STUDY MATERIAL FOR BUSINESS ADMINISTRATION

MANAGERIAL ECONOMICS

SEMESTER - I

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PREPARED BY

BUSINESS ADMINISTRATION DEPARTMENT

INDEX

UNIT - I

INTRODUCTION TO MANAGERIAL ECONOMICS

INTRODUCTION

Managerial Economics is subject gained popularity in USA after the publication of the book Managerial Economics" by Joel Dean in 1951.

Managerial Economics refers to the firm's decision making process. It could be also interpreted as "Economics of Management" or "Economics of Management". Managerial Economics is also called as "Industrial Economics" or "Business Economics".

As Joel Dean observes managerial economics show economic analysis can be used in formulating polices.

MEANING & DEFINITION:

In the words of E.F. Brigham and J.L. Pappas Managerial Economics is "the applications of economics theory and methodology to business administration practice".

M. H. Spencer and Louis Siegel man explain the "Managerial Economics is the integration of economic theory with business practice for the purpose of facilitating decision making and forward planning by management".

Managerial Economics, therefore, focuses on those tools and techniques, which are useful in decision-making.

NATURE OF MANAGERIAL ECONOMICS

Managerial economics is, perhaps, the youngest of all the social sciences. Since it originates from Economics, it has the basis features of economics, such as assuming that other things remaining the same.

THE OTHER FEATURES OF MANAGERIAL ECONOMICS ARE EXPLAINED AS BELOW:

CLOSE TO MICRO ECONOMICS:

Managerial economics is concerned with finding the solutions for different managerial problems of a particular firm. Thus, it is more close to micro economics.

OPERATES AGAINST THE BACK DROP OF MACROECONOMICS:

The macroeconomics conditions of the economy are also seen as limiting factors for the firm to operate. In other words, the managerial economist has to be aware of the limits set by the macroeconomics conditions such as government industrial policy, inflation and so on.

NORMATIVE STATEMENTS:

A normative statement usually includes or implies the words 'ought' or 'should'. They reflect people's moral attitudes and are expressions of what a team of people ought to do. For instance, it deals with statements such as 'Government of India should open up the economy. Such statement are based on value judgments and express views of what is 'good 'or 'bad', 'right' or 'wrong'. One problem with normative statements is that they cannot to verify by looking at the facts, because they mostly deal with the future. Disagreements about such statements are usually settled by voting on them.

PRESCRIPTIVE ACTIONS:

Prescriptive action is goal oriented. Given a problem and the objectives of the firm, it suggests the course of action from the available alternatives for optimal solution .If does not merely mention the concept, it also explains whether the concept can be applied in a given context For instance the fact that variable costs are marginal costs can be used to judge the feasibility of an export order.

APPLIED IN NATURE:

'Models' are built to reflect the real life complex business situations and these models are of immense help to managers for decision-making. The different areas where models are extensively used include inventory control, optimization, project management etc. In managerial economics, we also employ case study methods to conceptualize the problem, identify that alternative and determine the best course of action.

OFFERS

SCOPE TO EVALUATE EACH ALTERNATIVE:

Managerial economics provides an opportunity to evaluate each alternative in terms of its costs and revenue. The managerial economist can decide which is the better alternative to maximize the profits for the firm.

INTER DISCIPLINARY:

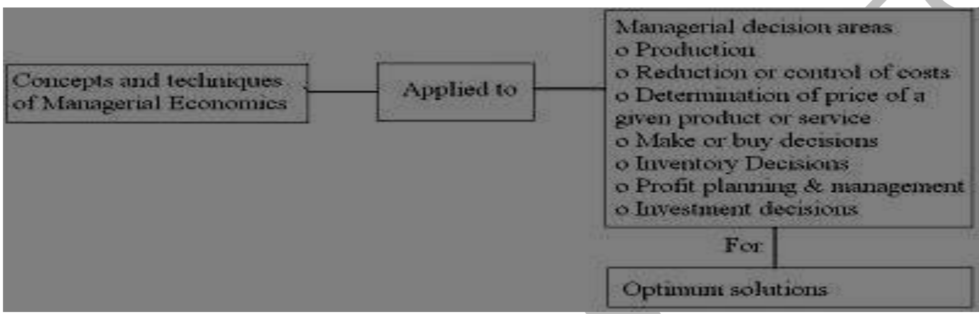
The contents, tools and techniques of managerial economics are drawn from different subjects such as economics, management, mathematics, statistics, accountancy, psychology, organizational behaviour, sociology and etc.

ASSUMPTIONS AND LIMITATIONS:

Every concept and theory of managerial economics is based on certain assumption and as such their validity is not universal. Where there is change in assumptions, the theory may not hold good at all.

SCOPE OF MANAGERIAL ECONOMICS:

The main focus in managerial economics is to find an optimal solution to a given managerial problems. The problem may relate to production, reduction or control of costs, determination of price of a given product or service, make or buy decisions, inventory decisions, capital management or profit planning and investment decisions or human resource management. While all these are the problems, the managerial economist make use of the concepts ,tools and techniques of economics and other related disciplines to find an optimal solution to a given managerial problem. This concept is explained in the below figure.



UNIT - II

DEMAND ANALYSIS:

A business firm is an economic organism which transforms productive resources into goods that are to be sold in a market. The analysis of a demand for a given product and service is the first task of managerial economist. Before production schedules can be prepared and resources employed, a forecast of future sales is essential. This forecast can also serve as a guide to management for maintaining or strengthening the market position and enlarging profits. Demand Analysis helps in identify the various factors influencing the demand fora firm's product and thus provides guidelines to manipulating demand. Demand analysis and forecasting, therefore, is essential for business planning and occupies a strategic place in Managerial Economics.

COST ANALYSIS:

A study of economic costs, combined with the data drawn from the firm's accounting records, can yield significant cost estimates that are useful for managerial decisions. The factors causing variations in costs must be recognized and allowed for if management is to arrive at cost estimates which are significant for planning purpose. The chief topics covered under cost analysis are cost concept and classifications, cost output relationship, economies and diseconomies of scale and cost control and cost reduction.

PRICING DECISIONS:

Pricing is very important area of managerial economics. In fact, price is the source of the revenue of a firm and as such the success of a business firm largely depends on the correctness of the price determination in various market forms, pricing, methods, differential pricing, product line pricing and price forecasting.

PRODUCTION AND SUPPLY ANALYSIS:

Production Analysis is narrower in scope that cost analysis production Analysis frequently proceed in physical term while cost analysis proceeds in monetary terms. Production analysis mainly deals with different production functions and their managerial use.

Supply analysis deals with various aspects of supply of a commodity. Certain important aspects of supply analysis are: supply schedule, curves and

Function Law of supply and its limitations. Elasticity of supply and factors influencing supply.

PROFIT ANALYSIS:

Profit making is the major goal of firms. There are several constraints here an account of competition from other products, changing input prices and changing business Environment hence in spite of careful planning, there is always certain risk involved. Managerial economics deals with techniques of averting of minimizing risks. Profit theory guides in the measurement and management of profit, in calculating the pure return on capital, besides future profit planning.

CAPITAL MANAGEMENT:

Among the various problems of a business, the most complex and difficult for the business manager are likely to be those relating to the Firms capital investments. Relatively large sums are involved and the problems are so complex that their disposal not only requires considerate time and labour but is a matter for top level decisions. Briefly capital management implies planning and control of capital expenditure. The main topics dealt with are cost of capital, rate of return and selection or projects.

STRATEGIC PLANNING:

Strategic planning provides management with a framework on which long- term decisions can be made which has an impact on the behaviour of the firm. The firm sets

Certain long-term goals

And objectives and selects the strategies to achieve the same.

Strategic planning is now a new addition to the scope of managerial economics with the emergence of multinational corporations.

The perspective of strategic planning is global. It is in contrast to project planning which focuses on a specific project or activity. In fact the integration of managerial economics and strategic planning has given rise to be aware of study called corporate economics.

CONCLUSION:

The various aspects outlined above represent the major uncertainties which a business firm has to reckon with, via, demand uncertainty, cost uncertainty, price uncertainty, profit uncertainty and capital uncertainty.

We can therefore, conclude that the subject matter or managerial economics consists of applying economic principles and concepts towards adjusting with various uncertainties faced by a business firm.

THEORY OF DEMAND

Demand analysis, law of demand, movement in demand curve, shift in the demand curve, Elasticity of demand, Types & Significance of Elasticity of demand, measurement techniques of Price Elasticity, demand forecasting and its techniques, consumers Equilibrium, cardinal utility approach, indifference curve approach, consumer surplus.

DEMAND ANALYSIS.

INTRODUCTION & MEANING:

Demand in common par lance means the desire for an object. But in economics demand is something more than this. According to Stonier and Hague, "Demand in economics means demand backed up by enough money to pay for the goods demanded". This means that the demand becomes effective only it if is backed by the purchasing power in addition to this there must be willingness to buy a commodity.

Thus demand in economics means the desire backed by the willingness to buy a commodity and the purchasing power to pay. In the words of "Bentham" "The demand for anything at a given price is the amount of it which will be bought per unit of time at that Price". (Thus demand is always at a price for a definite quantity at a specified time.) Thus demand has three essentials – price, quantity, demanded and time. Without these, demand has to significance in economics.

IT DEALS WITH FOUR ASPECTS:

- Consumption
- Production
- Exchange
- Distribution

DEFINITION OF DEMAND

According to Bentham

"The demand for anything, at a given price, is the amount of it, which will be bought per unit of time, at that price."

According to Bobber, "By demand we mean the various quantities of a given commodity or service which consumers would buy in one market in a given period of time at various prices." Demand = Desire +Ability to Pay + Willingness to Pay Above conditions must be there to create demand.

DETERMINANTS OF MARKET DEMAND

DEFINITION:

The Market Demand is defined as the sum of individual demands for a product per unit of time, at a given price. Simply, the total quantity of a commodity demanded by all the buyers/individual given price, other things remaining same is called the market demand.

PRICE OF A PRODUCT

The price of a product is one of the most important determinants of its demand in the long run and the only determinant in the short run. The quantity of the product demanded by the consumer inversely depends upon the price of the product. If the price rise demand falls and vice versa. The relation between price and demand is called Law of demand. It is not only the existing price but also the expected changes in price which affect demand.

PRICE OF RELATED GOODS

The demand for accommodate is also affected by the changes in the price of its related goods. Related goods may be substitutes or complementary goods.

SUBSTITUTES

Two commodities are substitutes for one another if change in the price of one affects the demand for the other in the same direction. For example X and Y are substitutes for one another. If price for X increases, demand for Y increases and vice versa. Tea and coffee, hamburgers and hot dogs, Coke and Pepsi are some examples of substitutes in the case of consumer goods.

COMPLEMENTS

Complementary Goods are those goods which complete the demand for each other, such as car and petrol or pen and ink. There is an inverse or negative relationship between the demand for first good and price of the second which happens to be complementary to the first. For example an increase in the price of petrol causes a decrease in the demand of car and other petrol run vehicles, other things remaining same

INCOME OF THE CONSUMER:

Income is the basic determinant of quantity of product demanded since it determines the purchasing power of the consumer .Income as determinant of demand is equally important in both short run and long run. The relationship between the demands for a commodity say, X

And the household income Y, assuming all other factors to remain constant, is expressed by a demand function such as:

$$D_x = f(Y), \Delta D_x / \Delta Y > 0$$

Experience shows that numerically there is a positive relationship between income of the consumer and his demand for a good. In other words, an increase in income would cause an increase in demand and economists therefore call such goods as normal goods. Normal goods are goods for which an increase in consumer's income results in an increase in demand .There are some goods; however which are called inferior goods. Inferior good is a good for which an increase in consumer's income results in a decrease in its demand.

Consumer taste and preference the demand for any goods and service depends on individual's taste and preferences. They include fashion, habit, custom etc. Tastes and preferences of the consumers are influenced by advertisement, changes in fashion, climate, and new invention. Other things being equal demand for those goods increases for which consumers develop taste and preferences. Contrary to it, an unfavourable change in consumer preferences and tastes for a product will cause demand to decrease.

ADVERTISEMENT EFFECT

Advertisement costs are incurred with the objective of promoting sale of the product. Advertisements help in increasing the demand in the following ways:

By informing potential consumers about the product and its availability By showing its superiority over rival product

By influencing consumer's choice against the rival products By setting new fashions and changing tastes.

There are instances when advertisements have changed lifestyle of people. Cadbury India has revolutionized the market for its leading product Dairy Milk through high profile advertising featuring Amitabh Bacchant with a slogan

CONSUMER'S EXPECTATIONS OF FUTURE INCOME AND PRICE:

Consumers do not make purchases only on the basis of current price structure. Especially in case of durables, when demand can be postponed, consumers decide their purchase on the basis of future price and income. If they expect their income to increase or price to fall in future, they will postpone their demand on the other hand if they expect price to increase in future they will hasten the purchase. For example, purchase of cars and other durables increases before budget is announced if consumers fear that prices may rise after budget. Or, when people expect pay revisions, they wait for major purchases till pay is revised.

SIZE OF POPULATION

Size of population, age distribution, rural urban distribution and gender distribution affect aggregate demand. If population of a country is constantly increasing, more food items and other goods and services will be needed to satisfy the needs of the people. Age distribution of the population determines what kind of Commodities will be demanded. If population mostly consists of aged people, there will be demand of more medicines and health care services. On the other hand if major section of population is youth, there will be more demand for education, employment opportunities and designer apparels.

OTHER FACTORS:

Distribution of national income, demonstration effect, credit facility, technical policy, climatic conditions all these are the factors which affect to the demand of the product.

LAW OF DEMNAND

Law of demand shows the relation between price and quantity demanded of a commodity in the market. In the words of Marshall, "the amount demand increases with a fall in price and diminishes with a rise in price".

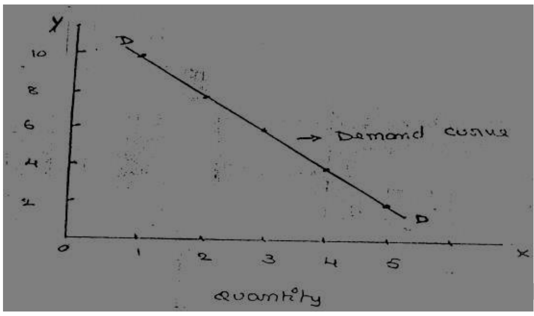
A rise in the price of a commodity is followed by a reduction in demand and a falling price is followed by an increase in demand, if a condition of demand remains constant.

The law of demand may be explained with the help of the following demand schedule. Demand Schedule

Price of Apple (In. Rs)	**Quantity Demanded**
10	1
8	2
6	3
4	4
2	5

When the price falls from Rs.10 to 8 quantity demand increases from1 to 2. In the same way as price falls, quantity demand increases on the basis of the demand schedule we can draw the demand curve.

Price



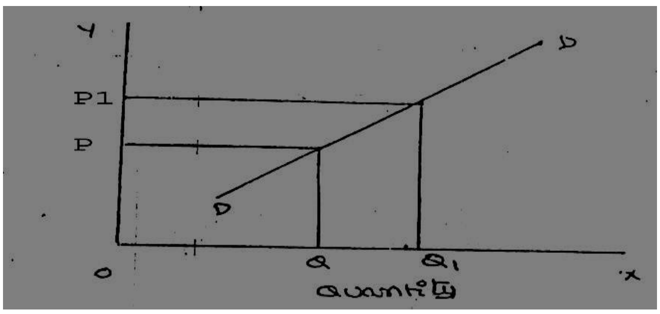
The demand curve DD shows the inverse relation between price and quantity demand of apple. It Is downward sloping.

ASSUMPTIONS:

- Law is demand is based on certain assumptions:
- This is no change in consumers taste and preferences.
- Income should remain constant.
- Prices of other goods should not change.
- There should be no substitute for the commodity
- The commodity should not confer at any distinction
- The demand for the commodity should be continuous
- People should not expect any change in the price of the commodity

EXCEPTIONAL DEMAND CURVE:

Sometimes the demand curve slopes upwards from left to right. In this case the demand curve has a positive slope.



PRICE

When price increases from OP to Op1 quantity demanded also increases from to OQ1 and vice versa .There as on for exceptional demand curve are as follows.

GIFFINS PARADOX:

The Griffins good or inferior good is an exception to the law of demand. When the price of an inferior good falls, the poor will buy less and vice versa. For example, when the price of maize falls, the poor are willing to spend more on superior goods than on maize if the price of maize increases, he has to increase the quantity of money spent on it. Otherwise he will have to face starvation. Thus a fall in price is followed by reduction in quantity demanded and vice versa. “Geffen” first explained this and therefore it is called as Geffen’s paradox.

VEBLEN OR DEMONSTRATION EFFECT:

‘Veblen’ has explained the exceptional demand curve through his doctrine of conspicuous consumption. Rich people buy certain good because it gives social distinction or prestige for example diamonds are bought by the richer class for the prestige it possess. It the price of diamonds falls poor also will buy is hence they will not give prestige. Therefore, rich people may stop buying this commodity.

IGNORANCE:

Sometimes, the quality of the commodity is Judge by its price. Consumers think that the product is superior if the price is high. As such they buy more at a higher price.

SPECULATIVE EFFECT:

If the price of the commodity is increasing the consumers will buy more of it because of the fear that it increases till further, thus, an increase in price may not be accomplished by a decrease in demand.

FEAR OF SHORTAGE:

During the times of emergency of war People may expect shortage of a commodity. At that time, they may buy more at a higher price to keep stocks for the future.

NECESSARIES:

In the case of necessaries like rice, vegetables etc. people buy more even at a higher price.

CHANGE IN DEMAND:

The increase or decrease in demand due to change in the factors other than price is called change in demand. Change in demand leads to a shift in the demand curve to the right or to the left.

INCREASE AND DECREASE IN DEMAND:

Increase and decrease in demand are referred to change in demand due to changes in various other factors such as change in income, distribution of income, change in consumer's tastes and preferences, change in the price of related goods, while Price factor is kept constant Increase in demand refers to the rise in demand of a product at a given price.

On the other hand, decrease in demand refers to the fall in demand of a product at a given price. For example, essential goods, such as salt would be consumed in equal quantity, irrespective of increase or decrease in its price. Therefore, increase in demand implies that there is an increase in demand for a product at any price. Similarly, decrease in demand can also be referred as same quantity demanded at lower price, as the quantity demanded at higher price.

Increase and decrease in demand is represented as the shift in demand curve. In the graphical representation of demand curve, the shifting of demand is demonstrated as the movement from one demand curve to another demand curve. In case of increase in demand, the demand curve shifts to right, while in case of decrease in demand, it shifts to left of the original demand curve.

FOLLOWING FIGURES HOW'S THE INCREASE IN DEMAND:

The above figure shows that, the movement from DD to D1D1 shows the increase in demand with price at constant (OP). However, the quantity has also increased from OQ to OQ1.

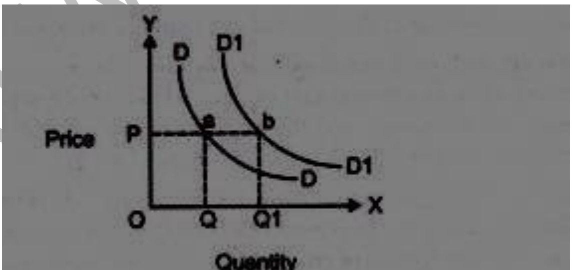


Figure-12: Increase in Demand

FOLLOWING FIGURES HOW'S THE DECREASE IN DEMAND:

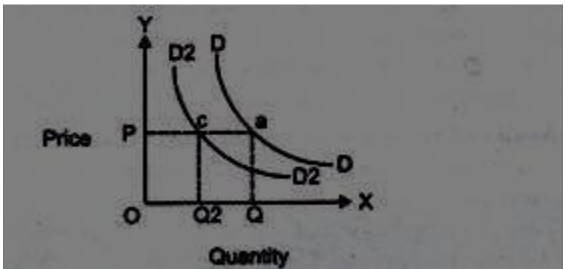


Figure-13: Decrease in Demand

The above figure shows that, the movement from DD to D2D2 shows the decrease in demand with price at constant (OP). However, the quantity has also decreased from OQ to OQ2.

EXPANSION AND CONTRACTION OF DEMAND:

The variations in the quantities demanded of a product with change in its price, while other factors are at constant, are termed as expansion or contraction of demand. Expansion of demand refers to the period when quantity demanded is more because of the fall in prices of a product. However, contraction of demand takes place when the quantity demanded is less due to rise in the price o a product.

For example, consumers would reduce the consumption of milk in case the prices of milk increases and vice versa. Expansion and contraction are represented by the movement along the same demand curve. Movement from one point to another in a downward direction shows the expansion of demand, while an upward movement demonstrates the contraction of demand.

FIGURE-11 DEMONSTRATES THE EXPANSION AND CONTRACTION OF DEMAND:

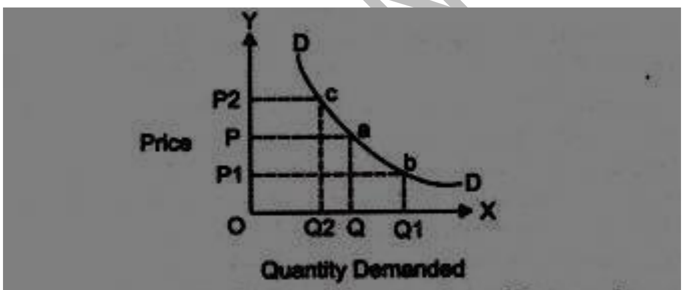


Figure-11: Expansion and Contraction of Demand

When the price changes from OPtoOP1 and demand moves from OQtoOQ1, it shows the expansion of demand. However, the movement of price from OPtoOP2 and movement of demand from OQ to OQ2 show the contraction of demand.

ELASTICITY OF DEMAND

Elasticity of demand explains the relationship between a change in price and consequent change in amount demanded. "Marshall" introduced the concept of elasticity of demand. Elasticity of demand shows the extent of change in quantity demanded to a change in price. In the words of "Marshall", "The elasticity of demand in a market is great or small according as the amount demanded increases much or little for a given fall in the price and diminishes much or little for a given rise in Price"

ELASTIC DEMAND:

A small change in price may lead to a great change in quantity demanded. In this case, demand is elastic.

IN-ELASTIC DEMAND:

If a big change in price is followed by a small change in demanded then the demand in "inelastic.

TYPES AND MEASUREMENTS OF ELASTICITY OF DEMAND:

There are three types of elasticity of demand:

- Price elasticity of demand
- Income elasticity of demand
- Cross elasticity of demand
- Advertising elasticity of demand

PRICE ELASTICITY OF DEMAND:

Marshall was the first economist to define price elasticity of demand. Price elasticity of demand measures changes in quantity demand to a change in Price. It is the ratio of percentage change in quantity demanded to a percentage change in price.

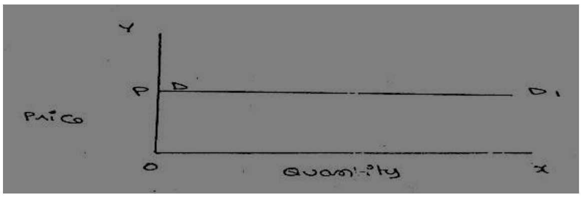
Proportionate change in the quantity demand of commodity

PRICE ELASTICITY

Proportionate change in the price of commodity there are five cases of price elasticity of demand

PERFECTLY ELASTIC DEMAND:

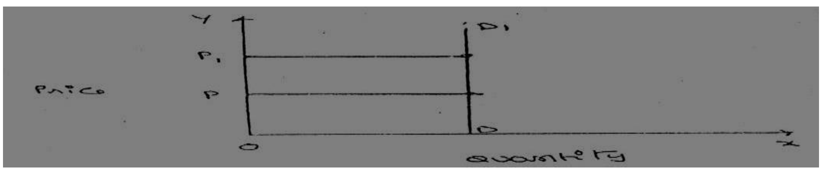
When small change in price leads to an infinitely large change is quantity demand, it is called perfectly or infinitely elastic demand. In this case E=∞



The demand curve DD1 is horizontal straight line. It shows the at "OP" price any amount is demand and if price increases, the consumer will not purchase the commodity.

PERFECTLY INELASTIC DEMAND

In this case, even a large change in price fails to bring about a change in quantity demanded.

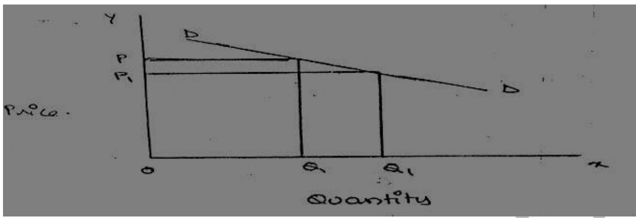


When price increases from 'OP' to 'OP', the quantity demanded remains the same. In other words the response of demand to a change in Price is nil. In this case 'E'=0.

RELATIVELY ELASTIC DEMAND:

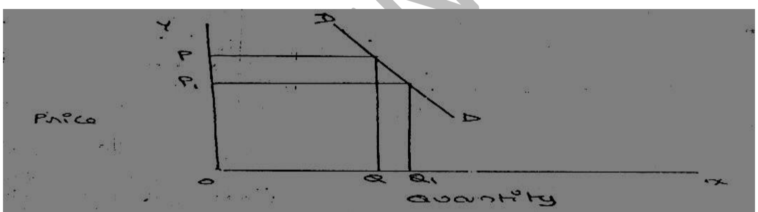
Demand changes more than proportionately to a change in price. I.e. a small change in price loads to a very big change in the quantity demanded. In this case

E>1.Thisdemand curve will be flatter.



When price falls from 'OP 'to 'OP', amount demanded increasefrom"OQ'to"OQ1' which is larger than the change in price.

RELATIVELY IN-ELASTIC DEMAND.

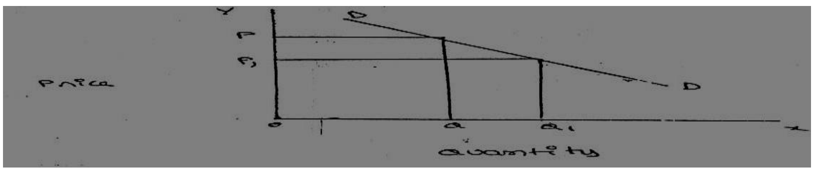


Quantity demanded changes less than proportional to a change in price. A large change in price leads to small change in amount demanded. Here E < 1. Demanded carve will be steeper.

Whenpricefallsfrom"OP'to'OP1amount demanded increases from OQ to OQ1, which is smaller than the change in price.

UNIT ELASTICITY OF DEMAND:

The change in demand is exactly equal to the change in price. When both are equal E=1 and elasticity if said to be unitary.



When price falls from 'OP 'to 'OP1'quantity demanded increases from 'OP' to'OP1',quantity demanded increases from'OQ'to'OQ1'.Thus a

Change in price has resulted in an equal change in quantity demanded so price elasticity of demand is equal to unity.

INCOME ELASTICITY OF DEMAND:

Income elasticity of demand shows the change in quantity demanded as a result of a change in income. Income elasticity of demand may best in the form of a formula.

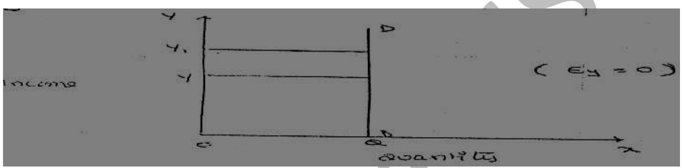
Proportion at change in the quantity demand of commodity

INCOME ELASTICITY

Proportion At change in the income Of the people Income elasticity of demand can Be classified into five types.

ZERO INCOME ELASTICITY:

Quantity demanded remains the same, even though money income increases. Symbolically, it can be expressed as Ey =0. It can be depicted in the following way:

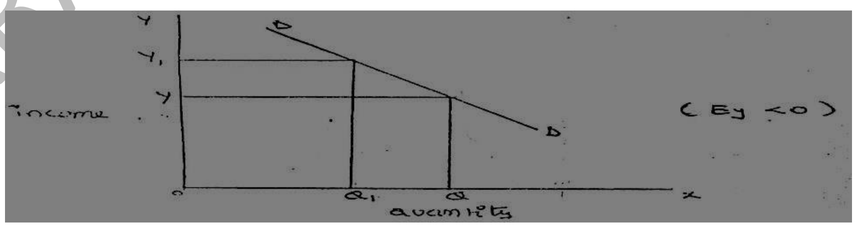


As income increases from OYtoOY1, quantity demanded never changes.

NEGATIVE INCOME ELASTICITY:

When income increases, quantity

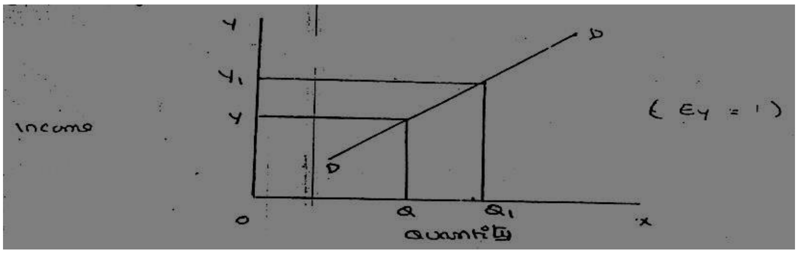
Demanded falls. In this case, income elasticity of demand is negative. i.e., Ey < 0.



When income increases from OY to OY1, demand falls from OQ to OQ1.

UNIT INCOME ELASTICITY:

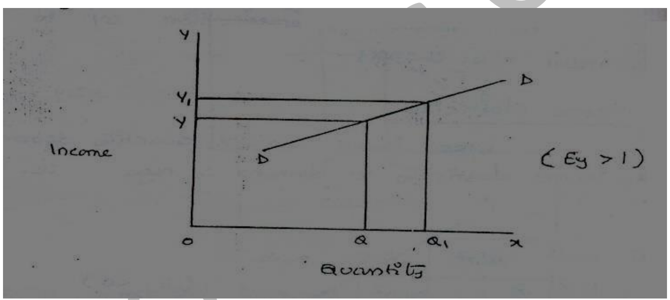
When an increase in income brings about proportionate increase in quantity demanded, and then income elasticity of demand is equal to one. Ey = 1



When income increases from OY to OY1, Quantity demanded also increases from OQ to OQ1.

INCOME ELASTICITY GREATER THAN UNITY:

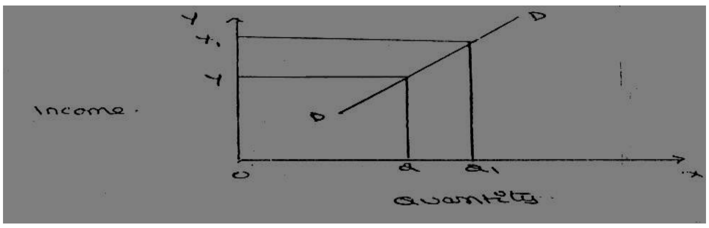
In this case, an increase income brings about a more than proportionate increase in quantity demanded. Symbolically it can be written as Ey> 1.



It's how high income elasticity of demand. When income increases from OY to OY1, Quantity demanded increases from OQ to OQ1.

INCOME ELASTICITY LEAST THAN UNITY:

When income increases quantity demanded also increases but less than proportionately. In this case E <1.



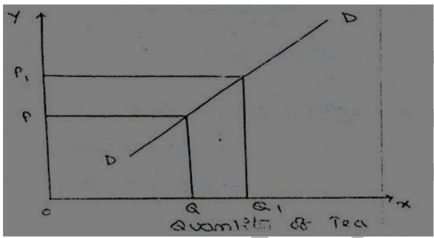
An increase in income from OY to OY, brings what an increase in quantity demanded from OQ to OQ1, But the increase in quantity demanded is smaller than the increase in income. Hence, income elasticity of demand is less than one.

CROSS ELASTICITY OF DEMAND:

A change in the price of one commodity leads to a change in the quantity demanded of another commodity. This is called a cross elasticity of demand. The formula for cross elasticity of demand is:

Proportionate change in the quantity demand of commodity “X” Cross elasticity = Proportionate change in the price of commodity “Y”

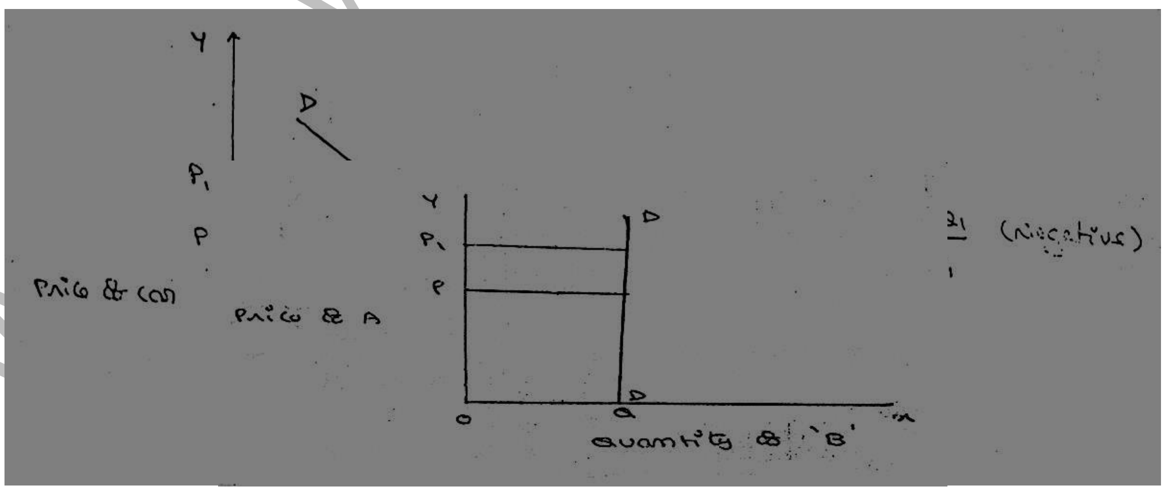
In case of substitutes, cross elasticity of demand is positive. E.g.: Coffee and Tea When the price of coffee increases, Quantity demanded of tea increases. Both are substitutes.



PRICE OF COFFEE

In case of compliments, cross elasticity is negative. If increase in the price of one commodity leads to a decrease in the quantity demanded of another and vice versa.

When price of car goes up from OP to OP, the quantity demanded of petrol decreases from OQ to OQ!. The cross-demanded curve has negative slope.



In case of unrelated commodities, cross elasticity of demanded is zero. A change in the price of one commodity will not affect the quantity demanded of another.

Quantity demanded of commodity "b" remains unchanged due to a change in the price of 'A', as both are unrelated goods.

ADVERTISING ELASTICITY OF DEMAND:

Advertising elasticity of demand shows the change in quantity demanded as a result of a change in cost of Advertisement.

Advertising elasticity of demand may be slated in the form of a formula. Proportionate change in the quantity demand of commodity Advertising

NATURE OF COMMODITY

Elasticity of demand of a commodity is influenced by it nature. A commodity for a person may be a necessity, a comfort or a luxury.

When a commodity is a necessity like food grains, vegetables, medicines, etc., its demand is generally inelastic as it is required for human survival and its demand does not fluctuate much with change in price.

When a commodity is a comfort like fan, refrigerator, etc., its demand is generally elastic as consumer can postpone its consumption.

When a commodity is a luxury like AC, DVD player, etc., its demand is generally more elastic as compared to demand for comforts .The term 'luxury' is a relative term as any item (like AC) ,may be a luxury for a poor person but a necessity for a rich person.

AVAILABILITY OF SUBSTITUTES

Demand for a commodity with large number of substitutes will be more elastic. The reason is that even a small rise in its prices will induce the buyers to go for its substitutes .For example, arise in the price of Pepsi encourages buyers to buy Coke and vice-versa.

Thus, availability of close substitutes makes the demand sensitive to change in the prices. On the other hand, commodities with fewer no substitutes like wheat and salt have less price elasticity of demand

INCOME LEVEL:

Elasticity of demand for any commodity is generally less for higher income level groups in comparison to people with low incomes. It happens because rich people are not influenced much by changes in the price of goods .But, poor people are highly affected by increase or decrease in the price of goods. As a result, demand for lower income group is highly elastic.

LEVEL OF PRICE:

Level of price also affects the price elasticity of demand. Costly goods like laptop, Plasma TV, etc. .have highly elastic demand as their demand is very sensitive to changes in their prices.

However, demand for inexpensive goods like needle, match box, etc. is inelastic as change in prices of such goods do not change their demand by a considerable amount.

POSTPONEMENT OF CONSUMPTION:

Commodities like biscuits, soft drinks, etc. whose demand is not urgent, have highly elastic demand as their consumption can be postponed in case of an increase in their prices. However, commodities with urgent demand like lifesaving drugs, have inelastic demand because of their immediate requirement.

NUMBER OF USES:

If the commodity under consideration has several uses, then its demand will be elastic .When price of such a commodity increases, then it is generally put to only more urgent uses and, as a result, its demand falls. When the prices fall, then it is used for satisfying even less urgent needs and demand rises.

For example, electricity is a multiple-use commodity. Fall in its price will result in substantial increase in its demand, particularly in those uses (like AC, Heat convector, etc.), where it was not employed formerly due to its high price. On the other hand, a commodity with no or few alternative uses has less elastic demand.

SHARE IN TOTAL EXPENDITURE:

Proportion of consumer's income that is spent on a particular commodity also influences the elasticity of demand for it. Greater the proportion of income spent on the commodity, more is the elasticity of demand for it and vice-versa.

Demand for goods like salt, needle, soap, matchbox, etc. tends to be inelastic as consumers spend a small proportion of their income on such goods. When prices of such goods change, consumers continue to purchase almost the same quantity of these goods. However, if the proportion of income spent on a commodity is large, then demand for such a commodity will be elastic.

TIME PERIOD:

Price elasticity of demand is always related to a period of time. It can be a day, a week, a month, a year or a period of several years. Elasticity of demand varies directly with the time period. Demand is generally inelastic in the short period. It happens because consumers find it difficult to change their habits, in the short period, in order to respond to a change in the price of the given commodity. However, demand is more elastic in long rim as it is comparatively easier to shift to other substitutes, if the price of the given commodity rises.

HABITS:

Commodities which have become habitual necessities for the consumers have less elastic demand. It happens because such a commodity becomes a necessity for the consumer and he continues to purchase it even if its price rises. Alcohol, tobacco, cigarettes, etc. are some examples of habit forming commodities

Finally it can be concluded that elasticity of demand for a commodity is affected by number of factors. However, it is difficult to say, which particular factor or combination of factors determines the elasticity. It all depends upon circumstances of each case.

IMPORTANCE OF ELASTICITY OF DEMAND:

The concept of elasticity of demand is of much practical importance.

PRICE FIXATION

The elasticity of demand for a product is the basis of its price determination. The ratio in which the demand for a product will fall with the rise in its price and vice versa can be known with the knowledge of elasticity of demand

If the demand for a product is in elastic, the producer can charge high price for it, whereas for an elastic demand product he will charge low price. Thus, the knowledge of elasticity of demand is essential for management in order to earn maximum profit.

DETERMINATION OF FACTORS OF PRODUCTION

The concept of elasticity for demand is of great importance for determining prices of various factors of production. Factors of production are paid according to their elasticity of demand. In other words, if the demand of a factor is inelastic, its price will be high and if it is elastic, its price will be low.

IN DEMAND FORECASTING:

The elasticity of demand is the basis of demand forecasting. The knowledge of income elasticity is essential for demand forecasting of producible goods in future. Long- term production planning and management depend more on the income elasticity because management can know the effect of changing income levels on the demand for his product.

IN THE DETERMINATION OF GOVERNMENT POLICIES:

The knowledge of elasticity of demand is also helpful for the government in determining its policies. Before imposing statutory price control on a product, the government must consider the elasticity of demand for that product .The government decision to declare public utilities those industries whose products have inelastic demand and are in danger of being controlled by monopolist interests depends upon the elasticity of demand for their products.

IN THE DETERMINATION OF OUTPUT LEVEL:

For making production profitable, it is essential that the quantity of goods and services should be produced corresponding to the demand for that product .Since the changes in demand is due to the change in price, the knowledge of elasticity of demand is necessary for determining the output level.

HELPFUL IN ADOPTING THE POLICY OF PROTECTION:

The government considers the elasticity of demand of the products of those industries which apply for the grant of a subsidy or protection .Subsidy or protection is given to only those industries whose products have an elastic demand. As a consequence, they are unable to face foreign competition unless their prices are lowered through subsidy or by raising the prices of imported goods by imposing heavy duties on them.

IN THE DETERMINATION OF GAINS FROM INTERNATIONAL TRADE:

The gains from international trade depend, among others, on the elasticity of demand. A country will gain from international trade if it exports goods with less elasticity of demand and import those goods for which its demand is elastic.

In the first case, it will be in a position to charge a high price for its products and in the latter case it will be paying less for the goods obtained from the other country. Thus, it gains both ways and shall be able to increase the volume of its exports and imports.

THE LAW OF SUPPLY AND DETERMINANTS OF SUPPLY

In the previous unit, we discussed the law of demand. In this section, we turn to the other side of the market and to discuss the law of supply, specifically the law of Market supply. Market supply means the quantity of a commodity which all its producers or sellers offer to sell at a given price, per unit of time .Market supply, like market demand, is the sum of supplies of a commodity made by all individual firms.

The law of supply can be stated as the supply of a product increases with the increase in its price and decreases with decrease in its price, other things remaining constant. It implies that the supply of a commodity and its price are positively related. This relationship holds under the assumption that “other things remaining the same” .Other things include cost of production, change in technology, price of related goods (substitutes and complements), and weather and climate in case of agricultural products.

THE SUPPLY FACTORS

In reality, the supply of a commodity depends on its price, cost of production and production technology .In other words, supply of a product X is the function of its price), cost of production and technology of its production in its functional form

In simple theory of supply, however, the law of supply is expressed generally in terms of price-quantity relationship supply function is expressed as
$Qx=f(Px)$ ...(5.1)

THE SUPPLY SCHEDULE

The supply schedule is a tabular presentation of the supply function. In fact, a supply schedule is a table showing alternative prices of a commodity and the corresponding quantity that suppliers are willing to offer for sale.

Table5.1 presents a hypothetical supply schedule of shirts per month.

TABLE5.1SUPPLY SCHEDULE FOR SHIRTS

Price (in`)	100	200	300	400	600	800
Supply (Shirts in '000)	10	40	55	70	75	80

It can be seen fromTable5.1 that at price`100 per shirt, only 10 Thousand shirts would be supplied per month. When price increases to 200, suppliers offer 40 thousand shirts for sale. And, when pricerisesto`400, supply rises to 70 thousands Shirts, and so on.

THE SUPPLY CURVE

A supply curve is a graphical depiction the supply schedule. The supply curve given in P, Q, R, T and S. The price-quantity combinations on the supply curve supply curve depict the law of supply. The upward slope of the supply curve indicates the rise in the supply of shirts with the rise .In its price and falling the supply with fall in its price.

SUPPLY CURVE OF SHIFT IN THE SUPPLY CURVE

We have shown above that a change in the price of a commodity causes a change in quantity supplied along a given supply curve .Although price of a commodity is the most important determinant of its supply, it is not the only determinant .Many other factors influence the supply of a commodity. Given a supply curve, when there is change in other determinants, the supply curve shifts right war do leftward depending on the effect of such changes. Let us now explain how other determinants of supply cause shift in the supply curve.

CHANGE IN INPUT PRICES When input prices go down, the use of inputs increases or more inputs can be used data given total cost .As result, products Increase sand the supply curve shifts to the right

TECHNOLOGICAL PROGRESS Technological changes that reduce cost of production or increase factor efficiency increase the product supply. For instance, introduction of high yielding varieties of paddy and new techniques of cultivation increased price in India in the 1970s.Such changes make the supply curve shift to the right.

PRICE OF PRODUCT SUBSTITUTES In many kinds of production activities; it is possible to produce a substitute product. For example, a refrigerator company can also produce ACs; Tata's famous for the production of trucks produce

Also cars Marti a produce trucks, and soon. Fall in the price of one of the product substitutes may lead to the rise in the supply of other due to capacity utilization for profit maximization.

LEVEL OF COMPETITION AND SIZE OF THE INDUSTRY The supply of a commodity depends al soon whether an industry is monopolized or competitive. If a monopolized industry is made competitive, the total supply increases. Besides, if size of an industry increases because new firms join the industry, the total supply will increase and supply curve will shift rightward.

GOVERNMENT POLICY When government imposes restrictions on production, e.g. Import quota on inputs, exercise taxation etc. production tends to fall. Such restrictions make supply curve to shift leftward.

NON- ECONOMIC FACTORS The factors like war, drought, flood, communal riots, epidemics, etc. Also affect adversely the supply of commodities.

THE SUPPLY FUNCTION

The law of supply states only the nature of relationship between the price and the quantity supplied. A supply function quantifies this relationship. The supply function is ,in fact, a statement which states the relationship between the quantity supplied of a

Commodity (as a dependent variable) and its determinants (as independent variables).

ELASTICITY OF SUPPLY: MEASURES AND SIGNIFICANCE

Like the law of demand, the law of supply states only the nature of relationship between the change in the price of a commodity and the quantity supplied thereof .The law does not quantity the relationship .The quantitative relationship is measured by the price elasticity of supply.

The price elasticity of supply is the measure of responsiveness of the quantity supplied of a good to the changes in its market price. The coefficient to price elasticity of supply (ep) is the measure of percentage change in the quantity supplied of a product due to a given percentage change in its price. The formula of supply elasticity is given as

%Change in quantity supplied (Q) p

% change in price (P)

DETERMINANTS OF THE PRICE ELASTICITY OF SUPPLY

DERIVATIONS OF MARKET DEMAND

Market demand can be defined as the sum of individual demands for a product at a price per unit of time .We may recall that the quantity demanded of a commodity by an individual per unit of time, at a given price ,is known as 'individual demand' for that commodity. The aggregate of individual demands for a product is called market demand for the product. In other words, the sum of quantity demand by all the consumers/users of a commodity per unit of time at a given price, all other things remaining the same ,i s called' market demand' for that product.

For example, suppose there are only three consumers—A, B and C—of a commodity X which has a fixed price. Consumers A, B and C consume 100units, 200 unit and 300 units respectively, of commodity X monthly. Therefore, the monthly market demand for commodity X equals 100+200+300=600units.

DERIVATION OF MARKET DEMAND CURVE

If individual demand schedules or individual demand functions are known, the market demand schedule and market demand curve can easily be derived. The market demand curve can be derived by adding up

(i) The individual demand schedules, and

(ii) The individual demand functions. In this section, we illustrate the derivation of market

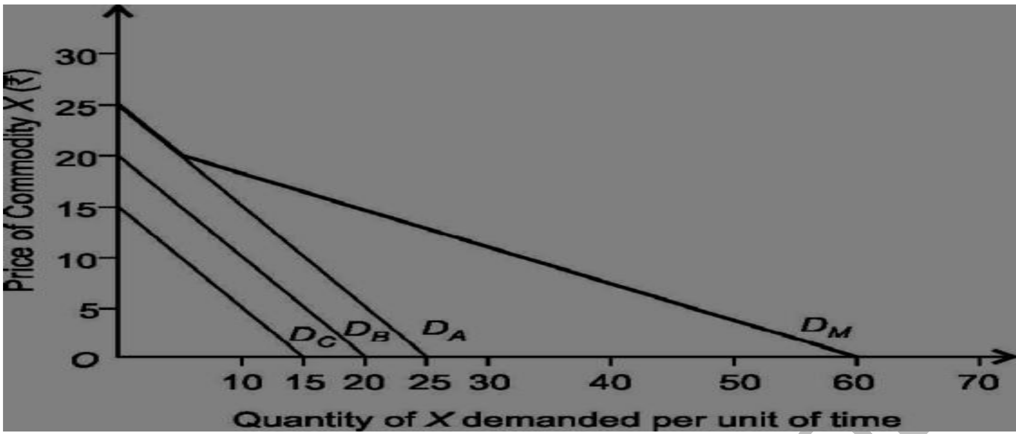
Demand curve by using these two methods.

DERIVATION OF MARKET DEMAND CURVE FROM INDIVIDUAL DEMAND SCHEDULES

Suppose again that there are three consumers (A, B and C) of a commodity X and their monthly demand schedules for the commodity are given in Table5.2. The table shows the quantity demanded of commodity X individually by the three consumers at different prices of commodity X. The last column shows the market demand, i.e., the sum of individual demands for commodity X. The market demands how the total quantity of commodity X demanded per month by the three consumers at different prices.

Given the individual and market demand schedules, the market demand curve can be obtain ed by plotting the market demand against the respective prices.\

This is illustrated in Fig.5.3 by the curve DM.



MARKET DEMAND FUNCTION:

DM=(100–10Px)+(75–7.5Px)+(50–5Px)

DM=225–22.5Px

This market demand function can be converted into a market demand schedule by assigning numerical values to P x. The market demand curve can then by plotting the demand schedule.

DEMAND FORECASTING

The information about the future is essential for both new firms and those planning to expand the scale of their production. Demand forecasting refers to an estimate of future demand for the product.

It is an 'objective assessment of the future course of demand". In recent times, forecasting plays an important role in business decision-making. Demand forecasting has an important influence on production planning. It is essential for a firm to produce the required quantities at the right time.

It is essential to distinguish between forecasts of demand and forecast so sales .Sales forecast is important for estimating revenue cash requirements and expenses. Demand forecasts relate to production, inventory control, timing, reliability of forecast etc. However, there is not much difference between these two terms.

Demand forecasting essentially involves ascertaining the expected level of demand during the period under consideration.

Sales is a function of demand. Likewise, even cost of production depends upon demand.

Production of any commodity requires time and resources.

In order to plan the level of production and make arrangements for the resources to be consumed, it is important to estimate future demand.

STAGES IN FORECASTING DEMAND

- Specification of objective(s)
- Selection of appropriate technique
- Collection of appropriate data
- Estimation and interpretation of results
- Evaluation of the forecasts

TYPES OF FORECASTS

- Forecasting level
- Degree of orientation
- Established or new products
- Nature of goods
- Degree of competition

Other factors: change in technology, change in political conditions, changes in customer preference and fashions etc.

TYPES OF DEMAND FORECASTING:

Based on the time span and planning requirements of business firms, demand forecasting can be classified in to

- **SHORT-TERM DEMAND FORECASTING AND**
- **LONG– TERM DEMAND FORECASTING**.

SHORT-TERM DEMAND FORECASTING:

Short-term demand forecasting is limited to short periods, usually for one year. It relates to policies regarding sales, purchase, price and finances. It refers to existing production capacity of the firm. Short-term forecasting is essential for formulating is essential for formulating a suitable price policy. If the business people expect of rise in the prices of raw materials of shortages, they may buy early. This price forecasting helps in sale policy formulation. Production may be undertaken based on expected sales and no actual sales. Further, demand forecasting assists in financial forecasting also. Prior information about production and sales is essential to provide additional funds on reasonable terms.

LONG–TERM FORECASTING:

In long-term forecasting, the businessmen should now about the long-term demand for the product. Planning of a new plant or expansion of an existing unit depend so long-term demand for different items. When forecast are mode covering long periods,

The probability of error is high. It is very difficult to forecast the production, the trend of prices and the nature of competition. Hence quality and competent forecasts are essential.

Prof. C.I .Savage and T.R. Small classify demand forecasting into 3 types. They are:

- **ECONOMIC FORECASTING,**
- **INDUSTRY FORECASTING,**
- **FIRM LEVEL FORECASTING**.

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

DEMAND FORECASTING TECHNIQUES

SURVEY METHOD

- Survey of buyers intention
- Census method
- Sample method
- Sales force opinion

STATISTICAL METHODS

- Trend projection methods
- Barometric techniques
- Trend line by observation
- Least squares method
- Time series analysis
- Moving averages method

EXPONENTIAL SMOOTHING

Simultaneous equation method (d) correlation and regression method

OTHER METHODS

- Expert opinion method
- Test marketing
- Controlled experiments
- Judgmental approach

SURVEY METHOD

CONSUMER'S SURVEY METHOD OR SURVEY OF BUYER'S INTENTIONS:

In this method, the consumers are directly approached is close their future purchase plans. I his is done by interviewing all consumers or a selected group of consumers out of the relevant population. This is the direct method of estimating demand in the short run. Here the burden of forecasting is shifted to the buyer. The firm may go in for complete enumeration or for sample surveys.

SALES FORCE OPINION METHOD:

This is also known as collective opinion method. In this method, instead of consumers, the opinion of the salesmen is sought. It is sometimes referred as the "grass roots approach " as it is a bottom-up method that requires each sales person in the company to make an individual forecast for his or her particular sales territory.

These individual forecasts are discussed and agreed with the sales manager. The composite of all forecasts then constitutes the sales forecast for the organisation. The advantages of this method are that it is easy and cheap. It does not involve any elaborate statistical treatment. The main merit of this method lies in the collective wisdom of salesmen. This method is more useful in forecasting sales of new products.

STATISTICAL METHOD:

Statistical methods have proved to be immensely useful in demand forecasting. In order to maintain objectivity, that is, by consideration of all implications and view in problem from an external point of view, the statistical methods are used.

THE IMPORTANT STATISTICAL METHODS ARE:

TREND PROJECTION METHOD

A firm existing for a long time will have its own data regarding sales for past years. Such data when arranged chronologically yield what is referred to as 'time series'. Time series shows the past sales with effective demand for a particular product under normal conditions .Such data can be given in a tabular or graphic form for further analysis. This is the most popular method among business firms , partly because it is simple and inexpensive and partly because time series data often exhibit a persistent growth trend.

TREND LINE BY OBSERVATION METHOD

This is the simplest technique to determine the trend. All values of output or sale for different years are plotted on a graph and a smooth free hand curve is drawn passing through as many points as possible .The direction of this free hand curve—upward or downward— shows the trend.

LEAST SQUARE METHOD:

Under the least square method, a trend line can be fitted to the time series data with the help of statistical techniques such as least square regression. When the trend in sales over time is given by straight line, the equation of this line is of the form: y

= a + bx. Where 'a' is the intercept and 'b' shows the impact of the independent variable. We have two variables—the independent variable x and the dependent variable y. The line of best fit establishes a kind of mathematical relationship between the two variables .v and y.

ΣS= Nx + yΣT

ΣST=xΣT+YΣT2

Whereas S=sales, T=year number, N= number of years

TIME SERIES ANALYSIS

Time series has got four types of components namely, Secular Trend (T), Secular Variation (S), Cyclical Element (C), and an Irregular or Random Variation(I).

These elements are expressed by the equation O= TSCI. Secular trend refers to the long run changes that occur as a result of general tendency.

Seasonal variations refer to changes in the short run weather or social habit. Cyclical variations refer to the changes that occur in industry during depression and boom. Random variation refers to the factors which are generally able such as wars, strikes, flood, and famine and so on.

When a forecast is made the seasonal, cyclical and random variations are removed from the observed data. Thus only the secular trend is left. This trend is then projected. Trend projection fits a trend line to a mathematical equation.

BAROMETRIC TECHNIQUE:

A barometer is an instrument of measuring change. This method is based on the notion that "the future can be predicted from certain happenings in the present." In other words, barometric techniques are based on the idea that certain events of the present can be used to predict the directions of change in the future. This is accomplished by the use of economic and statistical indicators which serve as barometers of economic change.

REGRESSION AND CORRELATION METHOD:

Regression and correlation are used for forecasting demand. Based on post data the future data trend is forecasted.

If the functional relationship is analysed with the independent variable it is simple correction. When there are several independent variables it is multiple correlation. In correlation we analyse the nature of relation between the variables while in regression; the extent of relation between the variables is analysed. The results are expressed in mathematical form. Therefore, it is called as econometric model building .The main advantage of this method is that it provides the values of the independent variables from within the model itself.

SIMULTANEOUS EQUATIONS MODEL:

Under simultaneous equation model, demand forecasting involves the estimation of several simultaneous equations. These equations are often the behavioural equations, market-clearing equations, and mathematical identities.

The regression technique is based on the assumption of one-way causation, which means independent variables cause variations in the dependent variables, and not vice-versa. In simple terms, the independent variable is in no way affected by the dependent variable. For example, D = a – bop, which shows that price affects demand, but demand does not affect the price, which is an unrealistic assumption.

On the contrary, the simultaneous equations model enables a forecaster to study the simultaneous interaction between the dependent and independent variables. Thus, simultaneous equation model is a systematic and complete approach to forecasting. This method employs several mathematical and statistical tools of estimation.

OTHER METHODS

EXPERT OPINION METHOD

In this method of demand forecasting, the firm makes an effort to obtain the opinion of experts who have long standing experience in the field of enquiry related to the product under consideration. If the forecast is based on the opinion of several experts then the approach is called forecasting through the use of panel consensus.

Although the panel consensus method usually results in forecasts that embody the collective wisdom of consulted experts, it may be at times unfavourably affected by the force of personality of one or few key individuals.

To counter this disadvantage of panel consensus, another approach is developed called the Delphi method. In this method a panel of experts is individually presented a series of questions pertaining to the forecasting problem. Responses acquired from the experts are analysed by an independent party that will provide the feedback to the panel members. Based on the responses of other individuals, each expert is then asked to make a revised forecast. This process continues till a consensus is reached or until further iterations generate no change in estimates.

The advantage of Delphi technique is that it helps individual panel members in assessing their forecasts. However Delphi method is quite expensive. Often, the most knowledgeable experts in the industry will command more fees .Besides, those who consider themselves as experts may be reluctant to be influenced by the opinions of others on the panel.

The main advantage of the Experts Opinion Survey Method is its simplicity. It does not require extensive statistical or mathematical calculations However this method has its own limitations. It is purely subjective. It substitutes opinion in place of analysis of the situation. Experts may have different forecasts or anyone among them may influence others. Who knows experts may be biased or have their own intentions behind providing their opinions. If the consulted experts are genuinely reliable then panel consensus could be perhaps the best method of forecasting.

TEST MARKETING:

The Test Marketing is one of the methods used under the Market Test. What The Test Marketing is yet another method of sales forecasting ,where in the new product is launched in the selected geographical areas ,the representative of the final market, to check the viability of the product and its demand among the selected group of people.

The test marketing is the most reliable method of sales forecasting wherein the product is launched in a few selected cities/town to check the response of customers towards the product. On the basis of such response, the firm decides whether to commercialize the product on a large scale .The test marketing must be performed without most care; the marketers must select those areas for testing that depicts the true image of the overall market.

CONTROLLED EXPERIMENTS:

Under this method, an effort is made to ascertain separately certain determinants of demand which can be maintained, e.g., price, advertising etc. and conducting the experiment, assuming etc. and conducting the experiment, assuming that the other factors remain constant.

Thus, the effect of demand determinants like price, advertisement packing etc., on sales can be assessed by either varying them over different markets or by varying them over different time periods in the same market.

JUDGMENTAL METHODS

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 judgment. Judgmental forecasting methods in corporate intuitive judgment, opinions and subjective probability estimates.

Judgmental forecasting is used in cases where there is lack of historical data or during completely new and unique market condition.

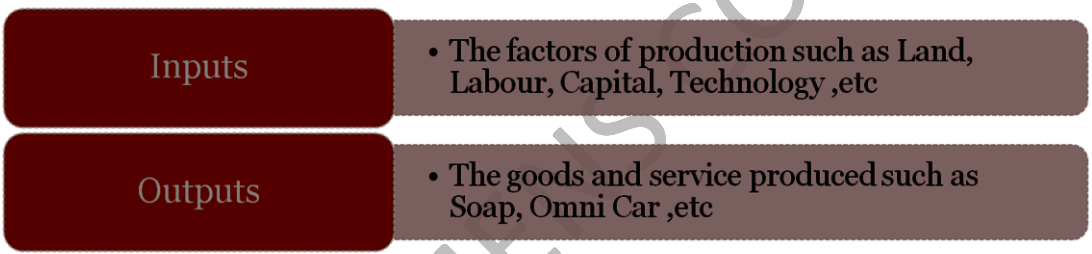
UNIT - III

PRODUCTION ANALYSIS

Production function, Production functions with one/two variables, Cobb- Douglas Production Function Marginal Rate of Technical Substitution ,Isoquants and Is costs, Returns to Scale and Returns to Factors ,Economies of scale. Cost concepts, determinant so cost, cost-output relationship in the short run and long run, short run vs. long run costs, average cost curves, Overall Cost leadership.

Introduction: Production Function Production

Production is processes that create /adds value or utility. It is the process in which the inputs are converted in to outputs.



INPUTS: FIXED INPUTS AND VARIABLE INPUTS

The factors of production that is carry out the production is called inputs.

FIXED INPUTS	VARIABLE INPUTS
Remain the same in the short period. At any level of output, the amount is remain the same. The cost of these inputs are called Fixed Cost	In the long run all factors of production are varies according to the volume of outputs. The cost of variable inputs is called Variable Cost
Examples:-Building, Land etc. (In the long run fixed inputs are become varies)	Example:- Raw materials, labour, etc

WHAT IS PRODUCTION FUNCTION?

The basic relationship between the factors of production and the output is referred to as a Production Function.

The firm's production function for a particular good (q) shows the maximum amount of the good that can be produced using alternative combinations of capital (K) and labour (L)

The production function expresses a functional relationship between physical inputs and physical outputs of a firm at any particular time period. The output is thus a function of inputs. Mathematically production function can be written as

Q= f (L1, L2, C,O,T) Where "Q" stands for the quantity of output and L1, L2, C,O,T are various input factors such as land, labour, capital and organization and technology. Here output is the function of inputs. Hence output becomes the dependent variable and inputs are the independent variables.

It is a technical relation which connects factors inputs used in the production function and the level of outputs

Q=f(L and, Labour, Capital, Organization ,Technology ,etc.)

The above function does not state by how much the output of "Q" changes as a consequence of change of variable inputs. In order to express the quantitative relationship between inputs and output, Production function has been expressed in a precise mathematical equation i.e.

Y= a + b (x)

Which shows that there is a constant relationship between applications of input (the only factor input 'X' in this case) and the amount of output (y) produced.

IMPORTANCE:

When inputs are specified in physical units, production function helps to estimate the level of production.

It becomes is equates when different combinations of inputs yield the same level of output.

It indicates the manner in which the firm can substitute on input for another without altering the total output.

When price is taken into consideration, the production function helps to select the least combination of inputs for the desired output.

It considers two types' input-output relationships namely 'law of variable proportions' and 'law of returns to scale'. Law of variable propositions explains the pattern of output in the short-run as the units of variable inputs are increased to increase the output. On the other hand law of returns to scale explains the pattern of output in the long run as all the units of inputs are increased.

The production function explains the maximum quantity of output, which can be produced, from any chosen quantities of various inputs or the minimum quantities of various inputs that are required to produce a given quantity of output.

Production function can be fitted the particular firm or industry or for the economy as whole. Production function will change with an improvement in technology.

Assumptions:

Production function has the following assumptions.

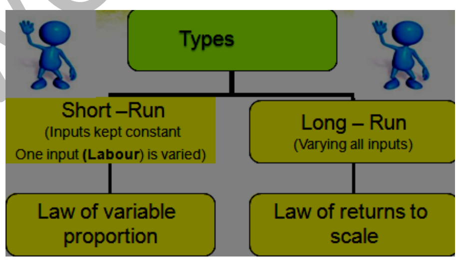
- The production function is related to a particular period of time.
- There is no change in technology.
- The producer is using the best techniques available.
- The factors of production are divisible.
- Production function can be fitted to a short run or to long run.

TYPES OF PRODUCTION FUNCTION:-

The two types

Law of variable proportions (short run production function)

Law of returns to scale (long run production function)



LAW OF VARIABLE PROPORTIONS:

The law of variable proportions which is a new name given to old classical concept of "Law of diminishing returns has played a vital role in the modern economics theory. Assume that a firms production function consists of fixed quantities of all inputs (land, equipment ,etc.)except labour which is a variable input when the firm expands output by employing more and more labour it alters the proportion between fixed and the variable inputs .The law can be stated as follows:

"When total output or production of a commodity is increased by adding units of a variable input while the quantities of other inputs are held constant, the increase in total production becomes after some point, smaller and smaller"

"If equal increments of one input are added, the inputs of other production services being held constant, beyond a certain point the resulting increments of product will decrease i.e. The marginal product will diminish".

"As the proportion of one factor in a combination of factors is increased, after a point, first the marginal and then the average product of that factor will diminish
The law of variable proportions refers to the behaviour of output as the quantity of one Factor is increased Keeping the quantity of other factors fixed and further its states that the marginal product and average product will eventually do cline.

ASSUMPTIONS OF THE LAW: The law is based upon the following assumptions:

The state of technology remains constant. If there is any improvement in technology, the average and marginal output will not decrease but increase.

Only one factor of input is made variable and other factors are kept constant. This law does not apply to those cases where the factors must be used in rigidly fixed proportions.

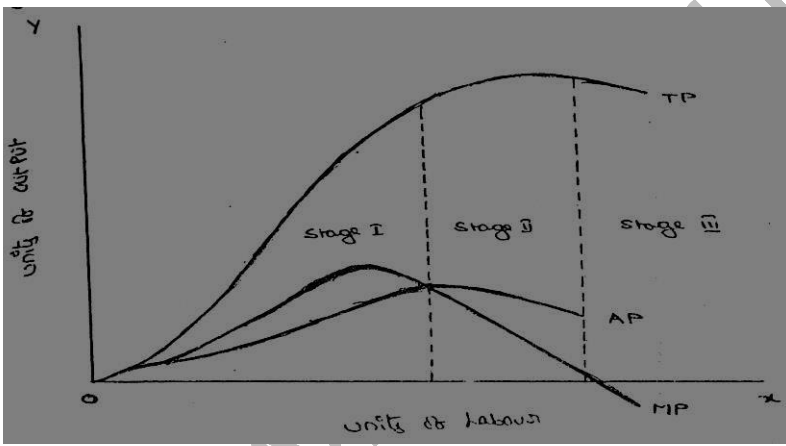
THREE STAGES OF LAW:

The behaviours of the Output when the varying quantity of one factor is combines with a fixed quantity of the other can be divided into three district stages. The three stages can be better understood by following the table

FIXED FACTOR	VARIABLE FACTOR (LABOUR)	TOTAL PRODUCT	AVERAGE PRODUCT	MARGINAL PRODUCT	STAGES
1	1	100	100	-	Stage I
1	2	220	120	120	
1	3	270	90	50	
1	4	300	75	30	Stage II
1	5	320	64	20	
1	6	330	55	10	
1	7	330	47	0	Stage III
1	8	320	40	-10	

Above table reveals that both average product and marginal product increase in the beginning and then decline of the two marginal products drops of faster than average product. Total product is maximum when the farmer employs 6thworker, nothing is produced by the7th worker and its marginal productivity is zero, whereas marginal product of 8thworker is '-10', by just creating credits8thworker not only fails to make a positive contribution but leads to a fall in the total output.

Production function with one variable input and the remaining fixed inputs is illustrated as below



From the above graph the law of variable proportions operates in three stages.

In the first stage, total product increases at an increasing rate .The marginal product in this stage increases at an increasing rate resulting in a greater increase in total product .The average product also increases. This stage continues up to the point where average product is equal to marginal product .The law of increasing returns is in operation at this stage .The law of diminishing returns starts operating from the second stage awards. At the second stage total product increases only at a diminishing rate. The average product also declines.

The second stage comes to an end where total product becomes maximum and marginal product becomes zero.

LAW OF RETURNS OF SCALE:

The law of returns to scale explains the behaviour of the total output in response to change in the scale of the firm, i.e., in response to a simultaneous to changes in the scale of the firm, in response to a simultaneous and proportional increase in all the inputs. More precisely, the Law of returns to scale explains how a simultaneous and proportionate increase in all the inputs affects the total output at its various levels.

When a firm expands, its scale increases all its inputs proportionally, then technically there are three possibilities.

(i)The total output may increase proportionately

(ii) The total output may increase more than proportionately and

(iii) The total output may increase less than proportionately.

TYPES OF RETURNS TO SCALE

INCREASING RETURN TO SCALE: If increase in the output is greater than the proportional increase in the inputs, it means increasing return to scale.

CONSTANT RETURNS TO SCALE: If increase in the total output is proportional to the increase in input, it means constant returns to scale.

DIMINISHING RETURNS TO SCALE: If increase in the output is less than proportional increase in the inputs, it means diminishing returns to scale.

Increasing returns to scale (Inputs 10% increase – Outputs15% increase) Constant returns to scale (Inputs 10% increase – Outputs 10% increase) Decreasing returns to scale (Inputs10%increase–Outputs 5%increase) Production Function with Two Variable Factors

For the analysis of production function with two variable factors we make use of the concept called isoquants curves which are similar to indifference curves of the theory of demand. Therefore, before we explain the production function with two variable factors and returns to scale, we shall explain the concept of isoquants (that is, equal product curves) and their properties.

ISOQUANTS:

The term Isoquants is derived from the words 'iso 'and 'quant'– 'Iso' means equal and 'quant' implies quantity. Isoquant therefore means equal quantity. A family of is product curves or isoquants or production difference curves can represent a production function with two variable inputs , which are substitutable for one another within limits.

Isoquants are the curves, which represent the different combinations of inputs producing a particular quantity of output. Any combination on the Isoquant represents the some level of output.

For a given output level firm's production become Q=f(L,K)

Where 'Q', is the units of output is a function of the quantity of two inputs 'L' and 'K'.

Thus an Isoquant shows all possible combinations of two inputs, which are capable of producing equal or a given level of output .Since each combination yields same output, the producer becomes indifferent towards these combinations.

Assumptions:

There are only two factors of production, viz. labour and capital.

The two factors can substitute each other up to certain limit

The Shape of the Isoquant depends upon the extent of substitutability of the two inputs.

The technology is given over a period.

An Isoquant may be explained with the help of an arithmetical example .Labour is on the X-axis and capital is on the Y-axis. IQ is the ISO-Product curve which shows all the alternative combinations A,B, C,D,E which can produce 50 quintals of a product.

Combinations	Labour(units)	Capital(Units)	Output (quintals)
A	1	12	50
B	2	8	50
C	3	5	50
D	4	3	50
E	5	2	50

The concept of isoquant can be easily understood from Table 17.1. It is presumed that two factors labour and capital are being employed to produce a product. Each of the factor combinations A. B, C,D and E produces the same level of output, say 100 units. To start with, factor combination A consisting of1 unit of labour and 12 units of capital produces the given 100 units of output.

Similarly, combination B consisting of 2 units of labour and 8 units of capital, combination C consisting of 3 units of labour and 5 units of capital, combination D consisting of 4 units oflabourand3 units of capital ,combination E consisting of 5 units of labour and 2 units of capital are capable of producing the same amount of output ,i.e., 100 units. In the above graph we have plotted all these combinations and by joining them we obtain an isoquant showing that every combination represented on it can produce 100 units of output.

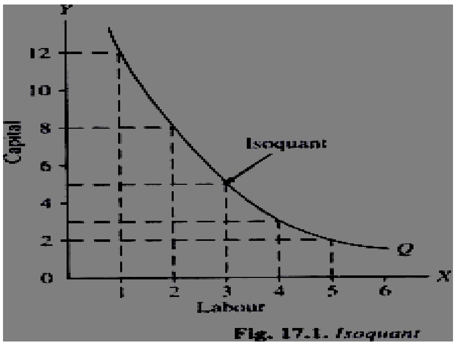


Fig. 17.1. *Isoquant*

Though isoquants are similar to be indifference curves of the theory of consumer's behaviour, there is one important difference between the two. An indifference curve represents all those combinations of two goods which provide the same satisfaction or utility to a consumer but no attempt is made to specify the level of utility in exact quantitative terms it stands for. This is so because the cardinal measurement of satisfaction or utility in unambiguous thermos is not possible. That is why we usually label indifference curves by ordinal numbers as I,II,III etc. indicating that a higher indifference curve represents a higher level of satisfaction than a lower one ,but the information as to how much one level of satisfaction is greater than another is not provided

P .On the other hand, we can label isoquants in the physical units of output without any difficulty. Production of a good being a physical phenomenon lends itself easily to absolute measurement in physical units. Since each isoquant represents a specified level of production, it is possible to say by how much one isoquant indicates greater or less production than another.

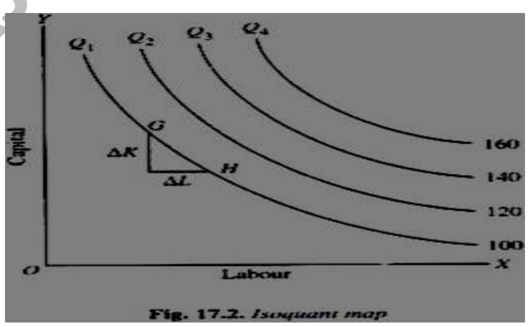


Fig. 17.2. *Isoquant map*

The above figure we have drawn an isoquant- map or equal –product map with a set of four isoquants which represent 100 units, 120 units, 140 units and 160 units of output respectively. Then from this set of isoquants it is very easy to judge by how much production level on one isoquant curve is greater or less than on another.

ISOQUANTS OF PERFECT SUBSTITUTES AND COMPLEMENTS:

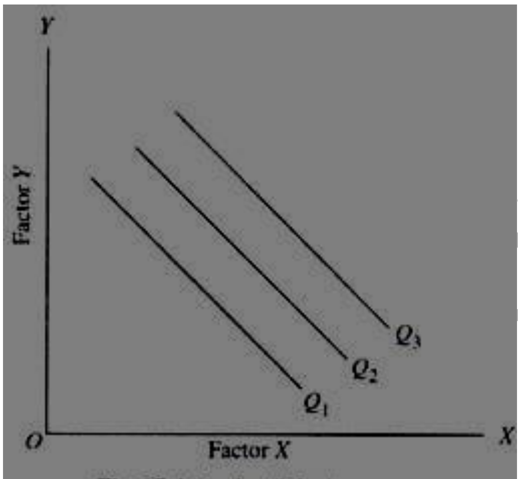


Fig. 17.4. *Perfect Substitutes*

THE FOLLOWING ARE THE IMPORTANT PROPERTIES OF ISOQUANTS:

Isoquants, like indifference curves, slope downward from left to right (i.e., they have a negative slope):

This is so because when the quantity of a factor, say labour, is increased, the quantity of other capital i.e., capital must be reduced so as to keep output constant on a given isoquant.

NO TWO ISOQUANTS CAN INTERSECT EACH OTHER:

If the two isoquants, one corresponding to 20 units of output and the other to

30 units of output intersect each other, there will then be a common factor combination corresponding to the point of intersection.

It means that the same factor combination which can produce 20 units of output according to one isoquant can also produce 30 units of output according to the other isoquant. But this is quite absurd. How can the same factor combination produce two different levels of output, technique of production remaining unchanged

ISOQUANTS, LIKE INDIFFERENCE CURVES, ARE CONVEX TO THE ORIGIN:

The convexity of isoquant curves means that as we move down the curve successively smaller units of capital are required to be substituted by a-given increment of labour so as to keep the level of output unchanged .Thus , the convexity of equal product curves is due to the diminishing marginal rate of technical substitution of one factor for the other.

Do not touch any axis: the isoquant touches neither X- axis nor Y- axis, as both inputs are required to produce a given product.

MARGINAL RATE OF TECHNICAL SUBSTITUTION:

Marginal rate of technical substitution in the theory of production is similar to the concept of marginal rate of substitution in the indifference curve analysis of consumer's demand. Marginal rate of technical substitution indicates the rate at which factors can be substituted at the margin without altering the level of output.

More precisely, marginal rate of technical substitution of labour for capital may be defined as the number of units of capital which can be replaced by one unit of labour ,the level of output remaining unchanged .The concept of marginal rate of technical substitution can be easily understood from below table

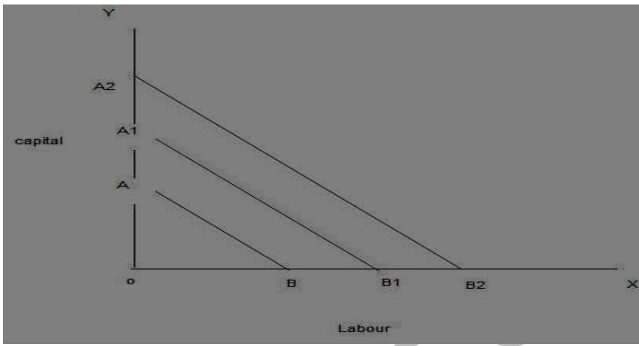
Combinations	Labour(units)	Capital(Units)	Output (quintals)	MRTS
A	1	12	50	----
B	2	8	50	4:1
C	3	5	50	3:1
D	4	3	50	2:1
E	5	2	50	1:1

ISO COST CURVE

Iso cost curve is the locus trace doubt by various combinations of L and K ,each of which costs the producer the same amount of money (C) Differentiating equation with respect to L, we have DK / DL = w/r. This gives the slope of the producer's budget line (iso cost curve).Iso cost line shows various combinations of labour and capital of that the firm can buy for a given fact or prices .The slope of isocost line = PL/Pk. In this equation, PL is the price of labour and P k is the price of capital .The slope of isocost line indicates the ratio of the factor prices .A set of isocost lines can be drawn for different levels of factor prices, or different sums of money. The is cost line will shift to the right when money spent on factors increases or firm could buy more as the factor prices are given.

SLOPE OF ISO COST LINE: With the change in the factor prices the slope of iso cost lien will change. If the price of labour falls the firm could buy more of labour and the line will shift away from the origin .The slope depends on the prices off actors of production and the amount of money which the firm spends on the factors .When the amount of money spent by the firm changes, the is cost line may shift but its slope remains the same. A change in factor price makes changes in the slope of isocost lines as shown in the figure.

LEAST COST COMBINATION OF INPUTS



A given level of output can be produced using many different combinations of two variable inputs. In choosing between the two resources, the saving in the resource replaced must be greater than the cost of resource added. The principle of least cost combination states that if two input factors are considered for a given output then the least cost combination will have inverse price ratio which is equal to their marginal rate of substitution.

Where the slope of isoquant is equal to that of is cost , there lies the lowest point of cost of production. The below graph explains the same

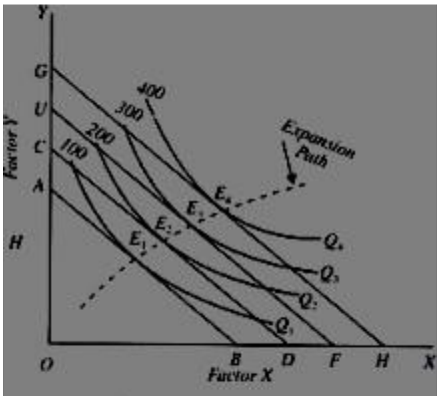


Fig. 18.8. Expansion Path

RETURNS TO FACTORS

Returns to factors are also called fact or productivities. Productivity is the ratio of output to the input. Factor productivity refers to the short-run relationship of input and output. The productivity of one unit of a factor of production will be equal to the output it can generate. The productivity of a particular factor is measured with the assumption that the other factors are not changed or remain unchanged .Only that particular factor under study is changed.

Returns to factors refer to the output or return generated as a result of change in one or more factors, keeping the other factors unchanged. Given a percentage of increase or decrease in a particular factor such as labour ,is it yielding proportionate increase or decrease in production. This is analysed in 'returns to factors.'

The change in productivity can be measured in terms of

TOTAL PRODUCTIVITY : The total output generated at varied levels of input of a particular factor(while other factors remain constant), is called total physical product.

AVERAGE PRODUCTIVITY: The total physical product divided by the number units of that particular factor used yields average productivity.

MARGINAL PRODUCTIVITY : The marginal physical product is the additional output generated by adding an additional unit of the factor under study, keeping the other factors constant.

The total physical product increases along with an increase in the inputs. However, the rate of increase is varied, not constant. The total physical product at first increases at an increasing rate because of the law of increasing return to scale, and later its rate of increase declines because of the law of decreasing returns to scale.

COBB-DOUGLAS PRODUCTION FUNCTION:

Production function of the linear homogenous type is invested by Jaunt wick sell and first tested by C.

W.Cobb and P.H Douglas in 1928.This famous statistical production function is known as Cobb-Douglas production function .Originally the function is applied on the empirical study of the American manufacturing industry. Cobb Douglas production function takes the following mathematical form.
Y = (ALBK1-B)

Where Y=output, K=Capital, L=Labour A,B ∞=positive constant The function estimated for the USA by Cobb and Douglas is

Y=(1.01L0.75K0.25) R2=0.9409

The production function shows that one per cent change in labour input, capital remaining the same, is associated with a 0.75 per cent change in output. Similarly, one per cent change in capital, labour remaining the same, is associated with a 0.25 per cent change in output.

The co efficient of determination R2 means that 94 per cent of the variations on the dependent variable were accounted for by the variations in the independent variables (L and c).

ASSUMPTIONS:

It has the following assumptions.

The function assumes that output is the function of two factors viz. capital and labour.

It is a linear homogenous production function of the first degree.

The function assumes that the logarithm of the total output of the economy is a linear function of the logarithms of the labour force and capital stock.

There are constant returns to scale.

All inputs are homogenous.

There is perfect competition.

There is no change in technology.

ECONOMIES OF SCALE

Production may be carried on a small scale or on a large scale by a firm. When a firm expands its size of production by increasing all the factors, it secures certain advantages known as economies of production. Marshall has classified these economies of large-scale production into internal economies and external economies.

Internal economies are those, which are opened to a single factory or a single firm independently of the action of other firms. External economies are those benefits, which are shared in by a number of firms or industries when the scale of production in an industry or groups of industries increases.

Causes of internal economies:

Internal economies are generally caused by two factors

p.1.1. Indivisibilities

p.1.2. Specialization.

INDIVISIBILITIES:

Many fixed factors of production are indivisible in the sense that they must be used in a fixed minimum size. For instance, if a worker works half the time, he may be paid half the salary. But he cannot be chopped into half and asked to produce half the current output. Thus as output increases the indivisible factors which were being used below capacity can be utilized to their full capacity thereby reducing costs. Such indivisibilities arise in the case of labour, machines, marketing, finance and research.

SPECIALIZATION:

Division of labour, which leads to specialization, is another cause of internal economies. Specialization refers to the limitation of activities within a particular field of production. Specialization may be in labour, capital, machinery and place. For example, the production process may be split into four departments relation to manufacturing, assembling, packing and marketing under the charge of separate managers who may work under the overall charge of the general manger and coordinate the activities of the for departments. Thus specialization will lead to greater productive efficiency and to reduction in costs.

INTERNAL ECONOMIES:

INTERNAL ECONOMIES MAY BE OF THE FOLLOWING TYPES.

TECHNICAL ECONOMIES.

Technical economies arise to a firm from the use of better machines and superior techniques of production .As a result ,production increases and per unit cost of production falls. A large firm, which employs costly and superior plant and equipment, enjoys a technical superiority over a small firm. Another technical economy lies in the mechanical advantage of using large machines. The cost of operating large machines is less than that of operating mall machine. More over a larger firm is able to reduce it's per unit cost of production by linking the various processes of production. Technical economies may also be associated when the large firm is able to utilize all its waste materials for the development of by-products industry. Scope for specialization is also available in a large firm. This increases the productive capacity of the firm and reduces the unit cost of production.

MANAGERIAL ECONOMIES:

These economies arise due to better and more elaborate management, which only the large size firms can afford .There may be a separate head for manufacturing, assembling, packing, marketing, general administration etc. Each department is under the charge of an expert. Hence the appointment of experts, division of administration into several departments, functional specialization and scientific co- ordination of various works make the management of the firm most efficient.

MARKETING ECONOMIES:

The large firm reaps marketing or commercial economies in buying its requirements and in selling its final products. The large firm generally has a separate marketing department. It can buy and sell on behalf of the firm, when the market trends are more favourable. In the matter of buying they could enjoy advantages like prefer entail treatment, transport concessions, cheap credit, prompt delivery and fine relation with dealers. Similarly it sells its products more effectively for a higher margin of profit.

FINANCIAL ECONOMIES:

The large firm is able to secure the necessary finances either for block capital purposes or for working capital needs more easily and cheaply. It can barrow from the public, banks and other financial institutions at relatively cheaper rates. It is in this way that a large firm reaps financial economies.

RISK BEARING ECONOMIES:

The large firm produces many commodities and serves wider areas. It is, therefore, able to absorb any shock for its existence. For example, during business depression, the prices fall for every firm. There is also a possibility for market fluctuations in a particular product of the firm. Under such circumstances the risk- bearing economies or survival economies help the bigger firm to survive business crisis.

ECONOMIES OF RESEARCH:

A large firm possesses larger resources and can establish it's own research laboratory and employ trained research workers. The firm may even invent new production techniques for increasing its output and reducing cost.

ECONOMIES OF WELFARE:

A large firm can provide better working conditions in-and out-side the factory. Facilities like subsidized canteens, crèches for the infants, recreation room, cheap houses, educational and medical facilities tend to increase the productive efficiency of the workers, which helps in raising production and reducing costs.

EXTERNAL ECONOMIES:

Business for men joys a number of external economies, which are discussed below:

ECONOMIES OF CONCENTRATION:

When an industry is concentrated in a particular area, all the member firms reap some common economies like skilled labour, improved means of transport and communications, banking and financial services ,supply of power and benefits from subsidiaries. All these facilities tend to lower the unit cost of production of all the firms in the industry.

ECONOMIES OF INFORMATION

The industry can set up an information centre which may publish a journal and pass on information regarding the availability of raw materials, modern machines, export potentialities and provide other information needed by the firms. It will benefit all firms and reduction in their costs.

ECONOMIES OF WELFARE:

An industry is in a better position to provide welfare facilities to the workers. It may get land at concessional rates and procure special facilities from the local bodies for setting up housing colonies for the workers. It may also establish public health care units, educational institutions both general and technical so that a continuous supply of skilled labour is available to the industry. This will help the efficiency of the workers.

ECONOMIES OF DISINTEGRATION:

The firms in an industry may also reap the economies of specialization. When an industry expands, it becomes possible to spilt up some of the processes which are taken over by specialist firms. For example ,in the cotton textile industry, some firms may specialize in manufacturing thread, others in printing, still others in dyeing, some in long cloth, some in dhotis ,so me in shirting etc. As a result the efficiency of the firms specializing in different fields increases and the unit cost of production falls.

Thus internal economies depend upon the size of the firm and external economies depend upon the size of the industry.

UNIT - IV

COST ANALYSIS

COST -INTRODUCTION

Cost refers to the expenditure incurred to produce a particular product or service.

All costs involve a sacrifice of some kind or other to acquire some benefit.

Costs may be monetary or nonmonetary, tangible or non-tangible, determined subjectively or objectively.

Cost of production normally includes the cost of raw materials, labour, and other expenses. This cost is known as total cost (TC).

TC is compared with the total revenue (TR) realized on the sale of the products manufactured.

This difference is termed as profit/loss

It is used for analysing the cost of a project in short and long run.

- Long run vs. short run costs
- Fixed vs. variable costs
- Semi fixed vs. semi variable costs
- Marginal costs
- Controllable Vs. non controllable costs
- Opportunity vs. outlay costs
- Incremental vs. sunk costs
- Out of pocket vs. book costs
- Explicit vs. implicit Costs
- Replacement cost vs. historical cost
- Past vs. future costs
- Separable vs. joint costs
- Accounting vs. economic costs

- Urgent vs. post pond able costs
- Escapable vs. unavoidable costs

LONG RUN VS SHORT RUN COSTS

- **Short run** costs are costs that vary with variation in output. Short run costs are the same as variable costs
- **Long run costs** are costs that are incurred on fixed assets like plant, machinery, etc

It is to be noted that running costs and depreciation of capital assets are included under short run costs.

FIXED COSTS (FC)

Fixed Cost denotes the costs which do not vary with the level of production. FC is independent of output.

E.g. : Depreciation ,Interest Rate ,Rent ,Taxes Total fixed cost(TFC):

All costs associated with the fixed input. Average fixed cost per unit of output:

AFC = TFC /Output

VARIABLE COSTS (VC)

Variable Costs is the rest of total cost, the part that varies as you produce more or less. It depends on Output.

E.g.: Increase of output with labour .Total variable cost (TVC): All costs associated with the variable input.

Average variable cost- cost per unit of output: AVC =TVC/ Output Semi fixed Vs semi variable costs

Semi variable costs are also called semi fixed costs. Semi fixed or semi variable costs are fixed up to a given level land beyond that they vary.

For example electricity bill, telephone bill etc… Marginal Costs

The additional cost incurred from producing an additional unit of output: MC=ΔTC

/ΔOutput

MC=ΔTVC/ΔOutput

CONTROLLABLE VS. NON=CONTROLLABLE COSTS

Controllable costs are those costs that can be influenced by the action or authority of a plant or any other official.

Sometimes few costs are not controllable like direct costs. For example cost of raw material, wages etc..

OPPORTUNITY VS OUTLAY COSTS

The opportunity cost may be defined as the expected returns form the second best use of there sources which foregone due to the scarcity of resources.

The opportunity cost is also called alternative cost. Had the resource available been unlimited, there would be no opportunity cost.

Actual Costs or Outlay Costs or Absolute Costs mean the actual amount of expenses incurred for producing or acquiring a good or service.

These are the costs which are generally recorded in the books of accounts for cost or financial purposes such as payment for wages, raw-materials purchased, other expenses paid etc.

INCREMENTAL VS. SUNK COSTS

INCREMENTAL COST:

Is the additional cost due to change in the level or nature of business activity.

The question of this type of cost, would not arise when a business has to be set up a fresh. It arises only when a change is contemplated in the existing business.

SUNK COST:

Is one which is not affected or altered by a change in the level or nature of business activity. It will remain the same whatever the level of activity maybe.

OUT OF POCKET VS. BOOK COSTS

OUT OF POCKET COSTS:

Refer to costs that involve current cash payments to outsiders. On the other hand book costs such as depreciation, do not require current cash payments.

BOOK COSTS

These can be converted into out of pocket costs by selling the assets and having them on work Rent would then replace depreciation and interest, while understanding expansion; book costs do not come into the picture until the assets are purchased.

EXPLICIT VS. IMPLICIT COSTS

"The total cost of production of any particular goods can be said to include expenditure or explicit costs and non-expenditure or implicit costs."

Explicit cost involve payment of cash.

Implicit costs do not involve any Replacement cost / historical cost

Historical Costs mean the cost of an asset or the price originally paid for it.

Replacement cost means the price that would have to be paid currently

For acquiring the same plant.

PAST VS. FUTURE COSTS

Past Costs are actual costs or historical costs are records of past costs.

Future costs are based on forecasts. The costs relevant for most managerial decisions are forecasts of future costs or comparative conjunctions concerning future situations

SEPARABLE VS. JOINT COSTS

A separable or Direct or Traceable Cost is one which can be identified easily and indisputably with a unit of operation, i.e., costing unit/cost centre.

JointorIndirectorCommonCostsarenottraceabletoanyplant,department or operation as well as those that are not traceable to indirect final products.

ACCOUNTING VS. ECONOMIC COSTS

Accounting cost refers to what are recorded as expenses in the books of accounting records

Economic costs include the same explicit costs that accounting costs use in calculations, but economic costal so include implicit costs. Implicit costs are those values that are not listed on the ledger, and they are assumed by the business to utilize resources.

URGENT VS. POST POTABLE COSTS

Urgent costs are those costs which must be incurred in order to continue operations of the firm. For example, the costs of materials and labour which must be incurred if production is to take place.

Post potable costs refer to those costs which can be postponed at least for some time e.g. maintenance relating to building and machinery. Railways usually make use of this distinction. They know that the maintenance of rolling stock and permanent way can be postponed for some time.

ESCAPABLE VS. UNAVOIDABLE COSTS

Escapable costs or An avoidable cost is a cost that is not incurred if the activity is not performed.

For example, supply expenses are avoidable costs. You can simply decide to not buy the supplies, and no expense will be incurred.

These costs are often identified as variable costs, which vary based on production. If there is no production, there is no cost.

For example, if a manufacturing plant shuts down, its avoidable costs (i.e. variable costs), like materials or supplies, will be $0, but it still needs to pay for idle equipment, property taxes, lease payments, etc.

These costs are often considered fixed costs. Fixed costs are expenses that do not depend on production.

COST OUTPUT RELATIONSHIP / COST FUNCTION

The costs and output are related .The cost of production depends upon several factors such as volume of production, relation between the costs and output, prices and productivity of the inputs such as land, labour ,capital and so forth, and the time scale.

The cost – output relationship significantly differs in the short run and in the long run. It is because, in the short run, the costs can be classified into fixed costs and variable costs. The cost-output relationship in the short run is governed by certain restrictions in terms of fixed costs.

COST-OUTPUT RELATION DURING SHORT RUN OR SHORT RUN COST CURVES:

Time element plays an important role in price determination of a firm. During short period two types of factors are employed. One is fixed factor while others are variable factors of production. Fixed factor of production remains constant while with the increase in production ,we can change variable inputs only because time is short in which all the factors cannot be varied.

Raw material, semi-finished material, unskilled labour, energy, etc., are variable inputs which can be changed during short run. Machines, capital, infrastructure, salaries of managers and technical experts are included in fixed inputs. During short period an individual firm can change variable factors of production according to requirements of production while fixed factors of production cannot be changed.

The cost-output relation during short period can be studied with the help of short run cost curves based on short run costs as given below:

SHORT RUN TOTAL COSTS:

SHORT RUN TOTAL COSTS OF A FIRM ARE OF FOLLOWING TYPES:

TOTAL COSTS:

Those costs which are incurred by a firm in the production of any commodity on the basis of total fixed cost and total variable cost.

TOTAL COSTS ARE CALCULATED ON THE BASIS OF THE FOLLOWING FORMULA:

Total cost (TC)=Total fixed cost(TFC)+Total variable cost(TVC)

Total costs change due to change in the total variable costs only during short period because total fixed costs (TFC) remain constant.

SHORT RUN TOTAL COSTS CAN BE SEEN FROM THE FOLLOWING TABLE:

Table 1
Short Run Total Costs

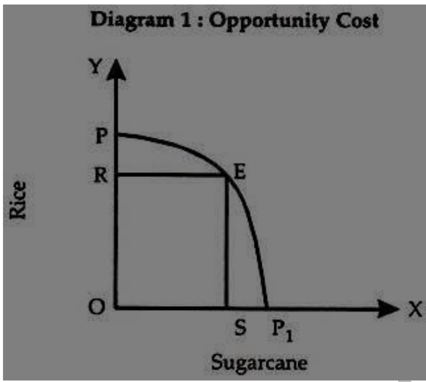
Output (Units)	Total Fixed Cost (TFC) Rs.	Total Variable Cost (TVC) Rs.	Total Cost (TC) Rs.
0	100	0	100
1	100	30	130
2	100	60	160
3	100	80	180
4	100	90	190
5	100	100	200
6	100	120	220
7	100	150	250
8	100	190	290
9	100	240	340
10	100	320	420

The table reveals that total fixed cost remain constant when the production is zero or its is increasing while total variable cost is zero when production is zero and it changes with the change in output and total cost is the aggregate of total fixed cost and total variable cost.

TOTAL FIXED COST (TFC):

Those costs which remain constant when the output is zero as well as it is increasing are called total fixed costs. Such costs are borne by the firm whether there is production or not. These costs are not concerned with the production of a commodity. Plant, land and building, machinery, tools, equipment, implements, contractual rent, insurance fee, maintenance cost, property tax , interest on the capital, manager’s salary, etc., are the items which are included in total fixed costs.

These costs are borne even there is zero production during short period. The Table1 shows when production is zero the total fixed cost is Rs.100 and when it is 10 units even then it is Rs.100.Hence, total fixed costs remain constant .These costs



are also known as supplementary costs, general costs , indirect costs and overhead costs. TFC is shown in Diagram 1 which is perfectly horizontal to OX-axis.

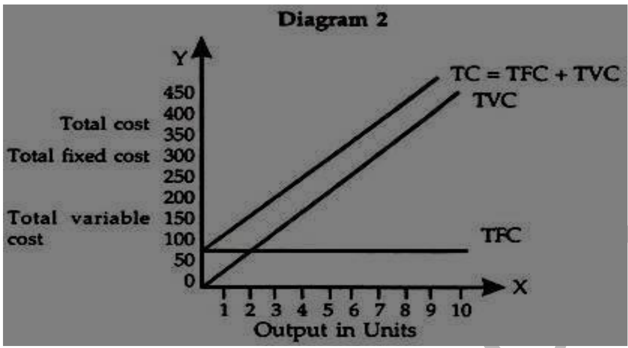
TOTAL VARIABLE COSTS (TVC):

Those costs which vary with the production of a commodity during short period and they have direct relation with the change in production . When production is zero these costs will be zero and when production increases they will move in the same direction. These costs are incurred on raw material, direct wages and expenses on energy or power. Variable costs are also called prune costs or direct costs. Total variable costs show an increasing trend as shown in Diagram1.Thus,totalcostsare the summation (aggregates) of total fixed costs and total variable costs. All these costs are related to short run production. They are shown in the Diagram 2 on the basis of the Table 2.

Table 2
Short Run Output Relation (Rs.)

Output (Units)	Total Costs			Average costs			
	TFC	TVC	TC (TFC+ TVC)	AFC	AVC	AC (AFC+ (AVC)	MC
1	2	3	4	5	6	7	8
0	100	0	100	0	0	0	-
1	100	30	130	100	30	130	30
2	100	60	160	50	30	80	30
3	100	80	180	33.3	26.7	60	20
4	100	90	190	25	22.5	47.5	10
5	100	100	200	20	20.0	40.0	10
6	100	120	220	16.66	20.0	36.66	20
7	100	150	250	14.3	21.4	35.7	30
8	100	190	290	12.5	23.75	36.25	40
9	100	240	340	11.1	26.67	37.7	50
10	100	320	420	10.0	32.0	42.0	80

The Diagram 2 shows TC, TFC and TVC. TFC is parallel to OX-axis and it remains constant whether production is zero or it is 10 units. TVC starts from zero production where it is zero and goes on increasing with the increase in output.TC is the total of TFC and TVC. When production is zero total cost is equal to TFC and it increases with increase in production. The difference between TVC and TC is equivalent to TFC which remains constant.



AVERAGE COSTS OR PER UNIT COSTS:

During short period average costs or per unit costs can be divided into following categories:

- **Average fixed costs (AFC)**
- **Average variable costs (AVC)**
- **Average Costs (AC)**
- **Marginal Cost (MC)**

AVERAGE FIXED COST (AFC):

The average fixed cost is the total fixed cost divided by the volume of output. There is an inverse relation between output and average fixed cost .With the increase in output average fixed cost decreases and with the decrease in output the average fixed cost will increase. The shape of average fixed cost curve becomes rectangular hyperbola with the increase in output.

It is calculated from the following formula:

AFC=TFC/O

O is volume of output AFC and TFC are average fixed cost and total fixed cost.

AVERAGE VARIABLE COST (AVC):

The average variable cost is total variable cost divided by the volume of output. Average variable cost fall s with the increase in output, reaches at its minimum and then starts rising. By the operation of law of increasing returns the AVC decreases, and by the operation of constant returns leads to constancy in AVC and the law of diminishing returns leads to increase in AVC. The shape of AVC is U-shaped because of the operation of the laws of returns during short period.

THE AVC IS CALCULATED BY THE FORMULA GIVEN BELOW:

AVC=TVC/O

AVC and TVC are average variable cost and total variable cost while O is the volume of output.

AVERAGE COST (AC):

Average cost is also called average total cost (ATC) during short period because it is the aggregate of AFC and AVC. AC can be calculated from total cost (TC) divided by the volume of output or by aggregating AVC and AFC.

THE FOLLOWING IS THE FORMULA OF CALCULATING AC:

AC=TC/O

AC and TC are average cost and total cost while O is the volume of output.

ANOTHER FORMULA FOR THE CALCULATION OF AC IS AS GIVEN UNDER:

AC=AFC+AVC

The AC curve decreases with the increase in output and remains constant up to a point and there after it increases with the increase in output .Its shape is U-shaped because of the operation of the laws of return during short period.

MARGINAL COST (MC):

It is an addition to total cost by producing an additional unit of output. It can be calculated as the change in total cost divided by an additional unit change in the output.

THE FORMULA FOR ITS CALCULATION IS AS GIVEN BELOW:

$MC=\Delta TC/\Delta O$

MC is marginal cost, ΔTC is change in TC and ΔO is change in the volume of output.

For example, if the total cost (TC) of 5 units of a commodity is Rs. 550 and 6 units of a commodity is Rs 600, then the marginal cost of 6th units is Rs. 50.

IT CAN BE CALCULATED ON THE BASIS OF THE ABOVE FORMULA AS GIVEN UNDER:

$MC=\Delta TC/\Delta O=50/1=50$orRs. 50

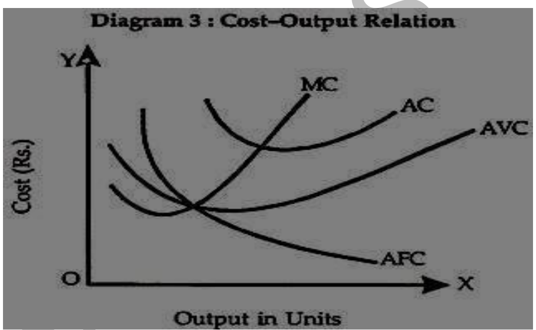
The MC cost changes with the change in AVC and it is independent of fixed cost. In the beginning the MC falls, reaches at its minimum and thereafter continuously rises.MC is also U- shaped. The MC curve cuts the AC and AVC curves at their minimum points.

Thecost-outputrelationduringshortperiodcanbeseenfromTable2.

The table reveals the trends in total costs (TFC and TVC), average cost (AFC and TVC) and MC. TFC remains constant and TVC goes on increasing and consequently TC is also increasing. AFC is decreasing, but it is positive. AVC decreases, remains constant and thereafter increases. AC also decreases, remains constant and shows an increasing trend. MC increases, remains constant and thereafter shows an increasing trend.

ON THE BASIS OF THE TABLE 2
we can show the costs and output relation
SHORT PERIOD IN THE FOLLOWING DIAGRAM:

The diagram shows AC,AFC,AVC and MC on OY-axis and units of output on OX-axis.



AC, MC and AVC are U-shaped curves. The U-shaped curves are on account of the operation of the laws of return during short period. AFC curve shows a decreasing trend. MC curve passes through the minimum points of AC and AVC curves.

THERE IS A CLOSE RELATIONSHIP BETWEEN AC AND MC AS GIVEN BELOW:

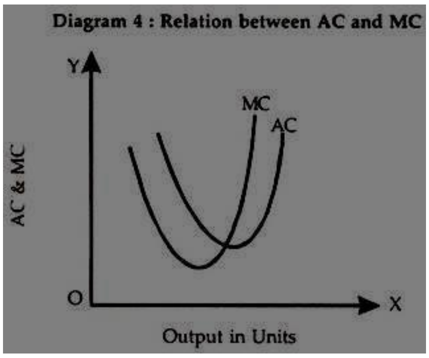
AC and MC fall in the beginning but MC falls more rapidly than AC and MC is below AC or AC is greater than MC (AC>MC).

When A Crises, MC also rises but it rises more rapidly than

The AC and MC is greater than AC (MC>AC).

When AC is minimum it is equal to AC. The MC curve cuts the AC curve at its minimum point.

THE RELATION BETWEEN AC AND MC CAN BE SEEN FROM THE FOLLOWING DIAGRAM DURING SHORT PERIOD:



The diagram shows AC and MC on OY-axis and volume of output on OX-axis.

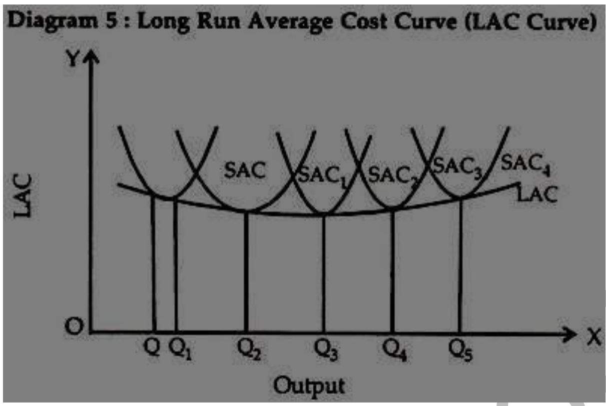
COST-OUTPUT RELATION DURING LONG RUN OR LONG RUN COST CURVES:

Long period gives sufficient time to business managers to change even the scale of production. All the factors of production are variable. All the costs are variable costs and there is no fixed cost .The supply of goods can be adjusted to their demands because scale of production and factors of production can be changed. In the long run we can study the long run average cost curve and long run marginal cost curve.

LONG RUN AVERAGE COST (LAC):

In the long run, all the factors of production are variable and the firm has a variety of choices to select the size of the plants and the factors of production to be employed. Various short run average cost curves represent the various sizes of the plants available to a firm. We can get the long run average cost curve with the help of all the short run average cost curves .The long run average cost curve envelopes all the short run average cost curves in it. It is also called an 'Envelope Curve' or 'Planning Curve'.

THE LONG RUN AVERAGE COST CURVE IS ALSO A FLAT U-SHAPED CURVE AS SHOWN IN THE FOLLOWING DIAGRAM:

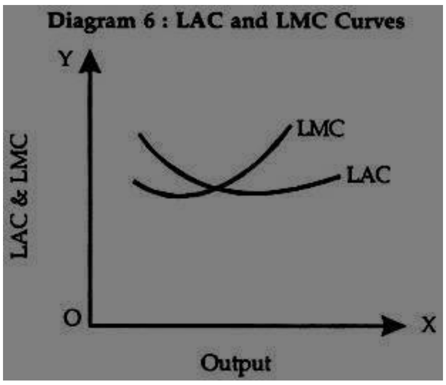


The diagram shows long run cost on OY-axis and output on OX-axis. SAC, SAC1, SAC2, SAC3 and SAC4 are short run average cost curves which represent the different size of plants. LAC has been drawn by combining all those points of least cost of producing the corresponding output. The least per unit cost of production is OQ, OQ1, OQ2, OQ3, OQ4, and OQ5 respectively.

LONG RUN MARGINAL COST (LMC):

The long run marginal cost is an addition to the long run total cost when an additional unit of a commodity is produced .It is calculated as the short run marginal cost is calculated. Long run marginal cost curve is also U-shaped but the fall and rise in the marginal cost curve is not sharp but it is gradual.

The LAC and LMC can be seen from the following diagram:



The diagram shows that LAC and LMC are shown on OY-axis while output is shown on OX-axis. The shape of LAC and LMC are U- shaped .The relation between LAC and LMC is the same as is between short run average cost (SAC) and short run marginal cost(SMC) curves .The LMC curve cuts the LAC curve from its minimum point.

WHY LAC CURVE IS U-SHAPED?

In the short run SAC curve is U-shaped because the laws of return operate but in the long run LAC is also U-shaped because the laws of return of scale operate, namely ,law of increasing returns to scale, law of constant returns to scale and the law of diminishing returns to scale.

As the level of output is expanded or scale of operation is increased by the large firm they will enjoy economies of scale but if these firms produce beyond their installed capacity then they might get diseconomies of scale. Economies of scale bring down the fall in unit cost and diseconomies results into rise in it.

UNIT-V

MARKET ANALYSIS

MARKET–INTRODUCTION

WHAT IS A MARKET?

Market is defined as a place or point at which buyers and sellers negotiate their exchange of well-defined products or services.

Market is a place where buyer and seller meet ,goods and services are offered for the sale and transfer of ownership occurs.

DEFINITION OF MARKET

Market is any area over which buyers and sellers are in close touch with one another, either directly or through dealers ,that the price obtain able in one part of the market affects the prices paid in other parts.- Bentham.

COMPONENTS AND MARKET STRUCTURE

As seen from the definition of market, the components of a market are:

- Sellers (Producer)
- Buyers (Customers)
- Nature of product (Types of Product)
- Conditions of entry and exit
- Negotiation (Price)
- Transfer of Ownership and Product
- Transfer of Money or Equal Value

TYPES OF MARKET

ON THE BASIS OF COMPETITION, A MARKET CAN BE CLASSIFIED IN THE FOLLOWING WAYS:

- Perfect Competition
- Monopoly
- Duopoly
- Oligopoly
- Monopolistic Competition

Table 1 : Features of Market Structures

Features	*(Market Forms)* Perfect Competition	Monopoly	Monopolistic Competition	Oligopoly
1. No. of Firms	Large	One	Varied but not too many	A few
2. Nature of Product	Homoge-neous	One type	Product Differentiation	Homogeneous or Differentiated
3. Entry of Firms	Free	No entry	Free	Restricted
4. Degree of Mono-poly Power	Zero	Full	Limited	Limited due to product differentiation
5. Price Policy of Firm	Price-taker	Price-maker	Price-maker	Price-maker
6. Market Knowledge	Complete	Incomplete	Incomplete	Incomplete
7. Elasticity of Demand	Perfectly elastic	Less elastic	Less elastic	Less elastic
8. AR and MR	Equal	Different	Different	Different
9. Selling Cost	No	Small	Large	Small

PERFECT COMPETITION MARKET:

A perfectly competitive market is one in which the number of buyers and sellers is very large, all engaged in buying and selling a homogeneous product without any artificial restrictions and possessing perfect knowledge of market at a time. In the words of A. Knout so yanks, "Perfect competition is a market structure characterised by a complete absence of rivalry among the individual firms." According to R.G. Lapse, "Perfect competition is a market structure in which all

Firms in an industry are price-taker sand in which there is freedom of entry into, and exit from, industry."

CHARACTERISTICS OF PERFECT COMPETITION:

The following are the conditions for the existence of perfect competition:

LARGE NUMBER OF BUYERS AND SELLERS:

The first condition is that the number of buyers and sellers must be so large that none of the mind individually is in a position to influence the price and output of the industry as a whole. The demand of individual buyer relative to the total demand is so small that he cannot influence the price of the product by his individual action.

Similarly, the supply of an individual seller is so small a fraction of the total output that he cannot influence the price of the product by his factional one .In other words, the individual seller is unable to influence the price of the product by increasing or decreasing its supply .

Price taker: Rather, head supply to the price of the product. He is "output adjuster". Thus no buyer or seller can alter the price by his individual action. He has to accept the price for the product as fixed for the whole industry. He is a "price taker".

FREEDOM OF ENTRY OR EXIT OF FIRMS:

The next condition is that the firms should be free to enter or leave the industry. It implies that whenever the industry is earning excess profits, attracted by these profits some new firms enter the industry. In case of loss being sustained by the industry, some firms leave it.

HOMOGENEOUS PRODUCT:

Each firm produces and sells a homogeneous product so that no buyer has any preference for the product of any individual seller over others. This is only possible if units of the same product produced by different sellers are perfect substitutes. In other words, the cross elasticity of the products of sellers is infinite.

No seller has an independent price policy. Commodities like salt, wheat, cotton and coal are homogeneous in nature. He cannot raise the price of his product. If he does so, his customers would leave him and buy the product from other sellers at the ruling lower price.

The above two conditions between themselves make the average revenue curve of the individual seller or firm perfectly elastic, horizontal to the X-axis. It means that a firm can sell more or less at the ruling market price but cannot influence the price as the product is homogeneous and the number of sellers very large.

ABSENCE OF ARTIFICIAL RESTRICTIONS:

The next condition is that there is complete openness in buying and selling of goods. Sellers are free to sell their goods to any buyers and the buyers are free to buy from any sellers.

Moreover, prices are liable to change freely in response to demand-supply conditions. There are no efforts on the part of the producers, the government and other agencies to control the supply, demand or price of the products. The movement of prices is unfettered.

PROFIT MAXIMISATION GOAL:

Every firm has only one goal of maximising its profits.

PERFECT MOBILITY OF GOODS AND FACTORS:

Another requirement of perfect competition is the perfect mobility of goods and factors between industries. Goods are free to move to those places where they can fetch the highest price. Factors can also move from a low-paid to a high-paid industry.

Perfect Knowledge of Market Conditions:

This condition implies a close contact between buyers and sellers .Buyers and sellers possess complete knowledge about the prices at which goods are being bought and sold, and of the prices at which others are prepared to buy and sell. They have also perfect knowledge of the place where the transactions are being carried on. Such perfect knowledge of market conditions forces the sellers to sell their product at the prevailing market price and the buyers to buy at that price.

Absence of Transport Costs:

Another condition is that there are no transport costs in carrying of product from one place to another. This condition is essential for the existence of perfect Competition which requires that a commodity must have the same price everywhere at any time. If transport costs are added to the price of the product, even a homogeneous commodity will have different prices depending upon transport costs from the place of supply.

ABSENCE OF SELLING COSTS:

Under perfect competition, the costs of advertising, sales-promotion, etc. do not arise because all firms produce a homogeneous product.

PRICE DETERMINATION UNDER PERFECT COMPETITION

Under perfect competition, many factors influence the determination of the price of goods. In this article, we will look at the equilibrium of the industry and the equilibrium of a firm as important factors behind price determination under perfect competition.

Relation between Price, TR, MR and AR in Perfect Competition

However, in Perfect Competition, Price (P)=MR=AR.

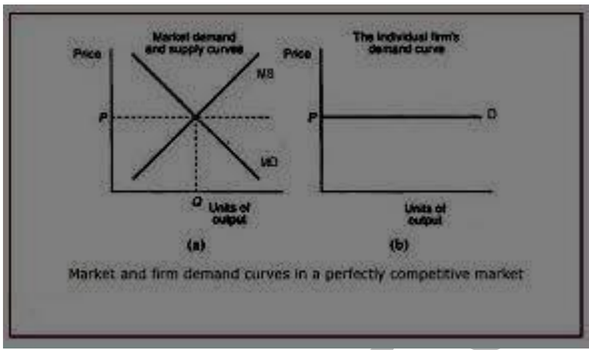
As more units can be sold at the same price, addition to total revenue (ie.MR) is constant and equal to price (P).

Let’s have a look at a firm’s schedule:

As you can note, MR =P=AR.

Since, P= MR, we can rest at the equilibrium condition (MR=MC) of a firm in Perfect Competition as P = MC.

However, it's to be noted that the equilibrium condition of P=MC is applicable only for Perfect Competition where MR=P. In other market structures, MR may not be equal to P, and hence the condition P=MC may not be true.



Market and firm demand curves in a perfectly competitive market

PRICE DETERMINATION UNDER PERFECT COMPETITION CAN BE ANALYSED INTO THREE PERIODS:

- **VERY SHORT PERIOD**
- **SHORT PERIOD**
- **LONG PERIOD.**

VERY SHORT PERIOD:

Refers to a time period in which quantity supplied of a product cannot be increased with increase in its demand.

In simple terms, in very short period of time, the supply of a product is fixed. For example, a confectioner has 20 pastries at a particular time.

After an hour, a customer requires 40 pieces of pastries. In such a case, the confectioner cannot prepare 20 more pastries in an hour and can only supply 20 pastries. Therefore, the supply is fixed, which 20 is in the given example. The price determined in very short period is known as market price.

SHORT PERIOD:

Refers to a time period in which the level of supply of a particular product can be increased ,but only as per the production capacity of an organization .For example, an organization can produce 50 mobile phones in a day. This is the maximum production capacity of the organization.

Suppose the demand of mobile phones increases to 150 per day for three days. In such a scenario ,the organization cannot install new machines or hire more labour in three days to meet the additional demand. Thus, the supply is fixed even in short period and the price determined in this period is known as sub-normal price.

LONG PERIOD:

Refers to a period in which the supply of a product can be increased or decreased with the changing level of demand .In this period, organizations can install new machines or hire more labour to meet the supply requirements.

Generally, in the long period, demand is determined by change in the size of population and change in customer's tastes and preferences.' On the other hand, organizations can reduce production level if there is decrease in demand. Therefore, it can be said that in the long period, the price of a product is influenced by supply. The price in the long period is called normal price.

EQUILIBRIUM OF THE INDUSTRY UNDER PERFECT COMPETITION

In economic terms, an industry consists of many independent firms. Each firm has a number of factories, farms or mines, as required. Each such firm in an industry produces a homogeneous product.

Equilibrium of the industry happens when the total output of the industry is equal to the total demand. In such a scenario, the prevailing price of a commodity is its equilibrium price.

RELATION BETWEEN PRICE, TR, MR AND PERFECT COMPETITION

However, in Perfect Competition,

Price (P)=MR=AR

As more units can be sold at the same price, addition to total revenue (ie.MR) is constant and equal to price (P).

LET'S HAVE A LOOK AT A FIRM'S SCHEDULE:

As you can note, MR=P=AR.

Since, P=MR, we can rest at the equilibrium condition (MR=MC) of a firm in Perfect Competition as P = MC.

However, it's to be noted that the equilibrium condition of P=MC is applicable only for Perfect Competition where MR=P. In other market structures, MR may not be equal to P, and hence the condition P=MC may not be true.

We know that under competitive conditions, the interaction of demand and supply determines the equilibrium price as shown below:

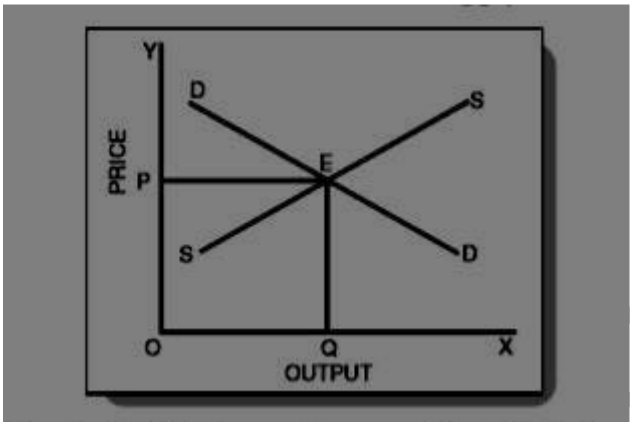


Fig. 1 : Equilibrium of a competitive industry

In Fig. 1 above, OP is the equilibrium price. Further, OQ is the equilibrium quantity sold at that price. Now, the equilibrium price is the price at which both the demand and supply are equal. In other words, no buyer, who wanted to buy at that price ,goes dissatisfied and no seller ,who wanted to sell his goods at that price, goes dissatisfied either.

Note that with the demand

Remaining the same, if the price is higher or lower than OP, then the market is not in equilibrium .Also ,if goods are lesser or higher than the demand, the equilibrium is not attained.

EQUILIBRIUM OF THE PERFECT COMPETITION

A firm is in equilibrium when it maximizes its profits. Hence, the output that offers maximum profit to a firm is the equilibrium output. When a firm is in an equilibrium, there is no reason to increase or decrease the output.

In a competitive market, firms are price-takers .There being the presence of a large number of firms who produce homogeneous products. Therefore, firms cannot influence the price in their individual capacities. They have to follow the price determined by the industry.

The following figure shows a firm's demand curve under perfect competition:

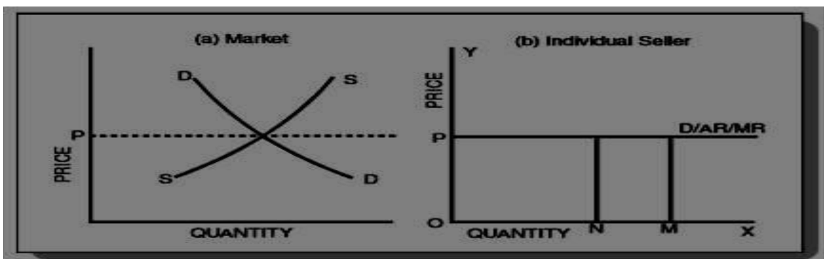


Fig. 2 : The firm's demand curve under perfect competition

FromFig.2above, you can see that the industry price, OP, is fixed throughout the interaction of demand and supply of the industry. Firms have to accept this price. Hence, they are price-takers and NOT price-makers .Hence, they cannot increase or decrease the price OP.

Therefore, the line P acts as a demand curve for such firms .Hence, in a perfect competition, the demand curve of an individual firm is a horizontal line at the level of the industry-set market price. Firms have to choose the level of output that yields maximum profit.

CONDITIONS FOR THE EQUILIBRIUM OF A FIRM

To attain an equilibrium position, a firm must satisfy the following two conditions:

They must ensure that the marginal revenue is equal to the marginal cost (MR = MC).

If MR > MC, the firm has an incentive to expand its production and sell additional units.

If MR < MC, the firm must reduce the output since additional units add more cost than revenue.

The firm gets maximum profits only when MR=MC.

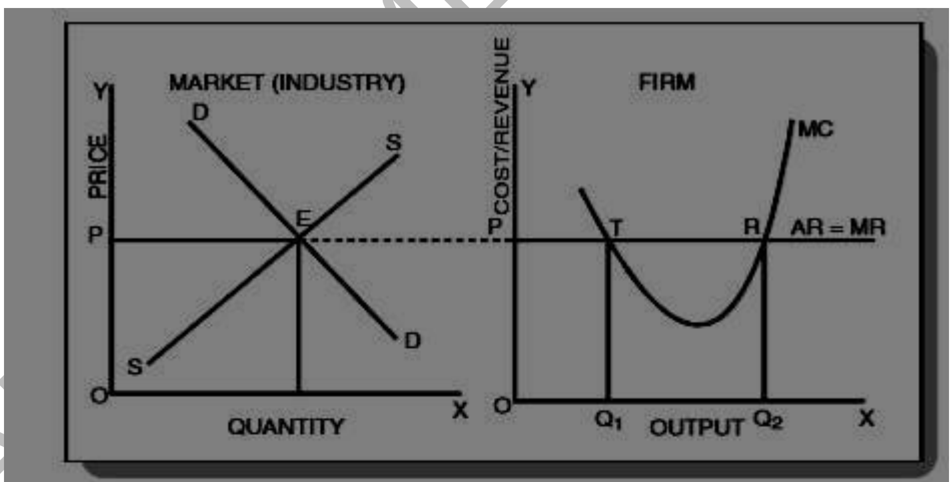


Fig. 3 : Equilibrium position for a firm under perfect competition

The MC curve must have a positives lope and cut the MR curve from below.

In Fig. 3 above, DD is the demand curve and SS is the supply curve.

They equilibrate at point E and set the market price as OP. Under perfect competition, firms adopt OP as the industry price and consider the P-line as the demand curve or AR – average revenue curve (perfectly elastic at P).

Since all units are equally priced, the MR curve is a horizontal line and is equal to the AR line. Observe that the curve MC cuts the MR curve at two points–T and R. At point T, the MC curve cuts the MR curve from above whereas at point R it cuts the MR curve from below. Therefore, according to the conditions of equilibrium of a firm, point R is the point of equilibrium and oq2 is the equilibrium level of output.

SHORT-RUN EQUILIBRIUM OF FIRM AND INDUSTRY

Whether a firm makes abnormal profit or loss depends on the level of AC in the short run equilibrium. It generally consists of 3 cases i.e. abnormal profit, normal profit, and loss.

According to marginal revenue (MR) and marginal cost (MC)approach firm can get equilibrium when it mentioned two conditions which are:

Marginal revenue (MR) must be equal to marginal cost (MC) i.e.MC=MR

Slope of MC curve >Slope of MR curve i.e. MC curve cuts MR curve from below

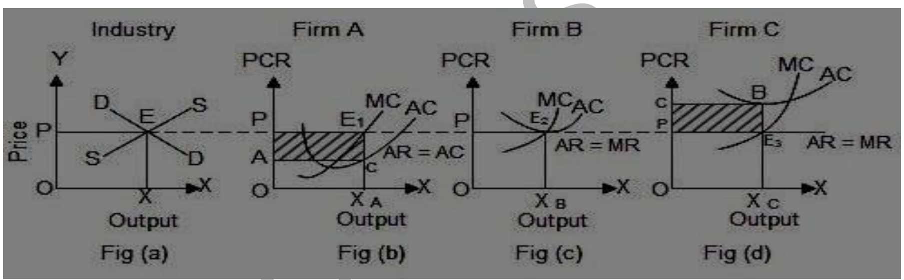


Fig: Short run equilibrium of firm and industry

From the figure, the industry demand curve DD and supply curve SS intersecteachotheratpoint'E'wherethemarketpriceisP.FirmAenjoysabnormal profit as AC lies below equilibrium of the AR curve. So, the shaded region PACE1 is the abnormal profit enjoyed by the firm. Likewise, firm B faces normal profit, as AC is tangent to A R at equilibrium. Finally, firm C bears loss and the shaded region PCBE3 is the loss faced by the firm.

LONG-RUN EQUILIBRIUM OF FIRM AND INDUSTRY

A firm, in the long run, can adjust their fixed inputs. In the long run, under perfect competition, entry and exit are easy and free. All the firms in the perfect competition can earn only normal profit in the long run.

Under perfect competition, the firms could be in long run equilibrium if they fulfill the following conditions:

Long run marginal revenue (LMR)=Long run marginal cost(LMC)

Long run marginal cost (LMC) must cut long run marginal revenue (LMR) from below at equilibrium point.

The slope of LMC must be greater than the slope of LMR.

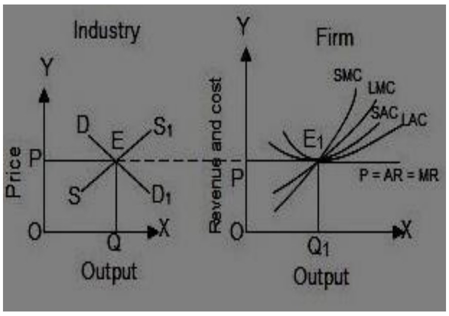


Fig: Long run equilibrium of firm and industry

The given figure shows the equilibrium of firm and industry respectively under perfect competition market .An industry demand curve DD1 and supply curve SS1 intersect each other at point E where the market price is P. At point E, industry determine OP price for OQ quantity of product.

Next figure of firm explains long run equilibrium of competitive firm where LMC and LAC represent long run marginal cost and average cost curves where, at point E, P=LAR=LMR=LMC=LAC respectively .OP price is determined for OQ1 level of output and firm making only normal profit.

MONOPOLY MARKET

Monopoly is a market situation in which there is only one seller of a product with barriers to entry of others. The product has no close substitutes. The cross elasticity of demand with every other product is very low. This means that no other firms produce a similar product .According to D. Salvatore, "Monopoly is the form of market organisation in which there is a single firm selling a commodity for which there are no close substitutes." Thus the monopoly firm is itself an industry and the monopolist faces the industry demand curve.

The demand curve for his product is, therefore, relatively stable and slopes downward to the right, given the tastes ,and incomes of his customers .It means that more of the product can be sold at a lower price than at a higher price. He is a price- maker who can set the price to his maximum advantage.

However, it does not mean that he can set both price and output. He can do either of the two things .His price is determined by his demand curve, once he selects his output level. Or, once he sets the price for his product, his output is determined by what consumers will take at that price. In any situation, the ultimate aim of the monopolist is to have maximum profits.

CHARACTERISTICS OF MONOPOLY:

THE MAIN FEATURES OF MONOPOLY ARE AS FOLLOWS:

Under monopoly, there is one producer or seller of a particular product and there is no difference Between a firm and an industry. Under monopoly a firm itself is an industry.

A monopoly may be individual proprietorship or partnership or Joint Stock Company or a co-operative society or a government company.

A monopolist has full control on the supply of a product. Hence, the elasticity of demand for a monopolist's product is zero.

There is no close substitute of a monopolist's product in the market .Hence, under monopoly ,the cross elasticity of demand for a monopoly product with some other good is very lo

CAUSES OF MONOPOLY MARKET

A monopoly may arise because of some natural causes. Some minerals are available only in certain regions. For example, almost all the nickel in the world is available in Canada. So the International Nickel Corporation of Canada has the monopoly of nickel. Similarly, South Africa has the monopoly of diamonds.

Some crops, which require special conditions of climate and soil are found only in one or two areas. For example, jute is grown in India and Pakistan.

Some products are produced by a secret process in some firms. This is particularly true of most of the chemical industries. Such firms have monopoly of some goods.

Some firms enjoy legal rights such as patent rights, copyright and so on. This leads to legal monopoly.

The manufacture of some goods requires a large amount of capital .All firms cannot enter the field because they cannot afford to invest a large amount of capital. This may give rise to monopoly.

Lastly, the government will have the sole right of producing and selling goods. For example, we have 'public utilities.'They are state monopolies.

PRICING UNDER MONOPOLY

Monopoly refers to a market situation where there is only one seller. He has complete control over the supply of a commodity. He is therefore in a position to

Fix any price .Under monopoly there is no distinction between a firm and an industry. This is because the entire industry consists of a single firm.

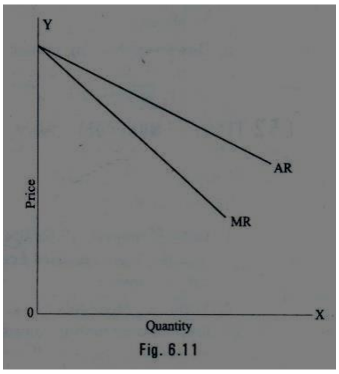


Fig. 6.11

DETERMINATION OF PRICE IN THE SHORT PERIOD:

If, in a short period ,the cost of production o f a commodity is zero, he will go on producing it to the extent or so long the marginal revenue from the sale of that commodity does not fall to zero .As soon as the marginal reserve is zero he will not increase its supply.

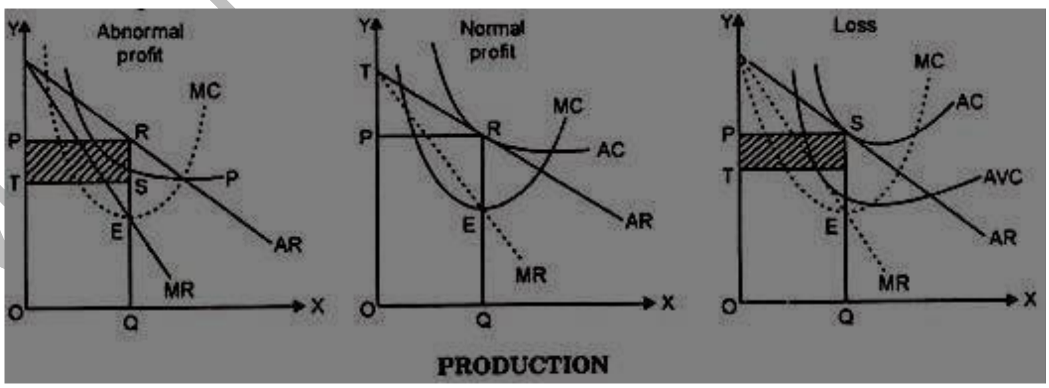
Some economists think that, in a short period, three different situations may arise before the monopolist:

When the monopolist earns abnormal profits,

When he gets only normal profits, and

When he suffers losses.

The explanation and diagrams of these situations are given below:



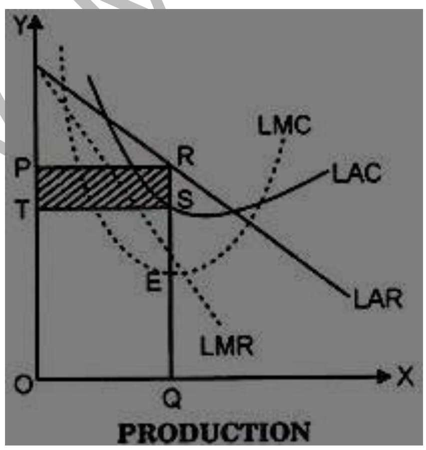
On the point E the firm is in equilibrium when MC = MR. Thereafter MC curve starts to rise .Under the condition, OP is the price and OQ is the ‘total production ’of the commodity so determined. In order to calculate profits or losses, we will have to measure the difference between AR and AC. If AR > AC, the difference between the two is profit per unit and by multiply it with total number of units produced we can get total profit.

In the first figure RQ= OP is the price ,TO is the cost of production per unit. Thus, RS =PT is unit for profit. On the OQ quantity of production, total profit is PTSR shaded area which is abnormal profit. In the second figure RQ = OP is the determined price and RQ is the average cost .Under this condition, there will be only normal profit.

In the figure three also price per unit is RQ=OP but cost per unit is SQ. Thus, SR (TP) is loss per unit. As a result TPRS shaded area will be the total loss. But this loss is only short period phenomenon. In the long period, this loss will disappear, under that condition and situation, only profit will be earned.

DETERMINATION OF PRICE IN THE LONG PERIOD:

In the long period the monopolist introduces changes in his equipment's and techniques of production. During this period in order to gain excess profit, he will change efficiency and capacity of his resources according to his need. But the determination of the quantity of production follows, the same line as under short period.
This is clear from the following figure:



In this figure LMC and LMR intersect each other at the point E and after that LMC goes on rising. Thus OQ production is determined and OP is the price. But average cost is SQ. So profit per unit is RS and at OQ output the total profit is PTSR.

Under Price Competition AR=MR, where-as under Monopoly MR<AR.

Under perfect competition price is determined by the interaction of total demand and supply. This price is acceptable to all the firms in the industry. No firm can change this price. So, average revenue and marginal revenue, at every level of production, will be constant and equal .Their curves are parallel to X-axis.

Under Monopoly, to sell every additional unit of the commodity price will have to be lower. In this way, with the sale of every additional unit, average and marginal income goes on falling. But the decrease in average revenue is relatively less sharp than the decrease in marginal revenue, It is because marginal revenue is limited to one unit, whereas in case of average revenue, the decrease price is divided by the number of units. Therefore, the fall in average revenue has relatively less slope. That is the reason why marginal revenue is less than average revenue.

DUOPOLY:

Duopoly is a special case of the theory of oligopoly in which there are only two sellers. Both the sellers are completely independent and no agreement exists between them. Even though they are independent, a change in the price and output of one will affect the other ,and may set a chain of reactions .A seller may, however Assume that his rival is unaffected by what he does, in that case he takes only his own direct influence on the price.

CHARACTERISTICS OF DUOPOLY MARKET

The duopoly market have some characteristics which is a like characteristics of oligopoly market. So the characteristics of duopoly market are as follows:-

Presence of monopoly element- products are differentiated and each product enjoy some amount of customer loyalty as a result firm enjoy some monopoly power.

Price rigidity exists in this type of market structure. It means price of product in this market does not change immediately with change in demand and supply in market.

In this type of market structure either advertising is done to increase its sales volume or by improving quality of its product.

There is interdependency among firms as no firm can ignore the action and reaction of its rival firm.

The demand curve is indeterminate, any step taken by rival firm will effect firms product demand.

There exists a conflict attitude among a firm as they have two types of attitude on one hand they want to have joint venture to increase their profit and on the other hand they want to earn profit individually. So these both attitude have conflict among themselves.

MONOPOLISTIC COMPETITION

Monopolistic Competition refers to a situation where there are many sellers of a differentiated product.

There is competition which is not perfect ,between many firms making very similar products which are close but not perfect substitutes.

Monopolistic market exhibits characteristic of both perfect competition and monopoly.

FEATURES OF MONOPOLISTIC COMPETITION

A LARGE NUMBER OF SELLERS: In a market with monopolistic competition ,there are a large number of sellers who have a small share of the market.

PRODUCT DIFFERENTIATION: In a monopolistic competition, all brands try to create product differentiation to add an element of monopoly over the competing products. This ensures that the product offered by the brand does not have a perfect substitute. Therefore, the manufacturer can raise the price of the product without having to worry about losing all its customers to other brands. However, in such a market, while all brands are not perfect substitutes, they are close substitutes for each other. Hence, the seller might lose at least some customers to his competitors.

FREEDOM OF ENTRY OR EXIT: Like imperfect competition, firms can enter and exit the market freely.

NON-PRICE COMPETITION: In a monopolistic competition, sellers compete on factors other than price. These factors include aggressive advertising, product development .better distribution, after sales services etc. Sellers don't cut the price of their products but incur high costs for the promotion of their goods. If the firms indulge in price-wars, which is the possibility under a perfect competition, some firms might get thrown out of the market.

SELLING COST: A firm tries to promote its product by different types of expenditures. Advertisement is the most important constituent of the selling cost which affects demand as well as cost of the product. The main purpose of the monopolist is to earn maximum profits; therefore, he adjusts this type of expenditure accordingly.
LACK OF PERFECT KNOWLEDGE: The buyers and sellers do not have perfect knowledge of the market. There are innumerable products each being a close substitute of the other. The buyers do not know about all these products, their qualities and prices.

Therefore, so many buyers purchase a product out of a few varieties which are offered for sale near the home. Sometimes a buyer knows about a particular commodity where it is available at low price. But is unable to go there due to lack of time or he is too lethargic to go or he is unable to find proper conveyance. Likewise, the seller does not know the exact preference of buyers and is, therefore, unable to get advantage out of the situation.

MORE ELASTIC DEMAND AND LESS MOBILITY: Under monopolistic competition, demand

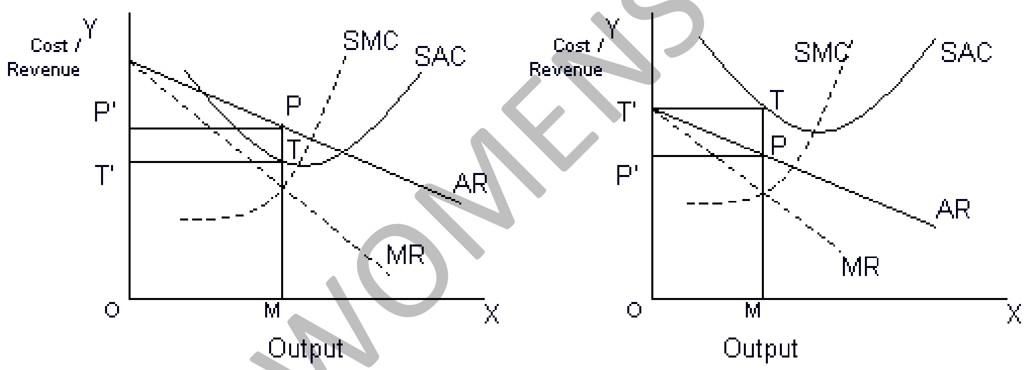
Under monopolistic competition both the factors of production as well as goods and services are not perfectly mobile curve is more elastic. In order to sell more, the firms must reduce its price.

PRICE DETERMINATION UNDER MONOPOLISTIC COMPETITION:

Under monopolistic competition, the firm will be in equilibrium position when marginal revenue is equal to marginal cost. So long the marginal revenue is greater than marginal cost, the seller will find it profitable to expand his output, and if the MR is less than MC, it is obvious he will reduce his output where the MR is equal to MC. In short run, therefore, the firm will be in equilibrium when it is maximising profits, i.e., when MR = MC.

SHORT RUN EQUILIBRIUM:

Short run equilibrium is illustrated in the following diagram:



(a) Short Run Equilibrium with Profit (b) Short Run Equilibrium with Loss

DIAGRAM: MONOPOLISTIC COMPETITION SHORT RUN EQUILIBRIUM

In the above diagram, the short run average cost is MT and short run average revenue is MP. Since the AR curve is above the AC curve, therefore, the profit is shown as PT. PT is the supernormal profit per unit of output. Total supernormal profit will be measured by multiplying the super normal profit other total output ,i.e. PT× OM or PTT'P' as shown in figure

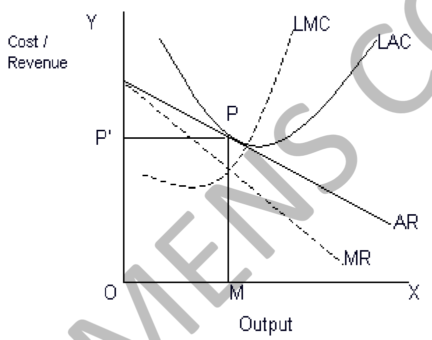
(a). The firm may also incur losses in the short run if it is facing AR curve below the AC curve. In figure

MP is less than MT and TP is the loss per unit of output. Total loss will be measured by multiplying loss per unit of output to the total output, i.e., TP×OM or TPP'T'.

LONG RUN EQUILIBRIUM:

Under monopolistic competition, the supernormal profit in the long run is disappear as new firms are entered into the industry .As the new firms are entered into the industry, the demand curve or AR curve will shift to the left, and therefore, the super normal profit will be competed away and the firms will be earning normal profits. If in the short run firms are suffering from losses, then in the long run some firms will leave the industry so that remaining firms are earning normal profits.

The AR curve in the long run will be more elastic, since a large number of substitutes will be available in the long run. Therefore, in the long run, equilibrium is established when firms are earning only normal profits. Now profits are normal only when AR =AC. It is further illustrated in the following diagram:



Long Run Equilibrium in Monopolistic Competition

OLIGOPOLY

Definition: The Oligopoly Market characterized by few sellers, selling the homogeneous or differentiated products. In other words, the Oligopoly market structure lies between the pure monopoly and monopolistic competition, where few sellers dominate the market and have control over the price of the product.

UNDER THE OLIGOPOLY MARKET, A FIRM EITHER PRODUCES:

HOMOGENEOUS PRODUCT: The firms producing the homogeneous products are called as Pure or Perfect Oligopoly. It is found in the producers of industrial products such as aluminium, copper, steel, zinc, iron, etc.

HETEROGENEOUS PRODUCT: The firms producing the heterogeneous products are called as Imperfect or Differentiated Oligopoly. Such type of Oligopoly Found in the producers of consumer goods such as automobiles, soaps, detergents, television, refrigerators, etc.

FEATURES OF OLIGOPOLY MARKET

FEW SELLERS: Under the Oligopoly market, the sellers are few, and the customers are many. Few firms dominating the market enjoys a considerable control over the price of the product.

INTERDEPENDENCE: it is one of the most important features of an Oligopoly market, where in, the seller has to be cautious with respect to any action taken by the competing firms. Since there are few sellers in the market, if any firm makes the change in the price or promotional scheme, all other firms in the industry have to comply with it, to remain in the competition.

Thus, every firm remains alert to the actions of others and plan their counterattack beforehand, to escape the turmoil. Hence, there is a complete inter dependence among the sellers with respect to their price-output policies.

ADVERTISING: Under Oligopoly market, every firm advertises their products on a frequent basis, with the intention to reach more and more customers and increase their customer base. This is due to the advertising that makes the competition intense. If any firm does a lot of advertisement while the other remained silent, then he will observe that his customers are going to that firm who is continuously promoting its product. Thus, in order to be in the race, each firm spends lots of money on advertisement activities.

COMPETITION: It is genuine that with a few players in the market, there will be an intense competition among the sellers. Any move taken by the firm will have a considerable impact on its rivals. Thus, every seller keeps an eye over its rival and be ready with the counter attack.

ENTRY AND EXIT BARRIERS: The firms can easily exit the industry whenever it wants, but has to face certain barriers to entering into it. These barriers could be Government license, Patent, large firm's economies of scale, high capital requirement ,complex technology, etc. .Also, sometimes the government regulations favour the existing large firms, there by acting as a barrier for the new entrants.

LACK OF UNIFORMITY: There is a lack of uniformity among the firms in terms of their size, some are big, and some are small.

GROUP BEHAVIOUR: In oligopoly, the most relevant aspect is the behaviour of the group. There can be two firms in the group, or three or five or even fifteen,

But not a few hundred. Whatever the number ,it is quite small so that each firm knows that its actions will have some effect on other firms in the group .In contrast, under perfect competition there are a large number of firms each attempting to maximise its profits.

EXISTENCE OF PRICE RIGIDITY: In oligopoly situation, each firm has to stick to its price. If any firm tries to reduce its price, the rival firms will retaliate by a higher reduction in their prices. This will lead to a situation of price war which benefits .On the other hand, if any firm increases its price with a view to increase its profits; the other rival firms will not follow the same. Hence, no firm would like to reduce the price or to increase the price. The price rigidity will take place.

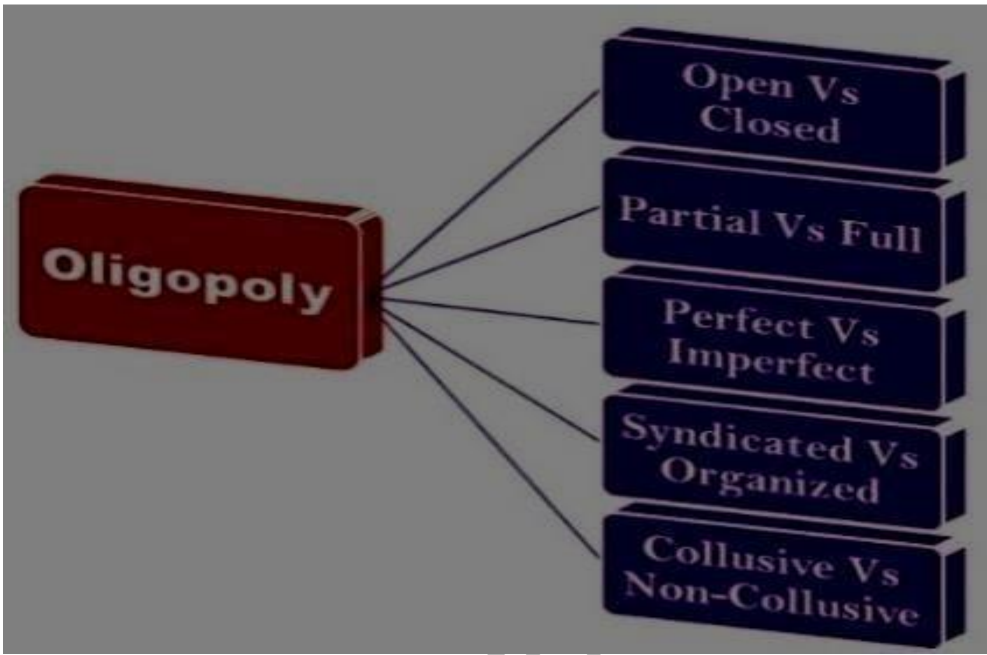
NO UNIQUE PATTERN OF PRICING BEHAVIOUR: The rivalry arising from interdependence among the oligopolists leads to two conflicting motives. Each wants to remain independent and to get the maximum possible profit. Towards this end, they act and react on the price-output movements of one another which are a continuous element of uncertainty.

INDETERMINATENESS OF DEMAND CURVE: In market structures other than oligopolistic, demand curve faced by a firm is determinate .The interdependence of the oligopolists , however, makes it impossible to draw a demand curve for such sellers except for the situations where the form of interdependence is well defined. In real business operations, the demand curve remains indeterminate. Under oligopoly a firm can expect at least three different reactions of the other sellers when it lowers its prices.

Thus, every firm must keep a close eye on its counterpart and plan the promotional activities accordingly.

TYPES OF OLIGOPOLY MARKET

Definition: The Oligopoly is a market structure wherein few sellers dominate the market and sell the homogeneous or heterogeneous products.



OPEN VS. CLOSED OLIGOPOLY: This classification is made on the basis of freedom to enter into the new industry. An open Oligopoly is the market situation wherein firm can enter into the industry any time it wants, whereas, in the case of a closed Oligopoly, there are certain restrictions that act as a barrier for a new firm to enter into the industry.

PARTIAL VS FULL OLIGOPOLY: This classification is done on the basis of price leadership. The partial Oligopoly refers to the market situation, wherein one large firm dominates the market and is looked upon as a price leader. Whereas in full Oligopoly, the price leadership is conspicuous by its absence.

PERFECT (PURE) VS IMPERFECT (DIFFERENTIAL) OLIGOPOLY: This classification is made on the basis of product differentiation. The Oligopoly is perfect or pure when the firms deal in the homogeneous products. Whereas the Oligopoly is said to be imperfect, when the firms deal in heterogeneous products, i.e. products that are close but are not perfect substitutes.

SYNDICATED VS. ORGANIZED OLIGOPOLY: This classification is done on the basis of a degree of coordination found among the firms. When the firms come together and sell their products with the common interest is called as a Syndicate Oligopoly. Whereas ,in the case of an Organized Oligopoly ,the firms have a central association for fixing the prices, outputs, and quotas.

COLLUSIVE VS. NON-COLLUSIVE OLIGOPOLY: This classification is made on the basis of agreement or understanding between the firms. In Collusive Oligopoly, instead of competing with each other, the firms come together and with the consensus of all fixes the price and the outputs. Whereas in the case of a non- collusive Oligopoly, there is a lack of understanding among the firms and they compete against each other to achieve their respective targets.

Thus, oligopoly market is a market structure that lies between the monopolistic competition and a pure monopoly.

CAUSES OF OLIGOPOLY

- Economies of scale
- Mergers and acquisitions
- Entrepreneurial genius
- Patent rights
- Exclusive control of factor input Price Determination under Oligopoly:

THE SWEETIE MODEL OF KINKED DEMAND CURVE (RIGID PRICES):

In his article published in 1939, Prof. Sweetie presented the kinked demand curve analysis to explain price rigidities often observed in oligopolistic markets. assumes that if the oligopolistic firm lowers its price, its rivals will react by matching that price cut m order to avoid losing their customers. Thus the firm lowering the price will not be able to increase its demand much. This portion of its demand curve is relatively inelastic.

On the other hand, if the oligopolistic firm increases its price, its rivals will not follow it and change their prices. Thus the quantity demanded of this firm will fall considerably .This portion of the demand curve is relatively elastic .In these two situations, the demand curve of the oligopolistic firm has a kink at the prevailing market price which explains price rigidity.

ASSUMPTIONS:

THE KINKED DEMAND CURVE HYPOTHESIS OF PRICE RIGIDITY IS BASED ON THE FOLLOWING ASSUMPTIONS:

- There are few firms in the oligopolistic industry.
- The product produced by one firm is a close substitute for the other firms.
- The product is of the same quality. There is no product differentiation.

- There are no advertising expenditures.
- There is an established or prevailing market price for the product at which all the sellers are satisfied.
- Each seller's attitude depends on the attitude of his rivals.

The marginal cost curve passes through the dotted portion of the marginal revenue curves of that changes in marginal cost do not affect output and price.

EXPLANATION ABOUT KINKED DEMAND CURVE:

In an oligopolistic market, firms cannot have a fixed demand curve since it keeps changing as competitors change the prices/quantity of output.

Since an oligopolistic is not aware of the demand curve, economists have designed various price-output models based on the behaviour pattern of other firms in the industry.

In many oligopolistic markets, it has been observed that prices tend to remain inflexible for a very long time. hypothesis, the demand curve facing an oligopolistic has a kink at the level of Even in the face of declining costs, they tend to change infrequently in many oligopolistic markets, it has been observed that prices tend to remain inflexible for a very long time .Even in the face of declining costs, they tend to change infrequently.

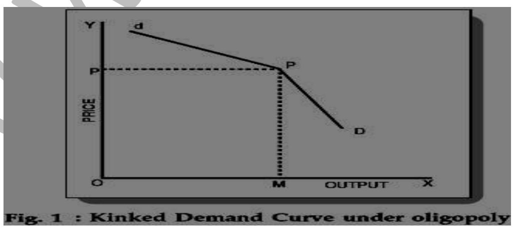


Fig. 1 : Kinked Demand Curve under oligopoly

FROM THE FIGURE, WE KNOW THAT

The prevailing price level=P

The firm produces and sells output=OM

Also, the upper segment (DP) of the demand curve (DD) is elastic.

The lower segment (PD) of the demand curve (DD) is relatively inelastic.

This difference in elasticity's is due to an assumption of the kinked demand curve hypothesis.

ASSUMPTION:

Each firm in an oligopoly believes the following two things:

If he lowers the price below the prevailing level, then the competitors will follow him.

If he increases the price above the prevailing level, then the competitors will NOT follow him.

There is a logical reasoning behind this assumption. When an oligopolistic lowers the price of his product, the competitors feel that if they don't follow the price cut, then their customers will leave them and buy from the firm who is offering a lower price. Therefore, they lower their prices too in order to maintain their customers. Hence, the lower portion of the curve is inelastic .It implies that if a oligopolistic lowers the price, he can obtain very little sales.

On the other hand, when a firm increases the price of its product, it experiences a substantial Deduction in sales. The reason is simple – consumers will buy the same/similar product from its competitors. This increases the competitors' sales and they will have no motivation to match the price rise. Therefore, the firm that raises the price suffers a loss and hence refrain from increasing the price.

This behaviours of oligopolists can help us understand the elasticity of the upper portion of the demand curve. The figure shows that if a firm raises the price of a product, then it experiences a large fall in sales. Hence, no firm in an oligopolistic market will try to increase the price and a kink is formed at the prevailing price. This is how the kinked demand curve hypothesis explains rigid or sticky prices.