity is greater than unity but less than infinity. At point D, elasticity is equal to ∞ . Thus the range of values of elasticity is between zero and infinity which means:

$$0 \geq e \leq \infty$$

The elasticity computed at a single point on the demand curve for an infinitesimal change in price is called 'point' elasticity. The elasticity between two separate points of demand curve is called 'arc' elasticity. Point elasticity is more precise than arc elasticity concept.

The point elasticity is defined as the proportionate change in quantity demanded resulting from a very small change in price of that commodity. It is expressed as

$$\text{Point } E_p = - \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

Point elasticity can be calculated with the help of Differential Calculus.

$E_d = \frac{dQ}{dP} \cdot \frac{P}{Q}$ where E_d is point price elasticity of demand, $\frac{dQ}{dP}$ is first order derivative of demand equation, $\frac{P}{Q}$ is the ratio of price to quantity.

Figure 3.3 shows graphically where the point elasticity, in case of a linear demand curve, is the ratio of the segments of the line to the right and to the left of the particular point. In Fig. 3.3 the elasticity of the linear demand curve at point R_1 is the ratio of lower segment R_1D_2 to the upper segment R_1D_1 that is,

$$\frac{R_1D_2}{R_1D_1}$$

And at point R_2 , the elasticity is equal to

$$= \frac{R_2D_2}{R_2D_1}$$

Where the demand curve is not linear, determining point elasticity is simpler. See Fig. 3.4.

From Fig. 3.4 it can be seen that at any point to the right of point P_1 , elasticity is less than unity ($E_p < 1$), and any point to its left ($E_p > 1$); where the demand curve touches the vertical axis $E_p \rightarrow \infty$

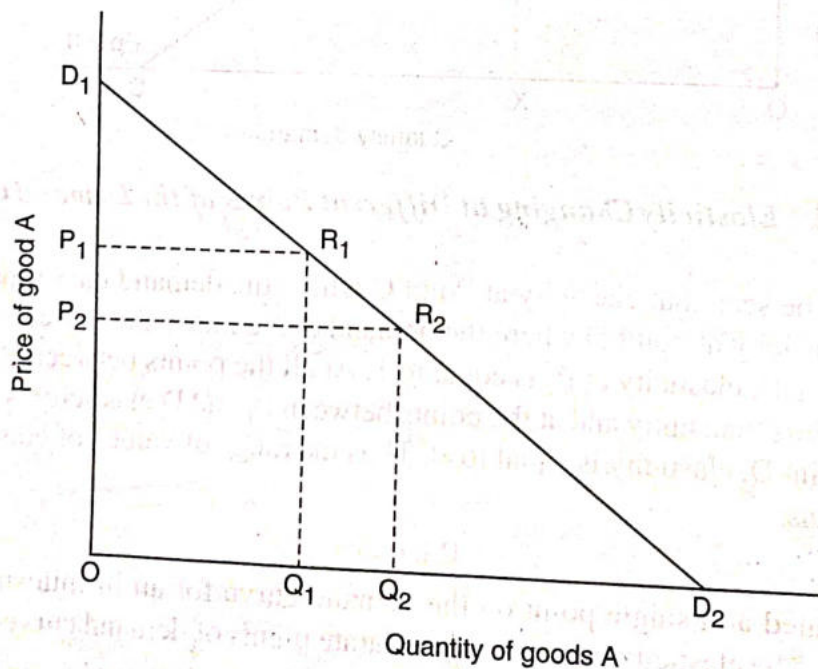


Fig. 3.3 Point Elasticity where the Demand Curve is Linear

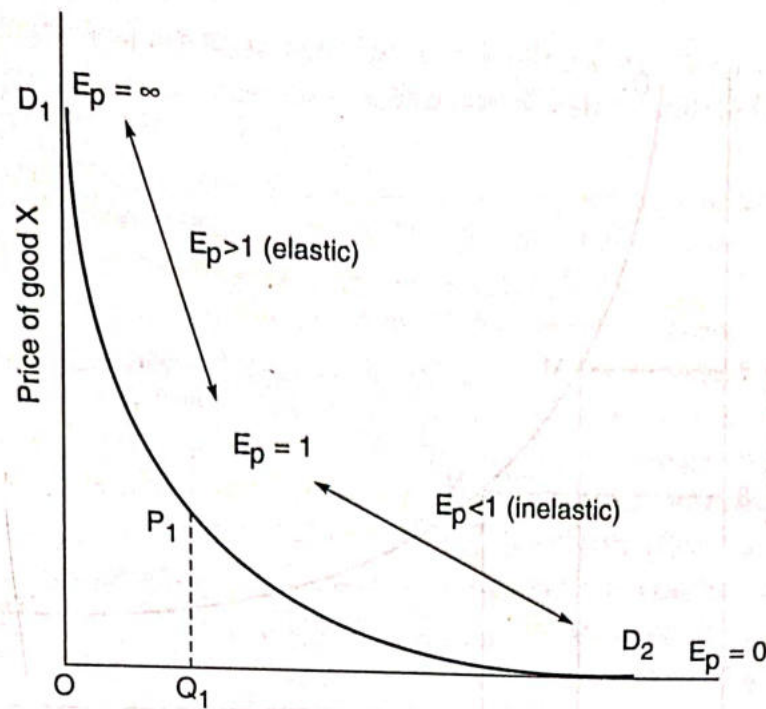


Fig. 3.4 Point Elasticity where the Demand Curve is not Linear

And where the demand curve touches the horizontal axis $E_p = 0$. Thus the range of values of elasticity are $0 \leq E_p \leq \infty$. To the right of P_1 , the demand is said to be inelastic (i.e., $0 < E_p < 1$) and to the left of P_1 , the demand is said to be elastic (i.e., $1 < E_p < \infty$)

Where $E_p = 0$, the demand is perfectly inelastic

Where $E_p = 1$ the demand is unity elasticity

Where $E_p = \infty$, the demand is perfectly elastic.

Arc Elasticity

Arc elasticity measures the average responsiveness to price change over a finite stretch on the demand curve. See Fig. 3.5 where MN refers to the stretch on the demand curve D_1D_2 , it is not clear whether Point M or Point N should be considered to determine elasticity. It makes a difference from which point we start. Moving from point M to N is different from N to M. It is because the percentage changes in quantity and price is different, depending upon the price and quantity from which it is taken. The difference in the starting point reveals the different values of elasticity coefficients.

If we move from M to N, we get

$$E_p = \frac{\Delta Q}{\Delta P} \cdot \frac{P}{Q} = \left(\frac{100}{3} \right) \cdot \left(\frac{6}{400} \right) = 0.5$$

If we move from N to M, we get

$$E_p = \frac{\Delta Q}{\Delta P} \cdot \frac{P}{Q} = \left(\frac{100}{3} \right) \cdot \left(\frac{3}{500} \right) = 0.2$$

Now take the average of the two end values $(0.5 + 0.2)/2 = 0.35$

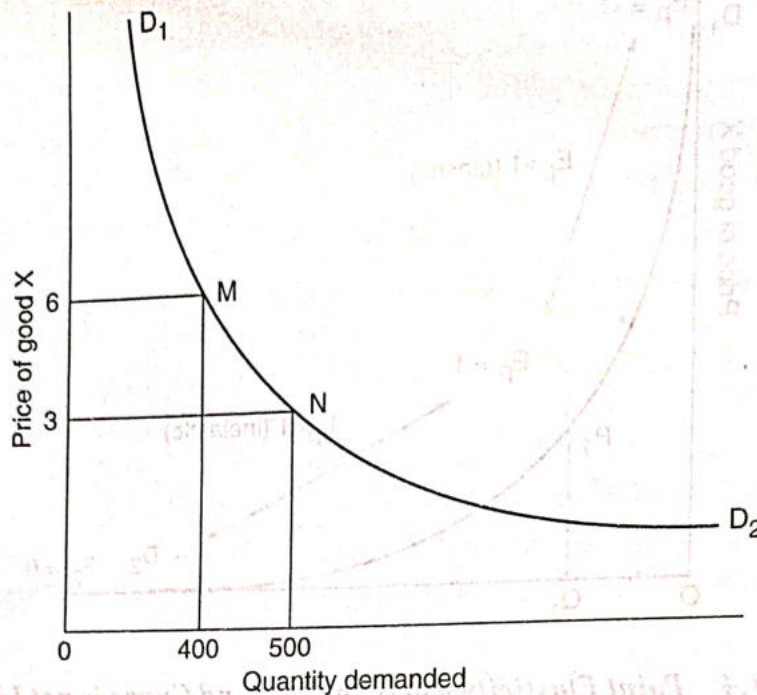


Fig. 3.5 Arc Elasticity

Which means it is the price demand that is inelastic

The arc elasticity is defined as below:

$$\text{ArcEp} = \frac{\Delta Q}{\Delta P} \frac{(P_1 + P_2)/2}{(Q_1 + Q_2)/2} = \frac{\Delta Q}{\Delta P} \frac{(P_1 + P_2)}{(Q_1 + Q_2)}$$

Where P_1 and P_2 are prices before and after changes, Q_1 and Q_2 are quantities demanded before and after changes respectively. ΔQ and ΔP refer to change in the quantity demanded and change in the price respectively. To make the arc elasticity more meaningful, compute between the points on the demand curve that are close enough.

To conclude, elasticity of demand is a very important concept for decision makers whether it is a finance minister or a monopolist. The concept of elasticity of demand helps to measure the changes in the quantity demanded in relation to changes in income or price and analyse how price or income can be a decisive factor to bring desired change in the quantity demanded.

CHAPTER SUMMARY

- Elasticity of demand refers to the rate of responsiveness in the demand of a commodity for a given change in price or any other determinants of demand.
- Elasticity of demand may be of four types: (a) price elasticity of demand, (b) income elasticity of demand, (c) cross elasticity of demand, (d) advertising elasticity of demand.
- Elasticity of demand can be measured as (a) Perfectly elastic demand, (b) Perfectly inelastic demand, (c) Unity elasticity, (d) Relatively elastic demand and, (e) Relatively inelastic demand.



DEMAND FORECASTING

Learning Objectives

After completing this chapter, you should be able to understand

- the need for forecasting demand
- factors affecting demand forecasting
- demand forecasting methods
- evaluation of each of these methods

INTRODUCTION

It is necessary to measure demand accurately in terms of quantity and its value for several purposes. Forecasting helps to assess the likely demand for products and services and to plan production accordingly. Demand forecasting is helpful not only at the firm level but also at the national level. There have been instances where the government had to spend excessively on imports just because the demand for certain goods had not been forecast in a scientific manner.

THE NEED FOR DEMAND FORECASTING

It is customary in all advanced countries to estimate demand for goods and services in a realistic manner so as to carry out the production plans. The importance of demand forecasting is paramount when either production or demand is uncertain. Where the supply is not in accordance with the demand, it results in the development of a black market or excessive prices. In populous countries such as India, in addition to demand forecasting, supply management is also critical. The results of demand forecasting guide the entrepreneurs to set up their business/industrial activities accordingly. The macro policies such as export/import and fiscal policies can be designed based on the results of demand forecasting.

Where there is a lot of competition, the entrepreneur has to estimate the demand for his products and services so that he can plan his material inputs, such as manpower, finances, advertising and other overheads. In India, the services of the National Council of Applied Economic Research (NCAER) are

very valuable in terms of demand estimates. NCAER estimates the probable demand for both industrial and consumer goods at the national and the regional levels. These estimates guide the entrepreneurs to plan their production.

FACTORS GOVERNING DEMAND FORECASTING

There are several factors which govern the forecasting process. These are:

Functional Nature of Demand

Market demand for a particular product or service is not a single number but it is a function of a number of factors. For instance, higher volumes of sales can be realised with higher levels of advertising or promotion efforts. However, there could be some minimum volume of sales even when there is no advertising on a large scale.

Types of Forecasts

Based on the period under forecast, the demand forecast can be of two types: (a) short-run forecasts and (b) long-run forecasts. Short-run forecasts cover a period of one year whereas long-run forecasts cover any period ranging from one year to 20 years. Short-run forecasts help to foresee the fluctuations in the demand based on seasonal and cultural factors such as festivals and so on, and plan the schedules of production or supply accordingly. In other words, short-run forecasts facilitate decisions by which the utilisation of resources can be optimised. The annual requirements of inventory can be procured at competitive prices. In the light of the short-run forecasts, the trader can formulate an appropriate pricing policy in tune with the seasonal fluctuations. The performance of the sales force can be monitored with necessary incentives very closely if short-run forecasts are available.

A short-range forecast of the total demand for a particular product helps to provide a basis for ordering raw materials, to plan and schedule production activities, to seek short-term finances, and so on.

A long-run forecast provides information for major strategic decisions that result in extension or reduction of limiting resources. A long-run forecast can be an effective basis to make an application for necessary long-term finance. It provides an appropriate basis to recruit human resources with a required specialisation. A long range forecast of regional demand for its major product line helps to provide a basis for considering market expansion.

Forecasting Level

The forecasting may be at the *firm level*, *industry level*, *national level* or at the *global level*. Forecasting at the firm level means estimating the demand for the products and services offered by a single firm. The aggregate demand estimated for the goods and services of all the firms constitutes the industry level forecast. The total estimate of different trade associations can also be viewed as industry level forecast. National level forecast is for the whole economy. National level forecasts are worked out based on the levels of income, savings of the consumers. It is essential to consider the appropriate indices of industrial production to work out national forecasts. With globalisation and deregulation, the entrepreneurs have started exploring the foreign markets for which the global level forecasts are utilised.

Degree of Orientation

Demand forecasts can be worked out based on total sales or product/service-wise sales for a given time period. Forecasts in terms of total sales can be viewed as *general forecast* whereas product/service-wise or region or customer segment-wise forecast is referred to as *specific forecast*.

Established or New Products

It is relatively easy to forecast demand for established products or products which are currently in use. If a firm wants to deal in detergents, it can find access to the industry demand for the detergents and market share of each competitor. It is upto this individual new firm and its ingenuity to create its own customer base by pulling customers of the other competitors through strategy. This type of database is not readily available in case of new products. Every product, till it is introduced in a given market, is a new product. Internet, WAP-enabled mobile phones and so on are relatively new products into the market at least in some of the developing countries. Even today, there are a number of villages where there is no power supply, and hence, facilities like TV for instance, are not available.

Technological development in certain countries is relatively advanced and this facilitates forecasting. If the product is introduced in any part of the world, there is some basis to gauge how customers react to such products. But, how to estimate demand for a new or innovative product? Providing sight-seeing trip into cosmos on a commercial basis could be cited as one example for a new product or service. In this case, the market segment would consist of only such customers who are substantially rich and passionate for such travel. However, it is relatively very difficult to forecast demand for new products. It is because there is paucity of information about the customer base. The firm has to spend a lot of research on its likely clientele to know the consumption pattern. The utility of the new products, more often, could throw light on its likely demand.

Joel Dean suggested a number of possible approaches to forecasting demand for new products. These are outlined below:

- (a) find out the demand for a related existing product and project the demand for the new product as its outgrowth
- (b) the new product in consideration can be analysed as a substitute for some existing product
- (c) assess the pattern of growth of established products and estimate, on this basis, the rate of growth and the likely level of demand for the new product over a given period.
- (d) assess the demand through a sampled or total survey of consumers' intentions over the new product features and price
- (e) offer the product for sale in a limited market and test the results. If the results are good, offer the same in wider market. Where the results are not satisfactory, find out the reasons for the poor sales and work on the product again to ensure wider acceptance.
- (f) contact the dealers to know the customers' reactions to the new product.

It is not necessary that all the above alternatives should be tried independently. More than one alternative can be pursued simultaneously. For instance, the product can be tried in the limited market and the reactions of the sales force can be simultaneously studied.

Nature of Goods

The goods are classified into producer goods, consumer goods, consumer durables and services. The patterns of forecasting in each of these differ.

Degree of Competition

There may be a single trader or a few traders depending upon the nature of goods and services.

Box 4.1 How New Products are Planned and their Turnover Estimated

Amul is the brand name owned by Gujarat Cooperative Milk Marketing Federation, the cooperative of 21 lakh farmers.

Present product range: Ice creams, cheese, butter, packed milk, chocolates, gulab jamun mix, yoghurt and shrikhand.

Just Launched: Pizza, soft cone ice cream, chocolate eclairs

Ready to launch: Frozen foods, stuffed parathas, paneer pakoras, tea and coffee (both filter and instant), matar paneer and pizzas.

Present turnover (2000–1) Rs 2,258 crore

Targeted turnover (2003–4) Rs 4,400 crore

(2006–7) Rs 10,000 crore

The new products will contribute 25 percent of the targeted turnover.

Other Factors

Every forecast of demand should clearly list the assumptions made about the demographic, economic, technological, political and cultural environment. In other words, there are certain other factors such as political developments, changing fashions and customer preferences, changes in technology, changes in the price level or inflation and so on, and these are critical factors which govern demand forecasting. For instance, if a government is committed to information technology, the demand for PCs can be foreseen. This demand pattern undergoes a drastic change in case there is change in the government. The philosophy and priorities of the new government may be totally different.

Market Demand

Market demand for a particular product is the total volume that would be bought by a defined customer group in a marked geographical area in a certain marketing programme.

Market demand is affected by a host of controllable factors such as the demographic, economic, technological, political and cultural environment, as well as elasticity with respect to industry price, promotion, product improvements and distribution efforts at given industry prices and marketing outlays.

Functional Nature of Market Demand

Market demand is a function of many variables out of which marketing effort is prominent. Figure 4.1 explains the functional nature of market demand. The curve shown market forecast here refers to the

market demand function that rises with higher levels of industry marketing effort. In other words, a change in industry marketing effort will bring forth a change in the curve also. There could be a minimum amount of sales even when there is no significant marketing expenditure by the industry.

Figure 4.1 reveals that the returns increase initially for every increase in the market expenditure. But this is not eternal. This is only up to a particular level. Beyond this level, the returns decrease. In other words, higher marketing expenditure would not necessarily stimulate further demand. This implies an upper limit to market demand called the market potential or maximum possible level of demand.

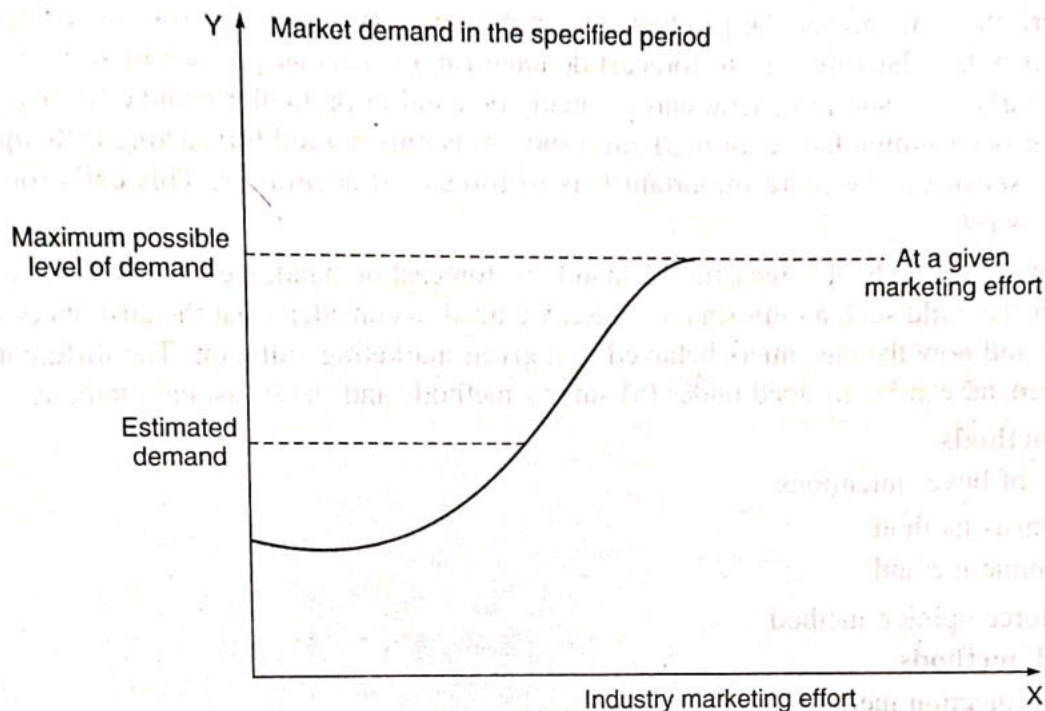


Fig. 4.1 Market Demand as a Function of Industry Marketing Effort

The curve also reflects alternative forecasts of market demand associated with alternative levels of industry marketing effort. What is shown in the curve is only one of the many possible levels of industry marketing effort that will actually occur. The market demand for a given marketing effort is called the *estimated demand*. It is the expected level of market demand for an expected level of industry marketing effort in a given environment.

What Constitutes a Scientific Approach to Forecasting?

The following steps constitute a scientific approach to demand forecasting:

- (a) Identify and state the objectives of forecasting clearly
- (b) Select appropriate method of forecasting, in the light of (a)
- (c) Identify the variables affecting the demand for the given product or service
- (d) Express these variables in appropriate forms
- (e) Collect the relevant data to represent the variables
- (f) Determine the most probable relationship between the dependent variable and independent variable, using the appropriate statistical techniques.

- (g) Make appropriate assumptions to forecast and interpret results in terms of market share, turnover in terms of value and volume, product groups, individual products, sizes and brands of each individual products and so on.
- (h) Let there be alternative forecasts to make the forecasting exercise more meaningful.

METHODS OF DEMAND FORECASTING

Forecasting demand is not an easy exercise. It may be easy only in the case of a very few products or services, where the demand for the product does not change from time to time or competition is not significant, it may be relatively easy to forecast demand for a particular product or service. In a majority of the cases, market demand in general and company demand in particular change from year to year. In such a case, the determining factor for marketing success is only a good forecasting technique. The more the demand is sensitive, the more important it is to forecast it accurately. This calls for an elaborate forecasting process.

There are many methods of forecasting demand. To forecast demand, we need to build a certain base of information. To build such an information base, we need to consider what the customers say, what the customers do, and how the customers behaved in a given marketing situation. The different methods of forecasting demand can be grouped under (a) survey methods and (b) statistical methods.

1. Survey methods

(a) Survey of buyer intentions

- Census method
- Sample method

(b) Sales force opinion method

2. Statistical methods

(a) Trend projection method

- Trend line by observation
- Least square method
- Time series analysis
- Moving averages method
- Exponential smoothing

(b) Barometric techniques

(c) Simultaneous equations method

(d) Correlation and regression methods

3. Other methods

(a) Expert opinion method

(b) Test marketing

(c) Controlled experiments

(d) Judgemental approach

1. Survey Methods

(a) Survey of Buyers' Intentions To anticipate what buyers are likely to do under a given set of circumstances, a most useful source of information would be the buyers themselves. It is better to

draw a list of all potential buyers, approach each buyer to ask how much does he plans to buy of the given product at a given point of time under particular conditions. This is the most effective method because the buyer is the ultimate decision-maker and we are collecting the information directly from him.

The survey of buyers can be conducted either by covering the whole population* or by selecting a sample group of buyers. Suppose there are 10,000 buyers for a particular product. If the company wishes to elicit the opinion of all the buyers, this method is called *census method* or *total enumeration method*. This method is not only time-consuming, but also costly. On the other hand, the firm can select a group of buyers who can represent the whole population. This method is called the *sample method*. A survey of buyers based on sample basis can be completed faster with relatively lower costs.

There are professional organisations specialised in market research on behalf of the firms who wish to forecast the demand for their products and/or services. Normally, a questionnaire is designed to elicit the information. The data thus collected forms the information base to design the consumer profiles. These consumer profiles guide the firms to identify the factors that influence demand. Also they may enable the firms to strengthen their weak areas of operation and to refocus their marketing strategy. Specialised organisation such as the ORG-Marg, and others conduct consumer surveys on large scale and offer necessary market intelligence.

Surveys of this nature focus directly on the consumer requirements and their behaviour. They look more simple and easy to be administered when compared to other statistical techniques such as trend analysis and econometric methods such as regression analysis.

The survey method is considered more *advantageous* in the following situations.

- (i) where the product is new on the market for which no data previously exists
- (ii) when the buyers are few and they are accessible
- (iii) when the cost of reaching them is not significant
- (iv) when the consumers stick to their intentions
- (v) when they are willing to disclose what they intend to do.

This method has certain *disadvantages* also. They are:

- (i) *Surveys may be expensive* Quite often the value of information supplied by the customer is not worth the cost of gathering it.
- (ii) *Sample size and timing of survey* Sample size should be large enough to yield meaningful results on the desired aspects of study. Also the sample should be selected in such a way that it represent the whole population under the study. This increases the cost and also the time needed to undertake the analysis. The forecast results can deeply be influenced by the timing of the survey. For example, the number of residents preferring to stay in multi-storied apartments soon after the news about an earthquake may drastically come down when compared to the normal times.

Where the surveys are conducted by a group of firms, these costs can be shared.

- (iii) *Methods of sampling* The survey should be based on appropriate method of sampling. The method so selected should be capable of providing results with no bias. For instance, the surveys conducted on the internet will have an built-in bias towards those in the higher socio-economic groups who have access to internet.
- (iv) *Inconsistent buying behaviour* The buyers also may not express their intentions freely. Even the buyers do not act upon the way they express. Most of the buyers are susceptible to the advertise-

* Population here refers to the total number of buyers for a product or service. It does not refer to the country's population.

ment strategies and are emotional when it really comes to the question of buying the product or service.

(b) Sales Force Opinions Another source of getting reliable information about the possible level of sales or demand for a given product or service is the group of people who sell the same. Thus, we can control the limitations of cost and delays in contacting the customers.

The sales people are those who are in constant touch with the main and large buyers of a particular market, and hence they constitute another valid source of information about the likely sales of a product. The sales force is capable of assessing the likely reactions of the customers of their territories quickly, given the company's marketing strategy. It is less costly as the survey can be conducted instantaneously through telephone, fax or video-conferencing, and so on. The data, thus collected, forms another valid source of reliable information.

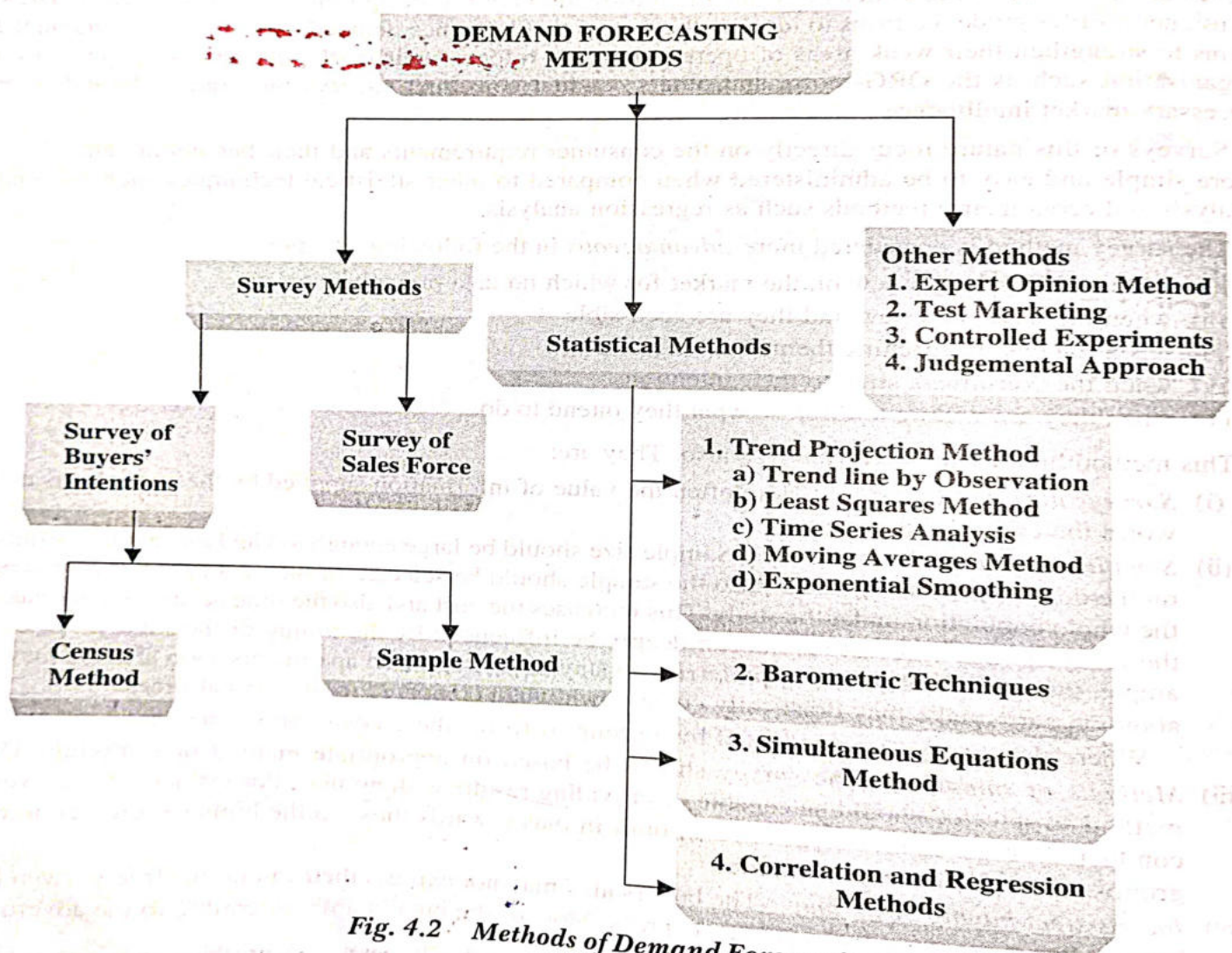


Fig. 4.2 Methods of Demand Forecasting

Here also, there is a danger that salesmen may sometimes become biased in their views. The sales people are paid based on their results. Where the targets are set based on the results of the survey of the sales force, and the payment is linked to achievement of these targets, incentive is paid to those who achieve more than their targets. To prevent the company from fixing higher targets, it is quite likely that they understate or overstate the demand to eventually get low or high sales quota set for them.

This method is appropriate when

- sales persons are likely to be most knowledgeable sources of information
- the salesmen are cooperative
- bias factor can be corrected by means of growth factor. Where the company finds that the sales position is forecast lower, it may correct it by adding to it the estimated difference.

In all, the results obtained through this method are questionable in terms of reliability. Hence the advantages of speed and cost associated with this method are not really very significant.

2. Statistical Methods

For forecasting the demand for goods and services in the long-run, statistical and mathematical methods are used considering the past data.

(a) Trend Projection Methods These are generally based on analysis of past sales patterns. These methods dispense with the need for costly market research because the necessary information is often already available in company files in terms of different time periods, that is, a time series data. There are five main techniques of mechanical extrapolation. In extrapolation, it is assumed that existing trend will maintain all through.

(i) Trend line by observation This method of forecasting trend is elementary, easy and quick as it involves merely the plotting the actual sales data on a chart and then estimating just by observation where the trend line lies. The line can be extended towards a future period and corresponding sales forecast read from the graph.

(ii) Least Squares Method Certain statistical formulae are used here to find the trend line which 'best fits' the available data. The trend line is the basis to extrapolate the line for future demand for the given product or service on graph. Here it is assumed that there is a proportional (linear) change in sales over a period of time. In such a case, the trend line equation is in linear form. Where this assumption does not hold good, the equation can be in non-linear form.

The estimating linear trend equation of sales is written as:

or

$$S = x + y(T)$$

Where x and y have been calculated from past data S is sales and T is the year number for which the forecast is made. To find the values of x and y , the following normal equations have to be stated and solved:

$$\sum S = Nx + y \sum T$$

$$\sum ST = x \sum T + y \sum T^2$$

Where S is the sales; T is the year number, n = number of years



Example 1

Year	1996	1998	2000	2002	2004
Sales (Rs. in lakhs)	75	84	92	98	88

Estimate the sales for the years 2004 and 2006.

Solution

State and solve the normal equations to determine the values of x and y in the trend equation.

$$\sum S = Nx + y \sum T$$

$$\sum ST = x \sum T + y \sum T^2$$

Let us now determine the following:

$$\sum S, \sum ST, \sum T \text{ and } \sum T^2$$

Year	Year no. (T)	Sales (S) (Rs. in lakhs)	ST	T ²
1992	1	75	75	1
1994	3	84	252	9
1996	5	92	460	25
1998	7	98	686	49
2000	9	88	792	81
$\sum T = 25$		$\sum S = 437$	$\sum ST = 2265$	$\sum T^2 = 165$

By substituting the above values in the normal equations, we get

$$437 = 5x + 25y$$

$$2265 = 25x + 165y$$

By solving these equations, we get $x = 77.4$ and $y = 2$. Years 2004 and 2006 take on the year numbers 11 and 13 respectively.

By substituting these values in the trend equation $x + y(T)$

$$S_{2002} = 77.4 + 2(11)$$

$$= 99.4 \text{ lakh units.}$$

$$S_{2004} = 77.4 + 2(13)$$

$$= 103.4 \text{ lakh units.}$$

Thus the forecast sales for year 2004 and 2006 are 99.4 and 103.4 lakh units.

(iii) **Time series analysis** Where the surveys or market tests are costly and time-consuming, statistical and mathematical analysis of past sales data offers another method to prepare the forecasts, that is, time series analysis. One major requirement to administer this technique is that the product should have actively been traded in the market for quite sometime in the past. In other words, considerable data on the performance of the product or service over significantly large period should be available for better results under this method. Time series emerge from such a data when arranged chronologically. Given significantly large data, the cause and effect relationships can be discovered through quantitative analysis.

The following are the four major components analysed from time series while forecasting the demand:

Trend (T), also called the long-term trend, is the result of basic developments in the population, capital formation and technology. These developments relate to over a period of long time say five to ten years, not definitely overnight. The trend is considered statistically significant when it has reasonable degree of consistency. A significant trend is central and decisive factor considered while preparing a long-range forecast.

Cyclic Trend (C) is seen in the wave like movement of sales. The sales data is quite often affected by swings in the levels of general economic activity, which tend to be somewhat periodic. These could be related to the business cycles in the economy such as inflation or recession. For instance, during the period of inflation, prices of the products go up and hence the demand slows down.

Seasonal Trend (S) refers to a consistent pattern of sales movements within the year. More goods are sold during the festival seasons. The seasonal component may be related to weather factors, holidays, and so on.

Erratic Trend (E) results from the sporadic occurrence of strikes, riots, and so on. These erratic components can even damage the impact of more systematic components, and thus make the forecasting process much more complex.

Classical time series analysis involves procedures for decomposing the original sales series (Y) into the components T, C, S, I . There are different models in the time series analysis. While one model states that these components interact linearly, that is, $Y = T + C + S + E$, another model states that Y is the product of all these components that is, $Y = T \times C \times S \times E$.

A trend line is fitted by projecting the trend of the time series, through a series either by observation or by means of statistical techniques such as the method of least squares. Identify an algebraic relation (maybe in the form of linear, quadratic or logarithmic) depending upon the relationship between the dependent and independent variables to project the trend line into the future by extrapolation.

Compute the trend values from the original data and then eliminate them from the observed data ($TSCI/T$). After this, calculate the seasonal index to remove the seasonal effect (SCI/S). Thus, a cycle is fitted to the remainder which also contains an irregular effect.

This method yields significantly good results

- because it is simple and inexpensive
- because it considers the significantly large data which reflects a continuing growth trend
- where the underlying demand factors remain stable over time. Even if the demand factors might have changed, past data reflects the compounding effect of such changes
- decomposition of time series data is a useful technique for understanding the nature of business fluctuations.

The method fails to be relevant

- when there is a break-down in the trend projection as a result of a turning point or significant change in policies or procedures.
- when it is difficult to identify the turning points causing the changes in the trend. As long as there are no major changes in the policies and procedures, the management does not face significant challenge in its forecasting exercise. But in the event of a turning point, it is necessary to assess the

changes resulting as a result of changes in the policies. For instance, the Government of India continued its patronage in terms of financial assistance to the sick public sector units till 1999. In the year 2000, a decision has been taken by the government to disinvest the public enterprises. Such type of major and significant decision is going to affect the future of the public enterprises. Any attempt to project the trend in the flow of funds based on the past data, from Government to the sick public sector unit, is ridiculous.

- as this method calls for expert knowledge in the use of mathematics and statistics to forecast demand for a given product or service. In this method, past and future sales are treated as a function of time rather than of any real demand factors.
- the long-term trend and seasonal trends can be forecast but not the cyclical and irregular trends, and hence, it has limited utility in business forecasting.

(iv) **Moving average method** This method considers that the average of past events determine the future events. In other words, this method provides consistent results when the past events are consistent and unaffected by wide changes. As the name itself suggests, under this method, the average keeps on moving depending up on the number of years selected. Selection of the number of years is the decisive factor in this method. Moving averages get updated as new information flows in.

This method is easy to compute. One major advantage with this method is that the old data can be dispensed with, once the averages are computed. These averages, not the original data, are further used as the forecast for next period.

The main shortcoming of this method is that it gives equal weightage to data both in the recent past and the earlier one.

The following example illustrates the concept of moving averages method.

Example 2

Compute 3-day moving average from the following daily sales data.

Date and month	Daily sales (Lakhs of tonnes)	3-day Moving average
Jan.1	40	
2	44	
3	48	
4	45	44
5	53	45.7

Solution

To calculate 3-day moving average,

$$S_4 = \frac{40 + 44 + 48}{3} = 44$$

$$S_5 = \frac{44 + 48 + 45}{3} = 45.7$$

(v) **Exponential smoothing** This is a more popular technique used for short run forecasts. This method is an improvement over moving averages method. Unlike in moving averages method, all time periods

Similarly, predicted sales for year 7 can be worked out.

$$\begin{aligned}
 S_7 &= cS_6 + (1 - c) Sm_t \\
 &= 0.1 (5.1) + (1 - 0.1) 5.8875 \\
 &= 0.51 + (0.9) 5.8875 \\
 &= 0.51 + 5.298 \\
 &= 5.808
 \end{aligned}$$

Since this method involves more mathematical computation, computers can be advantageously used for better accuracy and quick results.

(b) Barometric Techniques Where forecasting based on time series analysis or extrapolation may not yield significant results, barometric techniques can be made use of. Under the barometric technique, one set of data is used to predict another set. In other words, to forecast demand for a particular product or service, use some other relevant indicator (which is known as a barometer) of future demand. How the statistical data relating to the economy comes handy for this purpose is explained in the following examples:

- To assess the demand for services in India and abroad, we can see the percentage of population in each occupation. In the US, 78-percent of the labour force is employed in services and 15 percent in manufacturing; in India, according to 1991 census, 21 percent of the workforce is engaged in services, 13 percent in manufacturing and 67 percent in agriculture. The world over, an increase in prosperity has been accompanied by an increase in demand for services.
- We can know how many jobs in a particular sector can be created, based on the estimated revenues from it over a period of time. A study conducted by the National Association of Software and Service Companies (NASSCOM) indicates that about 23,000 Indians are already generating \$225 million in revenues from such services. The NASSCOM estimates that these services could generate 1.1 million jobs and \$19 billion in revenues by 2008. These estimates may guide the policy-makers to initiate necessary measures to offer necessary courses in the universities, to change the course syllabus, and so on.
- What kind of occupations will continue to be relevant in the years to come? This can be assessed by looking into the percentage of the demand in the global market for each of the occupations. McKinsey & Co, one of the globally leading management consulting company, identified 11 white-collar services that can be performed off-shore with relative ease. The firm projects, by 2010, a global market of \$180 billion of such services including finance and accounting (\$20 billion); engineering and design (\$6 billion); data-search, integration and management (\$20 billion); distance education (\$19 billion); website services (\$7 billion); and customer interaction services (\$42 billion). These figures guide many entrepreneurs to plan their ventures accordingly.
- The demand for soft furnishings may also be linked to the number of new houses completed and sold.
- The demand for cable TV may be linked to the number of new houses occupied in a given area.

This technique has certain drawbacks also.

- It may be difficult to determine the time lag between the change in one variable and the change in the forecast variable. It can be expected that the consumer will buy a scooter when there is increase in the income level. But how long it will take for him, to pick up scooter after the increase in income? Is it a year or longer?

- Although it is possible to determine the direction of change, it is often difficult to predict the magnitude of the change in the forecast variable. For a given change in income level, what could be the increase in the number of scooters sold?

(c) Simultaneous Equation Method In this method, all variables are simultaneously considered, with the conviction that every variable influences the other variables in an economic environment. Hence, the set of equations equal the number of dependent (controllable) variable which is also called endogenous variables. In other words, it is a system of 'n' equations with 'n' unknowns. It can be solved, the moment the model is specified because it covers all the unknown variables, it is also called complete systems approach to demand forecasting.

Like two least squares, where regression of investment (I) is found on all the pre-determined variables such as government policy, competition, level of technology and so on, which are beyond the control of the management. These include the exogenous variables such as government policy and lagged endogenous variables such as S_{t-1} .

This method is more practical in the sense that it requires to estimate the future values of only predetermined variables. It is an improvement over regression method whereas in regression equation, the value of both exogenous and endogenous variables have to be predicted. It is no better than regression method. It inherits all the limitations of regression method.

It is difficult to compute where the number of equations is larger.

(d) Correlation and Regression Methods Correlation and regression methods are statistical techniques. Correlation describes the degree of association between two variables such as sales and advertisement expenditure. When the two variables tend to change together, then they are said to be correlated. The extent to which they are correlated is measured by correlation coefficient. Of these two variables, one is a dependent variable and the other is an independent. If the high values of one variable are associated with the high values of another, they are said to be positively correlated. For example, if the sales have gone up as a result of increase in advertisement expenditure, we can say that the sales and advertisement are positively correlated. Similarly, if the high values of one variable are associated with the low values of another, then they are said to be negatively correlated. For example, if the price of a product has come down; and as a result, there is increase in its demand, the demand and the price are negatively correlated. In other words, where the functional relationship is analysed with the independent variable, it is simple correlation. It is likely that there could be several independent variables, and in such a case, it is called multiple correlation. Correlation coefficient ranges between +1 and -1. It does not exceed this range. Where the correlation coefficient is zero, it indicates that the variables under study are not related at all.

In regression analysis, an equation is estimated which best fits in the sets of observations of dependent variables and independent variables. The best estimate of the true underlying relationship between these variables is thus generated. The dependent (unknown) variable is then forecast based on this estimated equation, for a given value of the independent (known) variable. The method of least squares is applied in most regressions. As the regression coefficients estimated from the sample observations are merely the best estimate of true population parameters, the regression equation cannot exactly predict the dependent variable for a given value of the independent variable. In cases of more than one independent variable having significant effect upon the dependent variable, multiple linear regression is employed.

The main advantage of this method is that it provides the values of independent variable from within the model itself. Thus it frees the forecaster from the difficulty of estimating them exogenously.

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The main advantage of this method is that it provides the values of independent variable from within the model itself. Thus it frees the forecaster from the difficulty of estimating them exogenously.

Other Methods

(a) Expert Opinion Well-informed persons are called experts. Experts constitute yet another source of information. These persons are generally the outside experts and they do not have any vested interests in the results of a particular survey.

An expert is good at forecasting and analysing the future trends in a given product or service at a given level of technology. The services of an expert could be advantageously used when a firm uses general economic forecasts or special industry forecasts prepared outside the firm. It may be easy to administer this method where there are parameters clearly defined to make forecasts. These act as guidelines.

This method also has certain advantages and disadvantages.

The main advantages of this method are:

- results of this method would be more reliable as the expert is unbiased, has no direct commercial involvement in its primary activities
- independent demand forecasts can be made relatively quickly and cheaply
- where there are different points of view among different experts, consensus can be arrived through an objective analysis. The experts can be asked to explain the reasons why the forecasts are out of line with the consensus. These can be taken into account before taking the final decisions. Sorting out the differences in the estimates in this way is called *Delphi Technique*.
- this method constitutes a valid strategy particularly in the case of new products, in respect of which there is no other alternative or source of information.

The main disadvantage is that an expert cannot be held accountable if his estimates are found incorrect.

(b) Test Marketing It is likely that opinions given by buyers, salesmen or other experts may be, at times, misleading. This is the reason why most of the manufacturers favour to test their product or service in a limited market as test-run before they launch their products nationwide. Based on the results of test marketing, valuable lessons can be learnt on how consumers react to the given product and necessary changes can be introduced to gain wider acceptability. To forecast the sales of a new product or the likely sales of an established product in a new channel of distribution or territory, it is customary to find test marketing in practice.

Automobile companies maintain a panel of consumers who give feedback on the style and design and specifications of the new models. Accordingly these companies make necessary changes, if any, and launch the product in the wider markets.

(In test marketing, the entire product and marketing programme is tried out for the first time in a small number of well-chosen and authentic sales environment. The primary objective, here, is to know whether the customer will accept the product in the present form or not.

If sales are not encouraging in the markets so tested, it is clear that the product has certain defects, which are to be looked into seriously. The company can work further to identify these defects, correct them and then test the product again, if necessary.)

One of the factors determining the success of the test marketing is the relevance of small market chosen. (A small market representing all the features of the wide market constitutes an ideal place to conduct test marketing for a given product or service.) In other words, it should be representative.

(Of late, test marketing is applied not only to marketing products and services, but also to film production. There are cases of reshooting certain parts of a major film based on the feedback from test marketing audience. This practice, though originating in Hollywood, has now spread to India also. For instance, where the ending of the film was not in line with the public opinion of selected audience, or the sense of humour was difficult to understand as evidenced by people laughing at wrong places, the producers chose to reshoot.)

The *advantages* of test marketing are:

- (a) the acceptability of the product can be judged in a limited market
- (b) before it is too late, the corrections can be made to the product design, if necessary. Thus, major catastrophe, in terms of failure, can be avoided.
- (c) the customer psychology is more focussed in this method and the product and services are aligned or redesigned accordingly to gain more customer acceptance.

The following are the *disadvantages* of this method:

- It reveals the quality of the product to the competitors before it is launched in the wider market. The competitors may bring about a similar product or often misuse the results of the test marketing against the given company.
- It is not always easy to select a representative audience or market.
- It may also be difficult to extrapolate the feedback received from such a test market, particularly where the chosen market is not fully representative.

(c) Controlled Experiments Controlled experiments refer to such exercises where some of the major determinants of demand are manipulated to suit to the customers with different tastes and preferences, income groups, and such others. It is further assumed that all other factors remain the same. In this method, the product is introduced with different packages, different prices in different markets or same markets to assess which combination appeals to the customer most. Regression equation can be built upon these price-quantity relationships of different markets. This method can not provide better results, unless these markets are homogeneous in terms of, tastes and preferences of the customers, their income and so on.

This method is used to gauge the effect of a change in some demand determinant like price, product design, advertisement, packaging, and so on.

This method is still in the infancy stage and not much tried because of the following reasons:

- It is costly and time consuming
- It involves elaborate process of studying different markets and different permutations and combinations that can push the product aggressively
- If it fails in one market, it may affect other markets also

(d) Judgemental Approach When none of the above methods are directly related to the given product or service, the management has no alternative other than using its own judgement. Even when the above methods are used, the forecasting process is supplemented with the factor of judgement for the following reasons:

- Historical data for significantly long period is not available
- Turning points in terms of policies or procedures or causal factors cannot be precisely determined

Unit - III

Production Analysis

- ✓ Production Functions ✓
- ✓ Law of variable Functions
- ✓ Isobars, Isoquants, Isocost
- ✓ Least cost combination
- Return to Scale - Economics of Scale
- ✓ Cobb-douglas's production ~~function~~ ✓
- Constant elasticity of substitution

Production Function :

Production means converting the raw materials or inputs into output of the organisation is consider as production.

production Function as "The function which defines maximum output of the organisation with using of minimum set of inputs."

→ Michael ~~φ~~R. Baye

(or)

production Function as "a Technical relationship which reveals the maximum output capable of being produced by each & every set of input."

$$\text{Production Function} = f[L_1, L_2, C, O, T]$$

$$Q = f[L_1, L_2, C, O, T]$$

where Q = Quantity of output product.

L_1 = Land

L_2 = Labour

C = Capital

O = Organisation

T = Technology

f = function, (relation b/w inputs & outputs)

NOTE:

In above production function, any positive change in inputs will leads to increasing the quantity of output of the organisation.

Types of production Functions:

1. Production function with one variable
2. Production function with two variables
3. Production function with multi variables

1. Production function with one variable: & Law of returns

The law of ~~return~~ states that when atleast one factor of production is fixed (or) factor input is fixed when all other factors are varied.

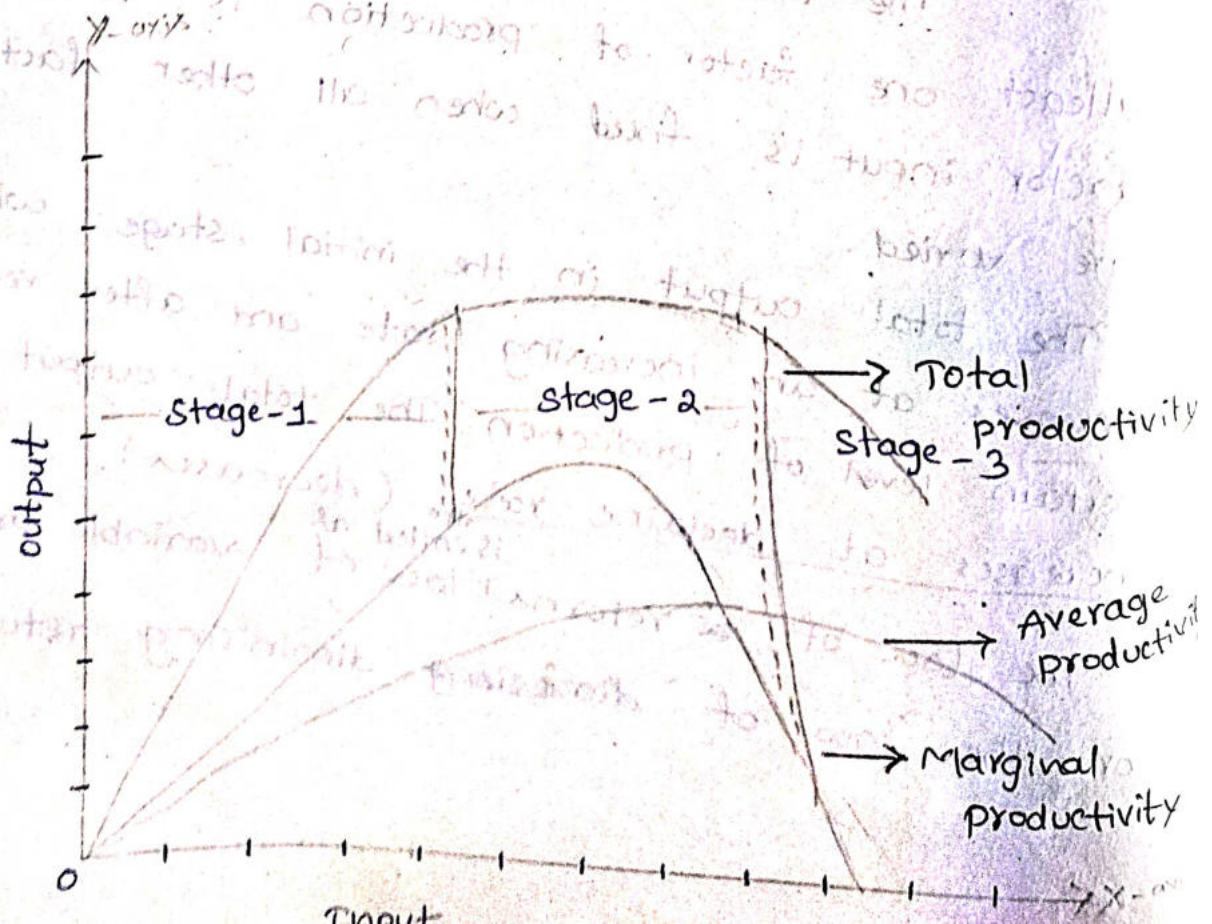
The total output in the initial stage will increase at an increasing rate and after reaching certain level of production, The total output will increase at decline rate (decreases).

The law of ~~return~~ is called as law of variable proportions or the law of diminishing returns.

S.NO.	Labour	Total productivity	Marginal productivity	Average productivity
1.	0	0	0	0
2.	10	10 (10-0)	10 ($\frac{0+10}{2}$)	5
3.	22	22 (22-10)	12 ($\frac{12+10}{2}$)	11
4.	33	33 (33-22)	11	11.5
5.	40	40 (40-33)	7	9
6.	5	45 (45-40)	5	6
7.	6	48 (48-45)	3	4
8.	7	45 (45-48)	-3	-0

NOTE: Assumption
 In the short run, it is assumed that Capital is fixed factor input and labour is variable input. It is also assumed that technology is given and it is not going to change.

Graphical Representation :



Stage - 1 $\rightarrow$ Increasing level rate of returns

Stage - 2 $\rightarrow$ constant level

Stage - 3 $\rightarrow$ Decreasing level

2. Production Function with Two Variable:

Production function with two variables consists of both Capital (C) & Labour (L) to produce a given output. There could be a more than two inputs in real life situations. But for simple analysis we restrict the number of inputs to two only.

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

where, Q = Quantity of output

C = Capital

L = Labour

Both Capital and Labour are required to produce a product

Isoquants:

Iso means equal, Quant means quantity

Isoquants means that quantities through out a given Isoquants are equal. Isoquant curves are also called as "Isoproduct curves".

An Isoquant curves shows various combination of two inputs such as capital and labour which

yields same level of outputs.

Different combination of inputs that gives same level of output.

As an Isoquant curve represents all such combinations

which yield same equal quantity of output, every

combination is a good combination, since all these

combinations equally, an isoquant curve is also

called 'product Indifference curve'.

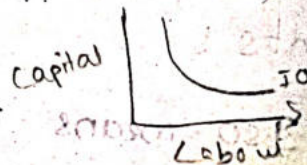
Combination	capital	Labour	output (unit)
A	1	20	40,000
B	2	15	40,000
C	3	11	40,000
D	4	8	40,000
E	5	6	40,000
F	6	5	40,000

The above table shows that different table factors inputs, which yields an output of 40,000 output

Features of Isoquants :

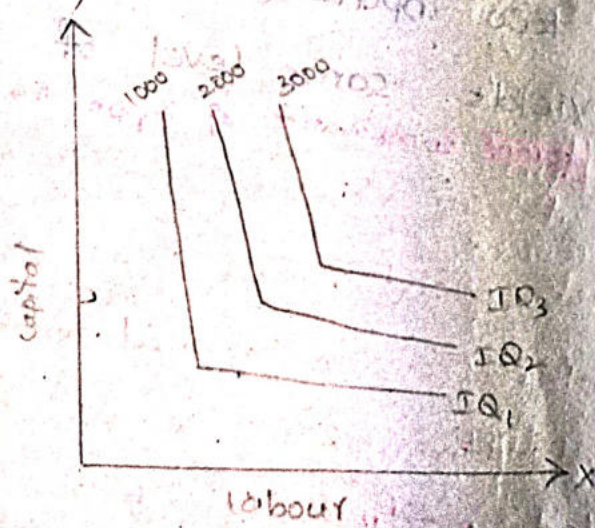
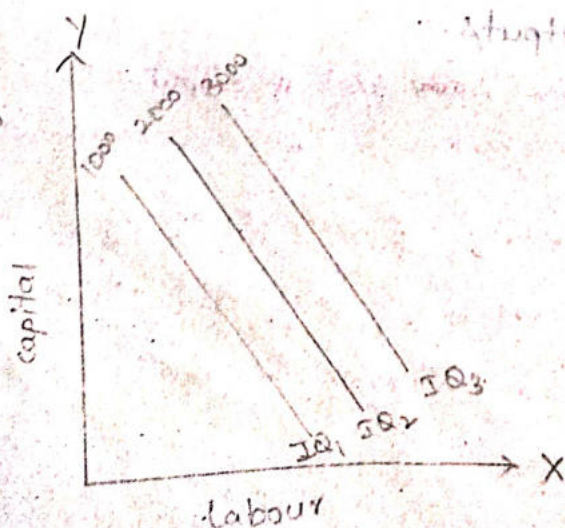
1. Downward sloping :

Isoquants are downward sloping because if one input increases, the other one is decreases. There is no question of increasing in both in capital and labour to yield a given output.



2. convex shape / convex origin :

Isoquants are convex to the origin. It is because the input factors are not a perfect substitutions. One input factor can be substituted by the another input factor at a decreasing marginal rate.



3. Don't touch the axes:

The Isoquants touches neither x-axis nor y-axis as both inputs are required to produce a given product

4. Donot Intersect:

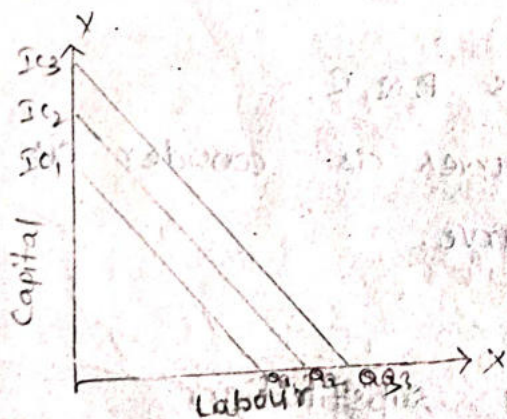
Two Isoquants donot intersect with each other because of each of these denotes a particular level of output.

Iso cost:

Iso means equal, Iso cost refers the combination of inputs that will cost the producer the same amount of money.

→ If the level of production changes total cost changes so that the Isocost curves moves upwards as well as downwards.

→ Isocost curves downwards sloping with straight line.

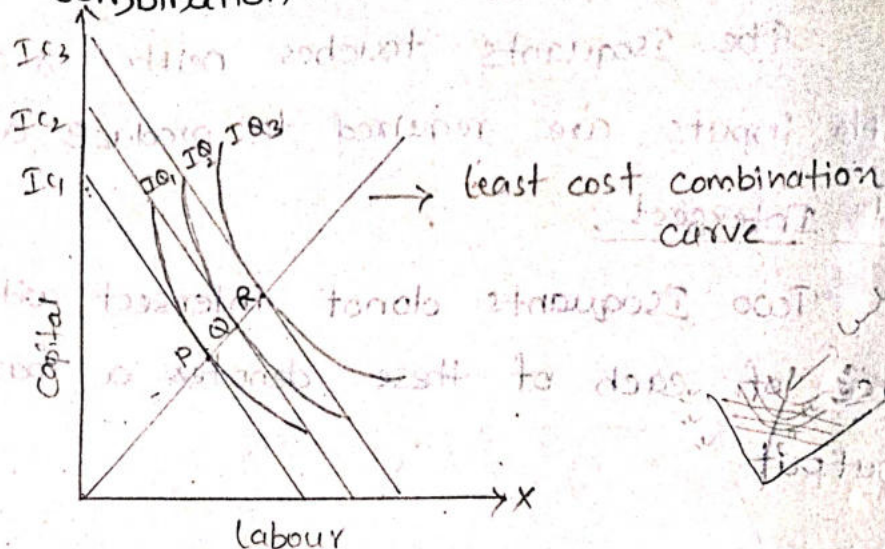


IC_1 = Iso cost curve 1

IC_2 = Iso cost curve 2

IC_3 = Iso cost curve 3

Least cost combination :



- 1) The manufacture has to produce at lower cost to attain higher profits.
- 2) The Isocost & Isoquants can be used to determine the input usage that minimize the cost of production.
- 3) where the slope of Isoquants equal to Isocost, there lies the lowest point of the cost of the production.
- 4) This can be observed by superimposing of Isocost and Isoquant curves
- 5) The points are identified as P, Q, R
- 6) The combination of all curves is consider as least cost combination curve.

MRTS :

Marginal Rate of Technical Substitution

Combination	Capital	Labour	MRTS
A	1	20	
B	2	15	$(20-15=5)$ 5:1
C	3	11	4:1
D	4	8	3:1
E	5	6	2:1
F	6	5	1:1

MRTS refers the rate at which one input factor is substituted with another to attain given level of output. In other words, lesser units of one input must be compensated by increasing amount of another input to produce the same level of output.

$$MRTS = \frac{\text{change in one input}}{\text{change in another input}} = \frac{\Delta K - \text{capital}}{\Delta L - \text{labour}}$$

In the above table, the ratio of MRTS between the two input factors Those are capital & labour. 5 units of decreasing in labour is compensated by increasing in 1 unit of capital.

So that, $MRTS = 5:1$

25/10/17

★ Cobb - Douglas production Function:

Cobb & Douglas ^{put forth a} production function ^{relating} relatively output in ^{American} manufacturing American Industries. It is derived in 1899 - 1922 to labour and capital inputs.

A/c to cobb - douglas production function

$$P = b \cdot L^a \cdot C^{1-a}$$

where, P = Cobb - Douglas production function output

b = production constant

L = The index of employment labours of the production

C = The index of the capital used in production

$a, 1-a$ = Are consider as elasticity changes in both capital & labour

After insert all values by American manufacturing industries. The function estimated by Cobb & Douglas

$$P = 1.01 \cdot L^{0.75} \cdot C^{0.25}$$

$$R^2 = 0.9409$$

where, R = Related coefficient values

The production function shows that one percent change in labour input at the time capital (c) constant is associated with 0.75% change in production output.

The production function shows that one percent change in capital input at the time labour (L) constant is associated with 0.25% change in production output.

The coefficient determination R^2 means that 94% variations on the dependent variable (p) were accounted for by the variations means both capital (c) & labour (L)

(Independent variable).

Returns to economics of scale:

After investment of the money in any organisation, for firms gets certain returns, returns may be positive or negative.

The positive result of the organisation should be considered as profits of the firm. It explains the behaviour of the returns when inputs are changed. It is also considered as Law of return to scale.

Classification of return to scale:

1. Law of Increasing return to scale:
2. Law of constant return to scale
3. Law of Decreasing return to scale

1. Law of Increasing return to scale:

capital	Labour	Percentage increase in capital	Percentage increase in Labour	output (Assumed)	% ↑ output
1	3	-	-	-	-
2	6	100	100	120	140 LIRS
4	12	100	100	240	100 LCRS
8	24	100	100	360	50 LDERS
16	48	100	100	480	-

1. Law of Increasing return to scale:

It states that the value of outputs keeps on increasing with every increasing in the inputs where a given increase in the inputs leads to a more than proportional change in output.

2. Law of constant return to scale:

It states that the rate of increasing inputs is almost equal to the rate of proportional output of the organisation.

3. Law of decreasing return to scale:

It states that the proportional increasing in the inputs doesn't lead to equivalent increase in the output. The output increase at decreasing rate.

From the above table, it is clear that with 1 unit of capital and 3 units of labour, the firm produces 50 units of output. When the inputs are doubled two units of capital and six units of labour, the output has gone up to 120 units. (From 50 units to 120 units). Thus, when inputs are increased by 100 percent, the output has increased by 140 percent. That is, output has increased by more than double. This is governed by *Law of Increasing Returns to Scale*.

When the inputs are further doubled that is to 4 units of capital and 12 units of labour, the output has gone up to 240 units. (from 120 units to 240 units). Thus, when inputs are increased by 100 per cent, the output has increased by 100 per cent. That is, output also has doubled. This is governed by *Law of Constant Returns to Scale*.

When the inputs are further doubled, that is, to 8 units of capital and 24 units of labour, the output has gone up to 360 units. (from 240 units to 360 units). Thus, when input are increased by 100 per cent, the has increased only by 50 per cent. This is governed by *Law of Decreasing Returns to Scale*.

Economies of scale:

The Economies of scale result because of increase in the scale of production. Alfred Marshall, divides the EOS into 2 groups.

Internal Economics of the organisation effects on output of the organisation.

Acc to Alfred Marshall, economies of scale mainly divided into two types.

1. Internal Economies of scale
2. External Economies of scale

1. Internal Economies of scale?

Internal Economics denotes, the economics in the production cost and their effects which are occurred to the firms alone when it expands its output of the production.

MCF - MTR - RL

1) Managerial Economies:

Every firm must be need qualified managerial persons to handling & monitoring the all the activities of firm functions like finance, marketing, production, operation and R & D departments.

All the departments work together in order to increase the productivity of organisation. Specialisation in the departments will always emphasise on reduction of wastages.

2) Commercial Economies:

Commercial Economics means the transaction of buying and selling of raw materials. Such as ^{Spare} Square parts and soon. The procurement of raw materials cost will be directly effective on production cost and this will be leads to increase the profits of the organisation.

3) Financial Economics:

Financial Economics denotes there could be a cheaper credit facilities from the financial institution to meet the capital expenditure or working capital requirements. A large scale firms has larger asights to give security to the financial institutions (Banks). which can be consider increase the loan capacity and reduce the rate of intrest.

4) Technical Economics:

Increase the sales and production follows when there is sophisticated Technology available and the firm is in a position to hire qualified technical manpower (Employees) to make use of it.

5) Marketing Techno Economics:

As a firms grows larger and larger, it can be offered to maintain fullfledged marketing system or department. The marketing department handle issues related to design of the product, promotional related activities and gathering information from the customers by customer service

6) Risk bearing Economics:

As there is a growth in the size of the firm. There is increase in risk also. Most of the business organisations profits will be depends on how much risk they are ready to face and also depends on their risk oriented decision

1) Economics of R & D:

Large scale organisations are maintained Research & development departments in their organisations. It is requires high in disturbance for the purpose of to introduce new innovative & invention products. These products are (used for) help for sustain in the competitive environment.

2) Economics of Larger Dimension:

2. External Economics of scale:

1) Economics of concentration:

C.R.W.

Economics of concentration refers, ^{If} all firms are located in one place, it is likely that there is a better in first infrastructure in terms of road construction, Transportation, Electricity, Banking & communication facilities and so on.

These economics will helpful to the organisation (individually) reduction of infrastructure.

2) Economics of welfare:

Economics of welfare refers, there could be a common facilities such as canteen, Industrial housing, Hospitals, School & colleges and so on. which can be used in common by the employees in the industry.

3) Economics of R&D:

Most of the firms maintained R&D department to face the competitions, but ^{some} small scale & medium scale industries are unable to maintain R&D departments. So that there are depends on large scale R&D department.

Constant Elasticity of Substitution:

Constant elasticity of substitution implies that any change in input factor results constant change in outputs. If a constant elasticity of substitution is constant and may not necessary equal to one (or) unity.

The constant elasticity of substitution product function

$$Q = \frac{A [\alpha K - \phi + (1 - \alpha) L - \phi] - 1}{\phi}$$

where, α = constant elasticity of production function
 A = Efficiency parameter.
 α = Distribution parameter
 ϕ = substitution parameter, denotes elasticity of substitution.

NOTE: The homogeneity of production function can be determined by the values of substitution parameter ϕ . If it is equal to 1, there should be considered as a linear homogeneous. That means proportional change in input factor result in same proportions of output.

Unit - IV

Market Analysis

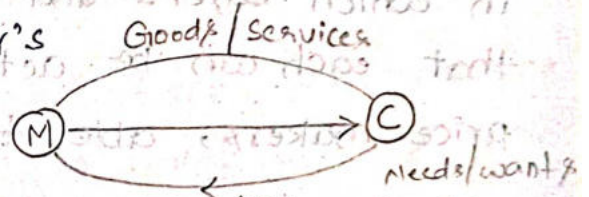
1. price output determination in (monopoly) perfect & imperfect competition
2. profit meaning and profit Theories
3. profit planning measurements

Market:

Market is a place where goods or services are exchange one to another. In market two types of people are involved. Those are: (1) Buyer's

(2) Seller's

Ex: vegetable market, Fish market



Marketing:

Marketing is a systematic process where goods & services are transferred from manufacture to customers with an ultimate aim of getting profits and satisfying the needs and wants of the customers.

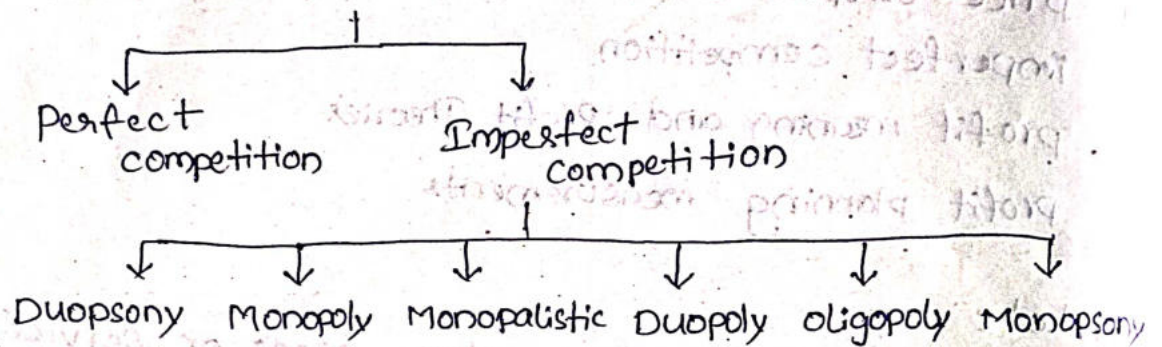
Size of the market:

Size of the market depends on characteristics of the market and their influences on performance of the firm.

1. The degree of buyer's concentration
2. The degree of seller's concentration
3. The degree of product differentiation
4. product offerability (quality & Availability)
5. The degree of entry and exist from the market

Market structure :

Market structure - competition



1. Perfect competition:

Perfect competition means an ideal market situation in which buyer's and seller's ^{are} ~~are~~ numerous and informed that each can be act as a price takers rather than price makers, ^{or} able to buy or sale any desire quantity affecting the market price. There is a freedom of entry and exit from the industry.

Features of perfect competition:

1. Large no. of buyer's and seller's.
2. Firms can easily enter and exist from the market. *Freedom to enter & exit the market*
3. NO government restrictions. *perfect mobility of factors of production*
4. Price takers. *each firm is price taker*
5. Product homogeneity (similar). *Homogeneous product or service*
6. Perfect information available to buyers and sellers.

In perfect competition, there are large no. of buyer's and seller's in the market.

The individual firm as a buyer and seller is simply price taker.

2. Firms can easily enter & exist from the market:

In perfect competition market, the firms are free to enter in the market. It ensures of normal profit in the perfect competition. When profits is more new firms enter the market and this leads to competition.

3. No government restrictions:

In perfect competition, there is no government intervention in the form of taxes, licensing policies, control over the supply of raw material.

4. Price takers:

A firm in perfect competition market cannot influence the market through its more individual actions. It has no alternative other than selling its products at, ^{spread} Prevails in the market. It cannot sell as much as it wants, at its own set price.

5. Total Revenue TR Product homogeneity:

In perfect competition, all firms produce similar products and all products are perfectly same in terms of price, shape, colour, ...

Total Revenue (TR), Average Revenue (AR), and Marginal Revenue (MR):

Total Revenue (TR):

Total Revenue = No. of quantities ^{product sold} x price of each quantity

$$TR = Q \times P$$

$$\boxed{TR = PQ}$$

Average Revenue (AR): ^{revenue earned per unit sold}

$$\text{Average Revenue} = \frac{\text{Total Revenue}}{\text{No. of Quantities}}$$

$$AR = \frac{TR}{Q}$$

$$AR = \frac{PQ}{Q}$$

$$\boxed{AR = P}$$

P = price of the product

Marginal Revenue (MR)

Marginal Revenue, refers to the change in revenue by producing and selling one more unit. It should be considered as marginal Revenue.

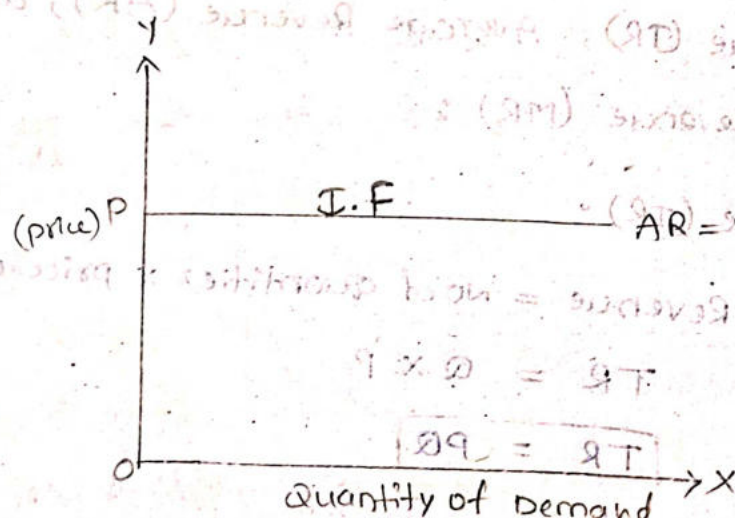
NOTE: Under perfect competition,

$$\text{Price} = \text{Average Revenue} = \text{Marginal Revenue}$$

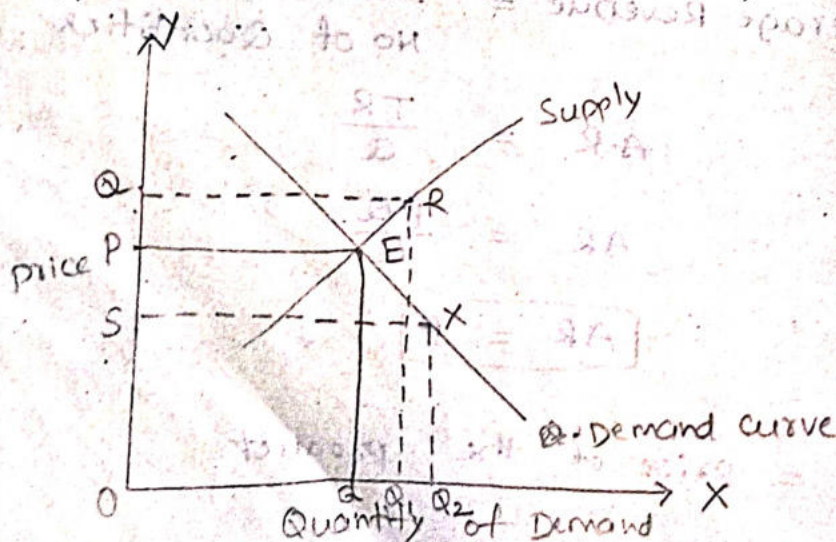
Perfect competition - Individual Firms:

Perfect competition in individual firms at certain level of price. The price value, average Revenue marginal revenue are having equal values.

In Individual firms, under perfect competition conditions, firms has no control over the price. It is always in a position of passive price takers.



Perfect competition - Firms and Industries:



1. The pricing strategy in perfect competition is charge the same price as other firm charge.
2. According to law of demand concept, when price of the goods & services increases, the demand of the goods & services decreases.
3. And the relationship b/n price & supply; when price of the goods & services increases, supply is also increases. when price is low, the competition b/n the consumers can raises and when prices increases the competition among the seller's reduces.

In above diagram, the demand & supply curves meet with each other. The point will be ensures as equilibrium point. It should be represented as 'E'.

It should be identified at 'OP' level of price and 'OQ' level of quantity.

NOTE:

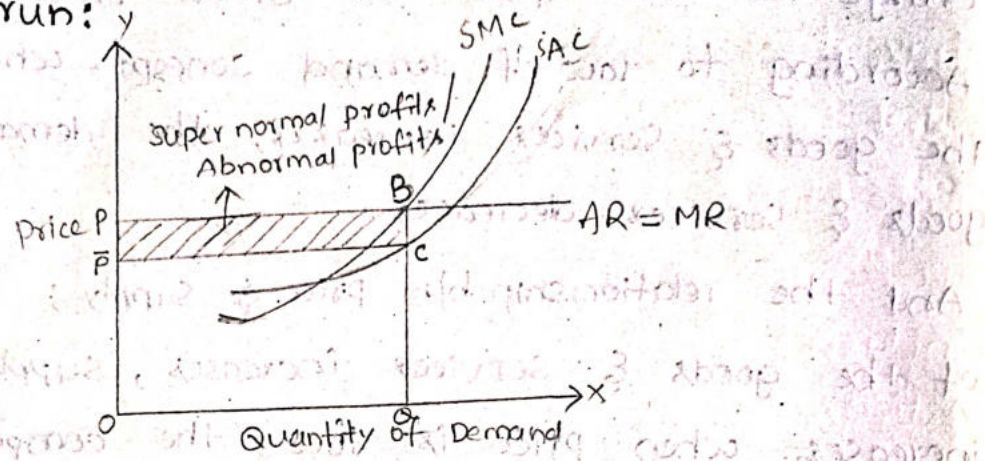
1. when price is increases from 'OP' to 'OQ₁' and quantity of demand increases from OQ to OQ₁ and equilibrium point measured as 'R'. But, it ensures that supply is higher than the demand of the product. (Supply > demand).

It may be leads additional expenditure to the organisation.

2. when price is decreases from 'OP' to 'OS' and the quantity of demand decreases from OQ to OQ₂ and equilibrium point is measured as 'X'.

Price output determination in perfect competition market

- short run:



1. In the above diagram, under price output determination

in perfect competition market (- short run) in horizontal axis, we are taken quantity of demand of firms and industries.

In vertical axis, we are taken prices of the produced products.

2. As per perfect competition, individual firms at certain level of output, price of the product is equal to AR and MR values.

When average revenue is constant, it will be coincide with marginal revenue. so that, the curve is considere as Average Revenue curve.

And also Marginal Revenue curves.

under price output determination in perfect competition market must be satisfy the two conditions

(a) $MR = MC$ (Marginal Revenue = Marginal cost)

(b) MC curve must be cut the MR curve from below that means 'MC' curve passes through minimum point of 'AC' curve.

conditions :

1. $OP = OB$ which is price.

$OP = OC$ which is Average cost

$OQ = PC$ which is Equilibrium output

Average profit = Price - Average cost.

In above diagram, BC is Average profit and area $(PB \text{ and } PC)$ $PBPC$ total profit. which is also consider

as Super normal (or) Abnormal normal profits.

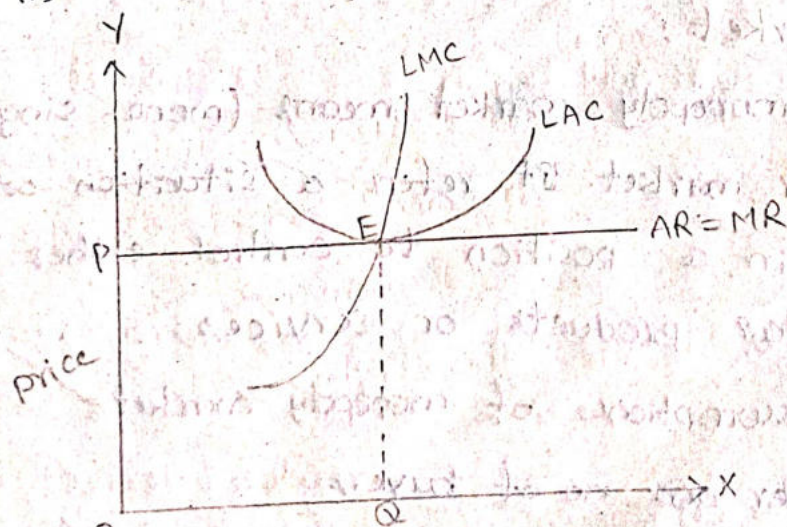
Price output determination in perfect competition market - long run :

1. In price output determination in long run under perfect competition market. The most of the firms are attracted by super normal profits of the firms in the short run.

2. The entry of the firms in the industry continuously increases up to super normal profits are completely consider

as a normal profit - losses to the organisation.

3. These normal profits are just sufficient for informs just stay in the competitions (or) competitive business.



In above fig. under price output determination in perfect competition market - long run.

- In horizontal axes we are taken quantity of demand, firms and Industries in vertical axes we are taken price of the produced products.
- As per perfect competition - individual firms at certain level of output price of the product is equal to AR & MR values.
- Conditions under perfect competition - longrun.
 - a) $MR = MC$
 - b) $AR = AC$ and AC must be passed through AR at minimum level of AC.
- Long run marginal cost (LMC) curve passes through minimum point of long run, Average cost curve at point 'E'. So that 'E' should be considered as Equilibrium point. At this point firm produce 'OQ' level of output.
- If the market price is below longrun, average cost of the firms will help quit the industry.

Since, in the long run, the firms have to recover the Average cost / Average Revenue.

Monopoly market :

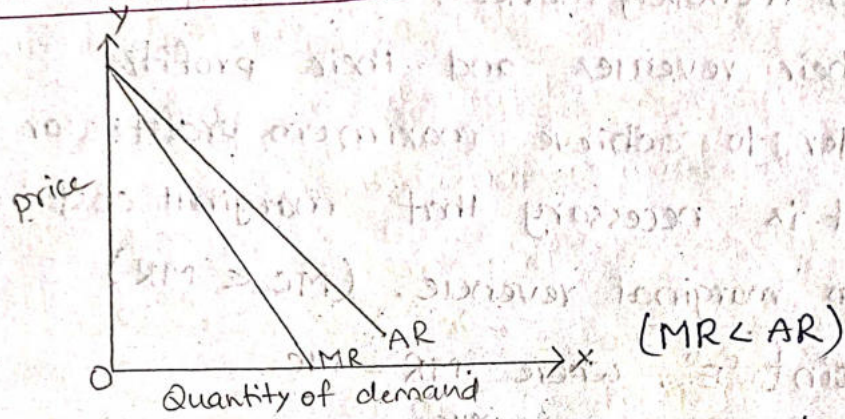
In monopoly market means (mono - single, poly - seller) single seller market. It refers a situation where single firms is in a position to control either supply or price of particular products or services.

Features - Assumptions of monopoly market:

1. Single seller and no. of buyers.
2. Firms is enable to enter and exist from the market.
3. Firms is always in a position, price makers (price deciders).
4. There is no close substitutes.

5. The monopolistic can be decide the price and quantity and both.

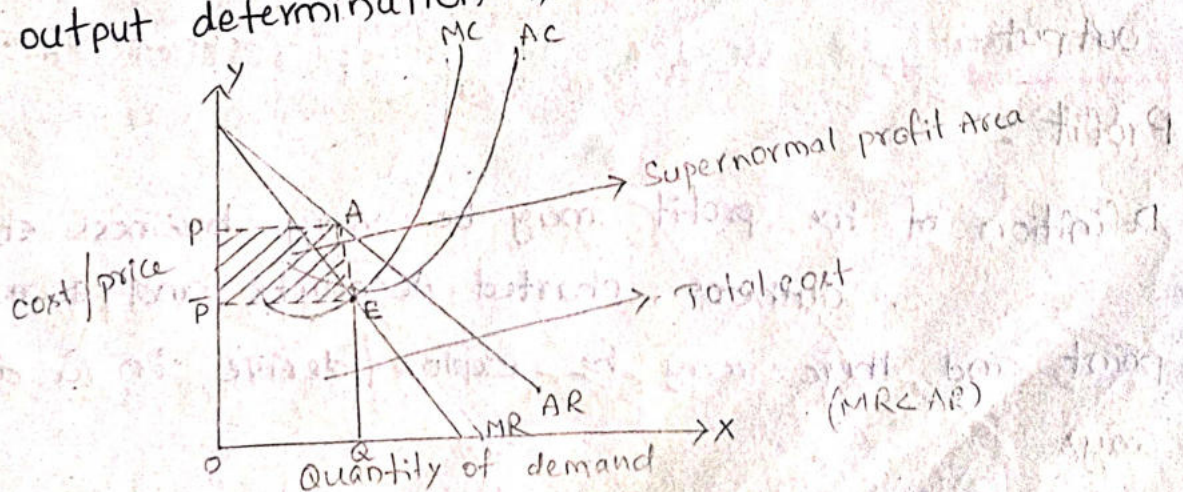
In monopoly market, marginal revenue is always less than the Average revenue.



Ex: 'X' person selling note books and each note book price value is 10/- with the main motive of individual if any sell 10 note books an then excuse 10% discount so the price of the 10 bookes is 90/-

The average revenue (selling price per each unit) is 10/- and the marginal revenue is 9/- so that, in case of monopoly market, the average revenue is always higher than marginal revenue. (Due to Discount or consaction)

Price output determination is monopoly market:



Under monopoly market, Average Revenue is always higher than compare to marginal Revenue Curve

Average Revenue curve of the firm is always downwards sloping. Due to the firm produced products price value is less (price discounts). Then, the demand for the goods & services increases.

In monopoly market, the monopolist always to increase their revenues and their profits.

In order to achieve maximum profits or super norm profits, it is necessary that marginal cost of the firm lesser than marginal revenue. ($MC < MR$)

At point 'E', where $MR = MC$

The Average ^{Revenue} curve is represented as 'AR' and marginal Revenue curve is represented as 'MR'.

The Average cost by 'AC' and marginal cost by 'MC'.

The 'OQ' should be consider as a equilibrium quantity of output. 'OP' is consider as equilibrium price,

OP 'OP' is Average cost and 'A' is Average profit.

upto OQ output MR is greater than MC ($MR > MC$) and behind OQ MR is less than MC ($MR < MC$) so that, the monopolist will be in equilibrium at 'OQ' level of output.

Profit :

Definition of the profit may be vary business enterprise, authors, chartered Accounts and economist point and there may be explore/derive in a different ways.

Profit simply means a positive gain that means earning from the business organisation or investment after deductive (or) subtract all expenses / cost

Functions of Profit:

1. measure the performance:

It measures the net effectiveness and soundness of the business effect. A higher profit is an indicator that the business is being run successfully and effectively.

It is a true that profit should be considered as a perfect measure of business, effectiveness and efficiency.

2. Premium to cover cost of staying in business:

Profit is a premium that covers cost, which are for production of products, expenditure and staying in business.

3. Accounting profit and Economic profit:

In the Accounting sense profit is regarded as the revenue realised during the period minus the cost and expenses incurred in a production (or) producing the revenue.

The economist, however, does not agree with the accounting approach profit because of accounting profit would only detect the explicit (or) actual cost from the earning value.

$$\text{Accounting profit} = \text{Earning value} - \text{Explicit cost}$$

(or)

$$\text{Accounting profit} = TR - (W + R + I + M) \rightarrow \text{Explicit cost}$$

where, TR = Total Revenue

W = wages

R = Rate of Interest (or) Rent

I = Interest

M = materials

Ex: $TR = 3,50,000$, wages = 80,000, Interest = 6000,
materials = 40,000, Rent = 10,000

Sol:

Accounting Profit = $TR - (W + R + I + M)$

$$= 3,50,000 - (80,000 + 10,000 + 6000 + 40,000)$$

$$= 3,50,000 - 1,24,000$$

$$= 2,26,000$$

→ In economist point out that, Accounting profit does not consider as a pure profit. In addition to, accounting profit, we must be detect the explicit value (or) explicit cost from the total revenue.

Explicit cost means, the cost would be incurred in options of the employment of self owned factors should be detected. like entrepreneurs wages, Interest on self own capital, building rents and so on, all are should be consider as Explicit cost of the organisation.

Economic Profit = Total Revenue - (Explicit cost + Implicit cost)

Ex: $TR = 3,50,000$, own building Rent = 10,000

Self employment salary = 40,000, wages = 80,000,

Interest = 6000

$$\text{Economic Profit} = \text{TR} - (\text{Explicit cost} + \text{Implicit cost})$$

$$= 3,50,000 - 1,24,000 - 40,000$$

$$= 1,86,000$$

Economic profit is consider as pure profit of the organisation.

Profiteering and profit sharing:

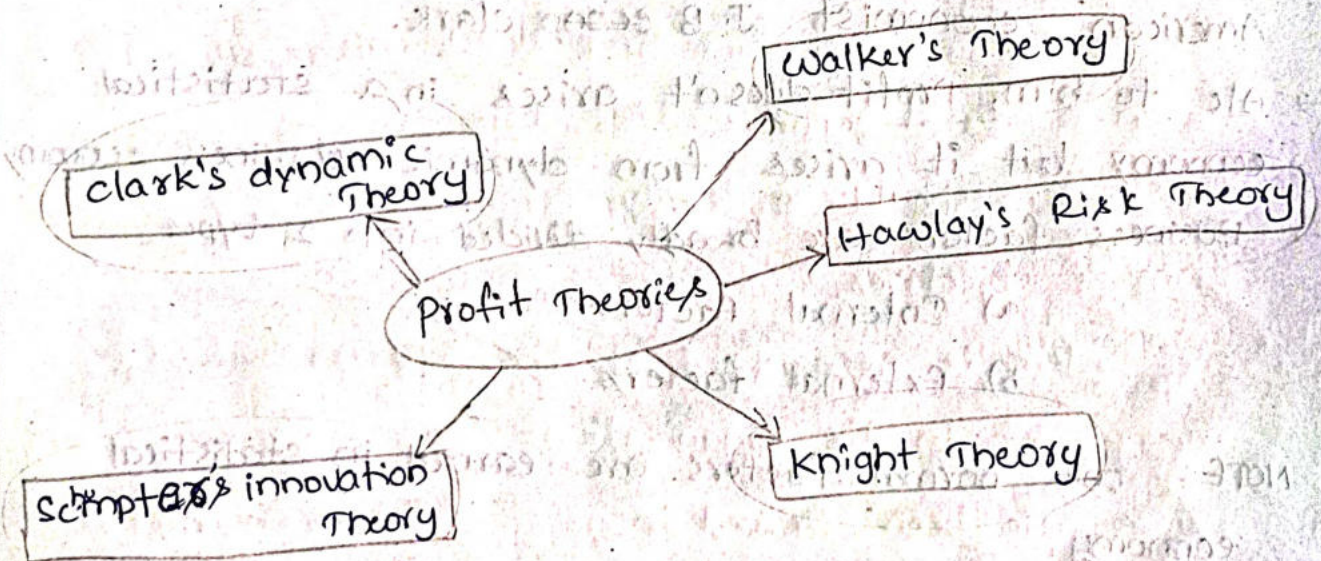
Profiteering has to be understood and

distant from profit earnings & profit sharing.

where the amount of profit is too exceeded, a socially acceptable limited by questionable method. That means

firms earning money doesn't acceptable by the society members.

Theories of profit:



1. walker's Theory:

An American economist professor F.A. walker propound, the theory of profit known as Rent theory. Rent is difference b/n least and most area covered land. Similarly, profit is difference b/n earnings of the least & most efficient entrepreneurs.

Least earnings - It covers cost of the goods

most earnings - Expanding the existing business

Drawbacks of Walker's Theory:

1. The theory provides only a measure of profit.
The theory doesn't focus on nature of profit.
2. Earning of the profits by the firms depends on ability of the entrepreneurs which doesn't always true. It may be depends on monopolistic provision of the firms.

2. Clark's Dynamic Theory:

Clark's dynamic theory is introduced by

American economist J. B. Clark.

→ A/c to him, profit doesn't arise in a statistical economy but it arises from dynamic business economy.

→ Business factors are broadly divided into 2 types

- a) Internal factors
- b) External factors

NOTE: only normal factors are earned in statistical economy.

Characteristics - statistical economy:

1. Size of the population.
2. Amount of the capital.
3. There is no risk & uncertainty.

Characteristics - dynamic economy:

- a) multiplication of consumer wants.
- b) Increase the population.
- c) Advantages

3. Hawday's Risk Theory:

According to Hawday's (F.B Hawday's) in the year of 1983. Profit is rewarded of risk taking in business during the conduct of any business activity, all other functions of production i.e., land, labour, capital have generated, incomes to the entrepreneurs (or) successful business people.

Critisizes / Drawbacks of Hawday's Risk Theory:

1. Successful entrepreneurs, they are not ready to take / face any risks but they want their increase the profits.

4. Schumpeter's Innovation Theory:

According to the Schumpeter's, Profits of the business is rewarded after innovation.

Innovation:

- a) New Technology adopted in the existing products.
- b) New methods of production.
- c) Adopt new ways to reduce the delivery time.
- d) New sources of raw material

Generally, Innovation takes place in two ways.

- 1) Reduction of cost of production by introducing the new materials.
- 2) Enhancing the business activities / Finding the new market.

5. Knight Theory :

Knight Theory is also known as Uncertainty - Bearing Theory.

→ As to knight, profit is rewarded for uncertainty - bearing not to be considered as Risk taking.

→ Knight Theory $\begin{cases} \rightarrow \text{certainty} & - \text{calculated risk} \\ \rightarrow \text{uncertainty} & - \text{non-calculated risk} \end{cases}$

Profit planning :

Essential elements of planning :

1. Objectives and Results are established.
2. CEO place a crucial ~~not~~ role in order to development of any business activities and he is also responsible person of profit getting.
3. The system should be totally persived especially in framing objectives.
4. The system is recognized as the key method of management in the organisation.
5. plans have been primed in by economist or associated by business persons.
6. Budgeting, cost of control, contribution analysis are the key elements of profit planning.

Steps in Profit planning :

Establishment of suitable objectives



Setting proper control system



Establishing the job responsibilities



Maintaining the audit



Gap Analysis



Maintaining the Base data



profit planning strategies

Profit measurements :

Profit place a very important role ~~there~~ in

any business activities.

→ The expansion & integration of business activities

will be depends on profits only.

→ Normally, measurement of the profit is a difficult task

But, it contains

(i) Inclusiveness costs
(wages + salaries + own charges)

(ii) Depreciation

1) It is a 'important bearing;

2) The cost of the capital consumption if replaced with equipment.

Causes of depreciation:

1. Physical Depreciation
2. Functional Depreciation
3. Accidental Depreciation

Methods:

EMI - Equated monthly

↓
Installment

1. Straight line method:

It is a simplest and most commonly used method of depreciation.

- It is also known as Equal Installment method.
- The value of depreciation declines at constant rate.
- The Annual depreciation is calculated by dividing the initial cost of an asset by estimated life in years assuming that there is no scrap value.
- If any scrap value, then the amount should be deducted from initial cost.

2. The unit of production method:

1. Estimated working hours.

2. A/c to this method, capital expenses of an equipment are recovered on the basis of the expected production.

3. The mileage method:

→ Under this method depreciation value is calculated on the basis of mileage.

Ex: Automobiles

4. Declining Balancing method:

1. constant percentage of depreciation in each year.
2. Under this method, Depreciation is high in early part of the asset's life time period at certain rate of values.

(3) Treatment of capital Gain & Losses:

1. Inflation (price value increases)
2. Deflation (price value decreases)
3. stragglation (In between)

UNIT – 5

NATIONAL INCOME & BUSINESS CYCLE

NATIONAL INCOME:

Crucial indicators of economic activity:

1. **Economic Performance:** National income provides a snapshot of the country's economic performance. A growing national income is generally associated with economic expansion and increased production of goods and services.
2. **Standard of Living:** National income per capita, obtained by dividing the total national income by the population, is often used as an indicator of the average standard of living in a country. Higher national income per capita is generally associated with a higher standard of living.
3. **Employment:** A growing national income is often correlated with increased employment opportunities. As economic activity expands, businesses may hire more workers to meet the rising demand for goods and services.
4. **Government Revenue:** National income is crucial for governments as it directly influences tax revenue. Taxation is often based on income, and a higher national income provides the government with more resources to fund public services and infrastructure.
5. **Investment Climate:** Investors and businesses often use national income data to assess the economic climate of a country. A growing national income can be an indication of a healthy and expanding economy, making it an attractive destination for investment.
6. **Policy Formulation:** Governments and policymakers rely on national income data to formulate economic policies. Understanding the trends in national income helps policymakers identify areas that need attention, such as addressing economic downturns or managing inflation.
7. **International Comparisons:** National income allows for comparisons between different countries. It provides insights into the relative economic strengths and weaknesses of nations, helping policymakers and analysts make informed decisions.
8. **Economic Growth:** National income growth is a key component of overall economic growth. Sustainable economic growth, reflected in increasing national income, is essential for long-term prosperity.

Parameters that play a significant role in influencing economic activity:

1. **Interest Rates:** Central banks use interest rates as a tool to control the money supply and influence economic activity. Lower interest rates generally encourage borrowing and spending, stimulating economic activity, while higher rates can have the opposite effect.
2. **Government Fiscal Policy:** Government fiscal policies, including taxation and government spending, can impact economic activity. Tax cuts and increased government spending can boost demand, while tax hikes and spending cuts can have a contractionary effect.
3. **Consumer Confidence:** The level of confidence consumers have in the economy affects their spending habits. High consumer confidence typically leads to increased spending, which contributes to economic growth.
4. **Business Confidence:** Similarly, the confidence of businesses in the economic environment influences their investment decisions. High business confidence can lead to increased capital investment, job creation, and expansion.

5. **Inflation Rate:** Moderate inflation is generally considered healthy for an economy, as it encourages spending and investment. However, high or unpredictable inflation can erode purchasing power, affecting consumer and business decisions.
6. **Unemployment Rate:** The level of unemployment is a crucial indicator of economic health. Low unemployment often correlates with higher economic activity, as more people are employed and have income to spend.
7. **Global Economic Conditions:** International factors, such as global economic trends, trade agreements, and geopolitical events, can influence a country's economic activity. Changes in global demand for goods and services can impact exports and imports.
8. **Technological Advances:** Technological innovations can significantly impact economic activity by improving productivity, creating new industries, and changing the way businesses operate.
9. **Exchange Rates:** Exchange rates influence international trade and competitiveness. A weaker currency can boost exports but may lead to higher import costs, while a stronger currency can have the opposite effect.
10. **Government Regulations:** The regulatory environment can either encourage or hinder economic activity. Business-friendly regulations that provide stability and clarity can promote investment and growth.
11. **Infrastructure Development:** Adequate infrastructure, including transportation, communication, and energy systems, is essential for economic activity. Well-developed infrastructure can enhance productivity and attract investment.
12. **Demographic Factors:** Population growth, age distribution, and workforce skills are demographic factors that can impact economic activity. A growing and skilled workforce can contribute to economic expansion.
13. **Financial Market Conditions:** The conditions in financial markets, including the availability of credit and the performance of stock markets, can influence spending and investment decisions.
14. **Natural Disasters and External Shocks:** Unexpected events such as natural disasters, pandemics, or geopolitical crises can have significant short-term and long-term impacts on economic activity.