

Unit III

Production, Cost, Market Structures & Pricing

PRODUCTION ANALYSIS

Production is another important economic activity. It directly or indirectly satisfies the wants and needs of the people. Satisfaction of human wants is the objective of production. Production is the conversion of input into output. The factors of production and all other things which the producer buys to carry out production are called inputs. The final goods and services produced are known as output. In economics, the term production is not the same as in common language where it is usually taken to mean 'creation' of something. In economics, the term production carries a wider connotation. It stands for creation of 'value', which can be of two varieties, namely 'use value' and 'exchange value'. Thus, production is the activity which creates or adds utility and value. According to Edwood Buffa, "Production is a process by which goods and services are created".

Factors of Production:

The resources needed to produce a given product are called factors of production. Production of goods and services needs various inputs which are known as 'Factors of Production', 'Agents of Production', 'Productive Resources' or sometimes even 'Productive Services'. According to Marshall, the four major factors of production are:

1. Land
2. Labor
3. Capital
4. Entrepreneurship

The level of production depends upon both the quantity of inputs and the efficiency with which they are employed in the process of production. It is also noteworthy that economic growth of a country, in a way, represents its productive capacity which, in turn, depends upon the technology and amounts of productive resources.

1. Land: Land is not created by mankind but it is a gift of nature available to us free of cost. So, it is called as natural factor of production. It is also called as original or primary factor of production. Normally, land means surface of earth. But in economics, land has a wider meaning.

Land includes earth's surface and resources above and below the surface of the earth. It includes following natural resources:-

- On the surface (e.g. soil, agricultural land, etc.)
- Below the surface (e.g. mineral resources, rocks, ground water, etc.)
- Above the surface (e.g. climate, rain, etc.)

Land is the sum total of those productive resources which are provided 'free of cost' by nature to us that is to say those resources on which no human effort has been expended to make them actually usable in a productive process. Land is a free gift of nature to mankind. It is not a man-made factor but is a natural factor. Land is primary factor of production.

2. Labor: The term labor is used to mean several things and can be a source of great deal of vagueness and imprecise statements. The term labor refers to only human effort (or activity) which can be physical, mental or a mixture of the two. It does not include the work performed by animals or machines or nature. Labor lately is known as human resource. All companies need labor in order to carry out production. Everyone from the manual workers, to the owner of the company falls under the classification of human resources. Without this

factor, there would be no production because nobody would be working. Labor cannot be separated from laborers. Worker sells their service and doesn't sell themselves. Labor cannot be stored. Once the labor is lost, it cannot be made up. Unemployed workers cannot store their labor for future employment. Labor is an active factor of production unlike land.

3. Capital: Capital is another important factor which plays a huge role in the production. Capital includes things like tools, machines, and other things that a business uses in order to produce their goods or services. At some level, all companies rely on their capital in order to run successfully. Without these things, the company would be unable to carry out production. The term capital may mean different in different disciplines; in economics, capital is that part of wealth which is used for production. It is one of the factors of production/ input.

The word capital in economics may mean either of the three;

- Assets
- money/ wealth
- income

4. Entrepreneurship: Factors of production viz. land, labor, and capital are scattered at different places. These cannot produce economic goods and services by themselves. They have to be brought together and, in a coordinated way, made to pass through a productive process to create output. According to Kaldor, entrepreneurship consists of three major functions, viz, coordination, management, and supervision. All these factors have to be assembled together. This work is done by enterprise through entrepreneur. This is the function of an entrepreneur; to bring the required factors together and making them work harmoniously.

This final factor of production of entrepreneurship involves the activity right from start of the business to assembling of other factors in order to carry out production smoothly. It is not possible for an entrepreneur to start production process without other factors of production viz. land, labor, capital. Entrepreneurship is an independent factor of production.

Production Function

The functional relationship between input and output is known as production function. The production function states the maximum quantity of output which can be produced from any selected combination of inputs. In other words, it states the minimum quantities of input that are necessary to produce a given quantity of output.

The production function can be expressed in form of an equation in which the output is the dependent variable and inputs are the independent variables. The equation is expressed as follows:

$$QX = f(L, K, T, \dots, n)$$

Where, QX = Output

L = Labour

K = Capital

T = Level of Technology

n = Other Inputs Employed in Production

The production function is based on the following set of assumptions:

- The level of technology remains constant.
- The firm uses its inputs at maximum level of efficiency.
- It relates to a particular unit of time.

- A change in any of the variable factors produces a corresponding change in the level of output.
- The inputs are divisible into most viable units.
- There are two types of production function short run production function or Production function with one variable and long run production function or Production function with two variable inputs

PRODUCTION FUNCTIONS WITH ONE VARIABLE or LAW OF DIMINISHING RETURNS OR LAW OF VARIABLE PROPORTIONS:

The law of variable proportions is the modern approach to the 'Law of Diminishing Returns (or The Laws of Returns)'. It is now usually called the Law of Variable Proportions. It can also be called the Law of Diminishing Marginal Product or Diminishing Marginal Returns or simply as Diminishing Returns. The law of variable proportions shows the production function with one input factor variable while keeping the other input factors constant.

The law of variable proportions states, "as the proportion of variable factor is increased, the total production at first increases more than proportionately, then proportionately and finally less than proportionately". The classical economists called it the Law of Diminishing Returns. They derived it by applying more and more labor to a fixed acreage of land, and thought of it as associated particularly with agriculture. But, it is a general principle that can be applied to any production operation.

According to K.E. Boulding, "As we increase the quantity of any one input which is combined with a fixed quantity of the other inputs, the marginal physical productivity of the variable input must eventually decline".

According to P. A. Samuelson, "An increase in some inputs relative to other fixed inputs will, in a given state of technology, cause output to increase but after a point the extra output resulting from the same additions of extra inputs will become less and less"

Marshall defined the law by saying, "An increase in the capital and labor applied in the cultivation of land causes in general a less proportionate increase in the amount of product raised until it happens to coincide with an improvement in the art of agriculture."

It should be noted that Marshall recognizes that this law is applicable only in the short run when the technology can be assumed to be given and inputs can be combined only within a given range of combinations. This law states the effect of variations in factor proportion on output. When one factor varies and the others remain fixed; the proportion between the fixed factor and the variable factor will vary. That is why the law is called the law of variable proportions.

Assumptions of the Law The law of variable proportion is valid with the following assumptions:

- The technology remains constant. If there is an improvement in the technology, due to inventions, the average and marginal product will increase instead of decreasing.
- There are two factors of production. One factor is variable and other factor is kept constant.
- All the units of the variable factor are identical in all respects. They are of the same size and quality.
- A particular product can be produced under varying proportions of the input combinations.
- The law operates in the short run.

In short-period, when the production of an output is sought to be increased; by increasing an additional unit of variable factor to a given quantity of fixed factors, the law of variable proportions comes into operation. The law of variable proportions provides the result to varying the proportions of the fixed and variable factors of production. When the quantity of one factor is increased while all other factors remain constant, then the proportion between the fixed and variable factors is altered. Earlier, economists distinguished this law into three separate laws of returns; namely diminishing, increasing and constant returns. Modern Economist, however, stated that these are three different aspects of the same law, viz. 'Law of Variable Proportions'. There are three stages to this law in the following sequence:

- Stage of Increasing Returns
- Stage of Diminishing Returns
- Stage of Negative Returns

Average Product or Average Physical Product (APP): is the total physical product (TPP) divided by the quantity of input.

$$APPL = TPP/L$$

$$APPK = TPP/K$$

Marginal Product or Marginal Physical Product (MPP): It is the increase in total output that results from a one unit increase in the input, keeping all other inputs constant.

$$MPPL = TPP/L \text{ (or) } MPPL = TPP_n - TPP_{n-1}$$

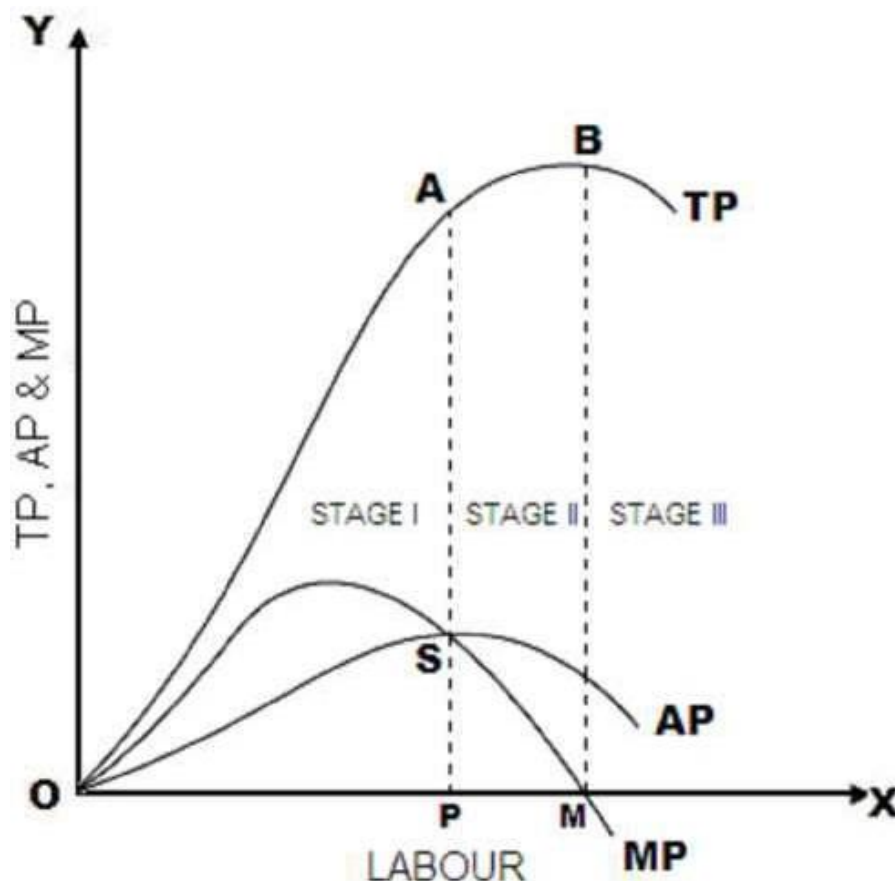
All the three stages taken together describe the Law of Variable Proportions.

Stage I: Total product first increases at an increasing rate and then at a decreasing rate and this continues till the end of this stage. Average product is continuously increasing. MP first increases, becomes maximum and then starts falling. The stage I ends where average product reaches its highest point, so here, the efficiency of variable factor (labour) is maximum. There are two important reasons for increasing returns:

- indivisibility
- specialization

Stage II: Total product continues to increase at a diminishing rate until it reaches its maximum point at the end of this stage. Both AP and MP diminish, but are positive. At the end of the second stage, MP becomes zero. TP is maximum when MP is zero. AP shows a steady decline throughout this stage. As both AP and MP decline, this stage is known as stage of diminishing returns. The main cause of the application of the law of diminishing returns is the scarcity of one or the other factor of production. In other words, the elasticity of substitution between the factors is not infinite.

Stage III: In this stage, TP starts to decline. AP shows a steady decline, but never becomes zero. MP becomes negative. The phenomenon of negative returns emerges as a result of application of excessive units of variable factor in relation to fixed factor, so they get in each other's way, with the result that TP starts diminishing.



Law of Returns to Scale or Production function with two input variables:

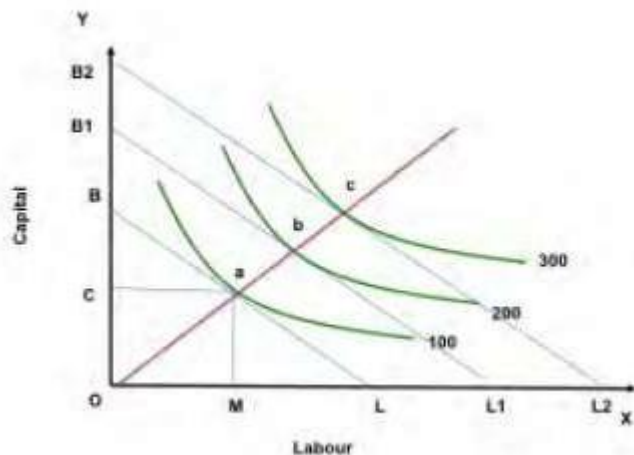
Law of Returns to Scale is a long run concept. In the long run, all factors of production become variable as the firm is able to alter its stock of inputs in long run which is not the case in short run. When all factors are changed in some proportion, the behavior of output is analyzed with the help of laws of returns to scale. Thus, this law takes into consideration not the varying units of inputs but changing scale of production. The scale of production of the firm is determined by those input factors which cannot be changed in the short period. If the firm increases the units of both factors labor and capital, its scale of production increases. To understand a production function with two variable inputs, it is necessary know the concept iso-quant or iso-product curve

ISO-Quant's: To understand the production function with two variable inputs, iso-quant curve is used. These curves show the various combinations of two variable inputs resulting in the same level of output. The shape of an Iso-quant reflects the ease with which a producer can substitute among inputs while maintaining the same level of output.

Iso-cost: different combination of inputs that can be purchased at a given expenditure level. Iso cost line shows various combinations of labour and capital that the firm can buy for a given factor prices.

Producer's equilibrium

The points of tangency between iso quant and iso cost curves depict optimal input combination at different activity levels.



Expansion path: Optimal input combinations as the scale of production expand. From the graph it is clear that the optimum combination is selected based on the tangency point of iso cost (budget line) and iso- quant i.e., a, b respectively. The point 'a' indicates that to produce 100 units of motor the best combination of capital and labour are OC and OM which is within the budget. Over a period of time a firm will face various optimum levels if we connect all points we derive expansion path of a firm.

Returns to Scale

A return to scale is the rate at which the output increases with the increase in all inputs proportionately. There are three cases of returns to scale:

- Increasing Returns to Scale
- Constant Returns to Scale
- Diminishing Returns to Scale

Increasing Returns to Scale: When inputs are increased in a given proportion and output increases in a greater proportion, the returns to scale are said to be increasing. In other words, proportionate increase in all factors of production results in a more than proportionate increase in output is a case of increasing returns to scale. Thus, if all inputs are doubled then total output is more than doubled.

For example, if the inputs are increased by 40% and output increases by 50%, return to scale are increasing. It is the first stage of production. If the industry is enjoying increasing returns, then its marginal product increases. As the output expands, marginal costs come down.

Increasing Returns: % change in output > % change in inputs

Constant Return to Scale: When inputs are increased in a given proportion and output increases in the same proportion, the returns to scale are said to be constant. Thus, if all inputs are doubled then total output is also doubled. For example, if inputs are increased by 40% and output also increases by 40%, the returns to scale are said to be constant.

Constant Returns: % change in output = % change in inputs

Decreasing Returns to Sale: If the firm continues to expand beyond the stage of constant returns, the stage of diminishing returns to scale will start to operate. If a proportionate increase in all inputs results in less than proportionate increase in output, the returns to scale are said to be decreasing. Thus, if all inputs are doubled then total output is less than doubled.

For example, if inputs are increased by 40%, but output increases by only 30%, it is a case of decreasing returns to scale. Decreasing return to scale implies increasing costs.

Decreasing Returns: % change in output < % change in inputs

Different Types of Production Functions:

Production function is the mathematical representation of relationship between physical inputs and physical outputs of an organization. There are different types of production functions that can be classified according to the degree of substitution of one input by the other. The different types of production function

1. Cobb-Douglas Production Function: Cobb-Douglas production function refers to the production function in which one input can be substituted by other but to a limited extent. For example, capital and labor can be used as a substitute of each other, but to a limited extent only.

$$Q = AK^aL^b$$

Where, A = positive constant, a and b = positive fractions, b = 1 – a Therefore, Cobb- Douglas production function can also be expressed as follows: $Q = ak^aL^{1-a}$

2. Leontief Production Function: Leontief production function uses fixed proportion of inputs having no substitutability between them. It is regarded as the limiting case for constant elasticity of substitution. The production function can be expressed as follows:

$$q = \min (z_1/a, Z_2/b)$$

Where, q = quantity of output produced, Z_1 = utilized quantity of input 1, Z_2 = utilized quantity of input 2, a and b = constants. For example, tyres and steering wheels are used for producing cars. In such case, the production function can be as follows: $Q = \min (z_1/a, Z_2/b)$, $Q = \min$ (number of tyres used, number of steering used).

3. CES Production Function: CES stands for constant elasticity substitution. CES production function shows a constant change produced in the output due to change in input of production. It can be represented as follows:

$$Q = A [aK^\beta + (1-a) L^{-\beta}]^{-1/\beta}$$

CES has the homogeneity degree of 1 that implies that output would be increased with the increase in inputs. For example, labor and capital has increased by constant factor m.

COST ANALYSIS

A production function tells us how much output a firm can produce with its existing plant and equipment. The level of output depends on prices and costs. The most desirable rate of output is the one that maximizes total profit that is the difference between total revenue and total cost. Entrepreneurs pay for the input factors- Wages for labour, price for raw material, rent for building hired, interest for borrowed money. All these costs are included in the cost of production. The economist's concept of cost of production is different from accounting. This chapter helps us to understand the basic cost concepts and the cost output relationship in the short and long runs. Having looked at input factors in the previous chapter it is now possible to see how the law of diminishing returns affect short run costs.

Types Of Costs

There are various classifications of costs based on the nature and the purpose of calculation. But in economics and for accounting purpose the following are the important cost concepts. Actual cost/ Outlay cost/ absolute cost / Accounting Costs: The cost or expenditure which a firm incurs for producing or acquiring a good or service. (Eg. Raw material cost)

1. **Explicit cost:** Cost actually paid by the firm. If the factors of production are hired or rented then it is an explicit cost. Implicit cost: If the factors of production are owned by a firm then its cost is implicit cost.
2. **Opportunity cost:** The revenue which could have been earned by employing that good or service in some other alternative uses. (Eg. A land owned by the firm does not pay rent. Thus a rent is an income forgone by not letting it out)
3. **Sunk cost:** Are retrospective (past) costs that have already been incurred and cannot be recovered.
4. **Historical cost:** The price paid for a plant originally at the time of purchase.
5. **Replacement cost:** The price that would have to be paid currently for acquiring the same plant.
6. **Incremental cost:** Is the addition to costs resulting from a change in the nature of level of business activity. Change in cost caused by a given managerial decision.
7. **Book cost:** Costs which do not involve any cash payments but a provision is made in the books of accounts in order to include them in the profit and loss account to take tax advantages.
8. **Social cost:** Total cost incurred by the society on account of production of a good or service. Transaction cost: The cost associated with the exchange of goods and services.
9. **Controllable cost:** Costs which can be controllable by the executives are called as controllable cost.
10. **Shut down cost:** Cost incurred if the firm temporarily stops its operation. These can be saved by continuing business.
11. **Economic costs are related to future:** They play a vital role in business decisions as the costs considered in decision - making are usually future costs. They are similar in nature to that of incremental, imputed explicit and opportunity costs.

In the process of its decision-making, in order to be able to decide the price of the product at which it would offer the same in market; a firm needs to acquaint itself with the costs of producing the product. The cost of supplying the product is determined by the productivity and the prices of the inputs used. The cost function of a firm shows a relationship between output produced and the associated cost of producing it. Hence, costs are nothing but input prices. There are four major inputs as discussed; land, labor, capital and entrepreneurship. The costs attached with each are; rent, wages, interest, and profits respectively. Like production, costs of a firm may also be analyzed in the context of time period as follows:

1. Short Run Costs
2. Long Run Costs

Short Run Cost Structure

There are two categories of costs in short run: Fixed cost and Variable cost.

Fixed cost: Some inputs are used over a period of time for producing more than one batch of goods. The costs incurred in these are called fixed cost. For example amount spent on purchase of equipment, machinery, land and building.

Variable cost: When output has increased the firm spends more on these items. For example the money spent on labour wages, raw material and electricity usage. Variable costs vary according to the output. In the long run all costs become variable.

Total Cost Curves: Graphically, if quantity of output is measured along X-axis and costs are measured along Y axis, then the Total Fixed Cost Curve (TFC) runs parallel to X-axis. In contrast, total variable cost and total output are positively related. They move together. With zero output, the variable costs of the firm are also zero. The total variable cost (TVC) curve, therefore, starts from the point of origin. If we add the two curves vertically, we get a corresponding curve which represents total cost (TC). Its starting point on Y-axis coincides with that of TFC curve.

Average Fixed Cost (AFC) Curve: Since total fixed costs do not change with level of output, therefore, average fixed cost (AFC) declines with increase in the level of output and tends to infinity when output reaches zero. For first unit of output, AFC equals TFC. The AFC curve, therefore, is a rectangular hyperbola.

$$AFC = TFC / Q$$

Average Variable Cost (AVC) Curve: As output increases total variable cost also increases. But the rate of increase of TVC would depend on whether the law of eventual diminishing returns operates or not, when it is not operating TVC increases (slowly) less than proportionately to product (Q). As a result, AVC decreases. However, once the law starts to operate, TVC increases (steadily) more than proportionately to product implying increase in AVC. Consequently, the shape of the average cost curve is U-shaped. It first falls then rises.

$$AVC = TVC / Q$$

Average Total Cost, or Average Cost (ATC or AC) Curve: $AC = TC / Q$ Since, $TC = TFC + TVC$

$$AC = (TFC + TVC) / Q$$

$$AC = (TFC/Q) + (TVC/Q)$$

$$(AC = AFC + AVC)$$

As output increases AFC is declining throughout. However, AVC is declining up to a point and later starts to rise. Therefore, AC is declining rapidly when both AFC and AVC are declining; whereas it starts rising as AFC continues to decline and AVC rises. Graphically, it is obtained by vertical addition of the AFC and AVC curves. AC curve lies above AVC curve. At each point, its vertical distance from AVC curve is exactly equal to the distance of AFC curve from X-axis. Therefore, AC curve is U-shaped and with increasing output, its vertical distance from AVC keeps declining.

Marginal Cost (MC) Curve: Marginal cost is addition to total cost on account of the production of an additional unit. It is ratio of change in total cost to change in total output. In short run, $TC = TFC + TVC$; $MC = d(TC) / dQ$; $MC = d(TFC + TVC) / dQ = (dTFC/dQ) + (dTVC/dQ)$

Since, TFC does not change in short run, MC depends upon only TVC

$$dTFC/dQ = 0$$

$$MC = d(TVC)/dQ$$

For this reason, MC curve is related to only AVC curve. Therefore, MC curve is also a U shaped curve. When AVC is decreasing, MC is less than it and MC curve lies below AVC curve. However, when the rate of fall of AVC slows down, MC curve reaches its lowest value and starts increasing and cuts AVC from below at its lowest point. In other words, when AVC is minimum, MC is equal to it. In the next phase, when AVC curve slopes upwards, MC curve rises faster than the former and lies above it.

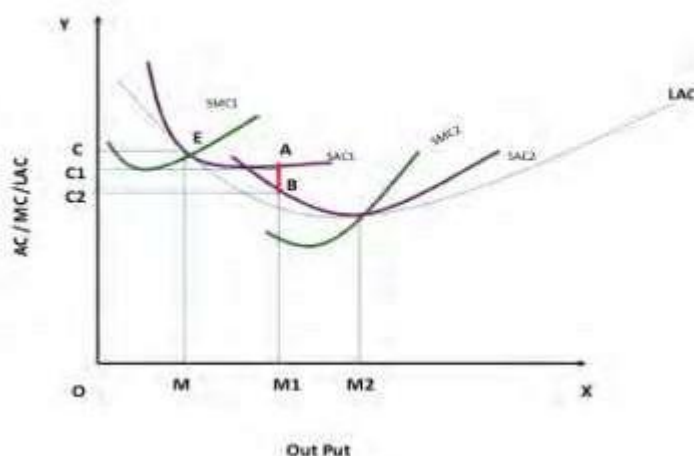
Long Run Cost structures

The term long run is defined as that length of time over which the firm gets an opportunity to vary if need be the quantities of all its inputs. In other words, there are no fixed factors in the long run and therefore there are no fixed costs. All factors are variable and as a result all

costs are variable. If a firm closes down, its total cost (TC) also falls to zero. Similarly, TC increases with an increase in output, but its rate of increase may not be proportionate to the increase in output. In classical reasoning, where production efficiency is determined by proportion of inputs rather than their absolute quantities, total cost of production changes in direct proportion to output. Therefore, TC curve is a straight line with a fixed slope and starts from the origin. Further, in this case, both average cost and marginal cost are throughout equal to each other and remain constant. Their numerical value is equal to the slope of the TC curve.

In the long run costs fall as output increases due to economies of scale, consequently the average cost AC of production falls. Some firms experience diseconomies of scale if the average cost begins to increase. This fall and rise derives a U shaped or boat shaped average cost curve in the long run which is denoted as LAC. The minimum point of the curve is said to be the optimum output in the long run. It is explained graphically in the chart given below.

Graph – Long Run Average Cost Curve



In the long run all factors are variable and the average cost may fall or increase to A, B respectively, but all these costs are above the long run cost average cost. LAC is the lower envelope of all the short run average cost curves because it contains them all. At point 'E' the SAC1 and SMC1 intersect each other, in case the organization increases its output from OM to OM1 they have to spend OC1 amount. In case the organization purchases one more machine (increase in fixed cost) then they will get a new set of cost curves SAC2, and SMC2. But the new average cost curve reduces the cost of production from OC1 to OC2. That means they can save the difference of C1C2 which is nothing but AB. Therefore in the long run due to business expansion a firm can reduce their cost of production. During their business life they will meet many combinations of optimum production and minimum cost in different short periods. In the long run due to law of diminishing returns the long run average cost curve LAC also slopes like boat shape.

MARKET STRUCTURES

After reading this lesson the reader will understand that the economist meaning of market is something different from the common understanding of the market. In economics, the market is the study about the demand for and supply of a particular commodity and its

consequent fixing of prices for instance the market may be a bullion market, stock market, or even food grains market. The market is broadly divided into two categories like perfect market and imperfect market. The perfect market is further divided into pure market (which is a myth) and perfect market. The imperfect market is divided into monopoly market, monopolistic market, and oligopoly market.

The concept of a market is central to the understanding of the determination of price and quantity of output of a commodity under consideration. In ordinary language, the term market refers to a public place in which goods and services are bought and sold. In economics, it has a different meaning. Different economists have tried to define market in different ways. Cournot defines market as, “not any particular market place in which things are bought and sold, but the whole of any region in which buyers and sellers are in such free intercourse with each other that the prices of the same goods tend to equality easily and quickly”.

To Ely, “Market means the general field within which, the force determining the price of particular product operate”. Stonier and Hague explain the term market as “any organisation whereby buyers and sellers of a good are kept in close touch with each other”.

Nature of competition

1. **Number and Nature of Sellers:** The market structures are influenced by the number and nature of sellers in the market. They range from large number of sellers in perfect competition to a single seller in pure monopoly, to two sellers in duopoly, to a few sellers in oligopoly, and to many sellers of differentiated products.
2. **Number and Nature of Buyers:** The market structures are also influenced by the number and nature of buyers in the market. If there is a single buyer in the market, this is buyer's monopoly and is called monopsony market. Such markets exist for local labour employed by one large employer. There may be two buyers who act jointly in the market.
3. **Nature of Product:** It is the nature of product that determines the market structure. If there is product differentiation, products are close substitutes and the market is characterised by monopolistic competition. On the other hand, in case of no product differentiation, the market is characterised by perfect competition. And if a product is completely different from other products, it has no close substitutes and there is pure monopoly in the market.
4. **Entry and Exit Conditions:** The conditions for entry and exit of firms in a market depend upon profitability or loss in a particular market. Profits in a market will attract the entry of new firms and losses lead to the exit of weak firms from the market. In a perfect competition market, there is freedom of entry or exit of firms. But in monopoly and oligopoly markets, there are barriers to entry of new firms. Usually, governments have a monopoly in public utility services like postal, air and road transport, water and power supply services, etc. By granting exclusive franchises, entries of new supplies are barred. In oligopoly markets, there are barriers to entry of firms because of collusion, tacit agreements, cartels, etc. On the other hand, there are no restrictions in entry and exit of firms in monopolistic competition due to product differentiation.

There is no pre-determined number of firms which an industry must have. Their number can vary according to the structure of the market. At one extreme, it may have only one firm in which case it is called a monopoly or a one-firm industry. At the other extreme, an industry

may have such a large number of firms that each of them accounts for an extremely small portion of the total supply of the industry and is not able to influence the price of the product. Between these two extremes, there can be several other possibilities.

On the basis of competition, a market can be classified in the following ways:

1. Perfect Competition
2. Monopoly
3. Duopoly
4. Oligopoly
5. Monopolistic Competition

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. Koutsoyiannis, "Perfect competition is a market structure characterised by a complete absence of rivalry among the individual firms." According to R.G. Lipsey, "Perfect competition is a market structure in which all firms in an industry are price-takers and 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:

- a) **Large Number of Buyers and Sellers:** The first condition is that the number of buyers and sellers must be so large that none of them 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 action alone. In other words, the individual seller is unable to influence the price of the product by increasing or decreasing its supply. Rather, he adjusts his 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".

- b) **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.

- c) **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.

- d) **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. In other words, there is no discrimination on the part of buyers or 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.
- e) **Profit Maximisation Goal:** Every firm has only one goal of maximising its profits.
- f) **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.
- g) **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.
- h) **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.
- i) **Absence of Selling Costs:** Under perfect competition, the costs of advertising, sales-promotion, etc. do not arise because all firms produce a homogeneous product.

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:

- a) 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.

- b) A monopoly may be individual proprietorship or partnership or joint stock company or a cooperative society or a government company.
- c) A monopolist has full control on the supply of a product. Hence, the elasticity of demand for a monopolist's product is zero.
- d) 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 low.
- e) There are restrictions on the entry of other firms in the area of monopoly product.
- f) A monopolist can influence the price of a product. He is a price-maker, not a price-taker.
- g) Pure monopoly is not found in the real world.
- h) Monopolist cannot determine both the price and quantity of a product simultaneously.
- i) Monopolist's demand curve slopes downwards to the right. That is why, a monopolist can increase his sales only by decreasing the price of his product and thereby maximise his profit. The marginal revenue curve of a monopolist is below the average revenue curve and it falls faster than the average revenue curve. This is because a monopolist has to cut down the price of his product to sell an additional unit.

Oligopoly

Oligopoly is a market situation in which there are a few firms selling homogeneous or differentiated products. It is difficult to pinpoint the number of firms in 'competition among the few.' With only a few firms in the market, the action of one firm is likely to affect the others. An oligopoly industry produces either a homogeneous product or heterogeneous products.

The former is called pure or perfect oligopoly and the latter is called imperfect or differentiated oligopoly. Pure oligopoly is found primarily among producers of such industrial products as aluminum, cement, copper, steel, zinc, etc. Imperfect oligopoly is found among producers of such consumer goods as automobiles, cigarettes, soaps and detergents, TVs, rubber tyres, refrigerators, typewriters, etc.

Characteristics of Oligopoly:

In addition to fewness of sellers, most oligopolistic industries have several common characteristics which are explained below:

- a) **Interdependence:** There is recognised interdependence among the sellers in the oligopolistic market. Each oligopolist firm knows that changes in its price, advertising, product characteristics, etc. may lead to counter-moves by rivals. When the sellers are a few, each produces a considerable fraction of the total output of the industry and can have a noticeable effect on market conditions. He can reduce or increase the price for the whole oligopolist market by selling more quantity or less and affect the profits of the other sellers. It implies that each seller is aware of the price-moves of the other sellers and their impact on his profit and of the influence of his price-move on the actions of rivals. Thus there is complete interdependence among the sellers with regard to their price-output policies. Each seller has direct and ascertainable influences upon every other seller in the industry. Thus, every move by one seller leads to counter-moves by the others.
- b) **Advertisement:** The main reason for this mutual interdependence in decision making is that one producer's fortunes are dependent on the policies and fortunes of the other producers in the industry. It is for this reason that oligopolist firms spend much on

advertisement and customer services. As pointed out by Prof. Baumol, “Under oligopoly advertising can become a life-and-death matter.” For example, if all oligopolists continue to spend a lot on advertising their products and one seller does not match up with them he will find his customers gradually going in for his rival’s product. If, on the other hand, one oligopolist advertises his product, others have to follow him to keep up their sales.

- c) **Competition:** This leads to another feature of the oligopolistic market, the presence of competition. Since under oligopoly, there are a few sellers, a move by one seller immediately affects the rivals. So each seller is always on the alert and keeps a close watch over the moves of its rivals in order to have a counter-move. This is true competition.
- d) **Barriers to Entry of Firms:** As there is keen competition in an oligopolistic industry, there are no barriers to entry into or exit from it. However, in the long run, there are some types of barriers to entry which tend to restrain new firms from entering the industry.
- e) **Lack of Uniformity:** Another feature of oligopoly market is the lack of uniformity in the size of firms. Firms differ considerably in size. Some may be small, others very large. Such a situation is asymmetrical. This is very common in the American economy. A symmetrical situation with firms of a uniform size is rare.
- f) **Demand Curve:** It is not easy to trace the demand curve for the product of an oligopolistic. Since under oligopoly the exact behavior pattern of a producer cannot be ascertained with certainty, his demand curve cannot be drawn accurately, and with definiteness. How does an individual seller’s demand curve look like in oligopoly is most uncertain because a seller’s price or output moves lead to unpredictable reactions on price-output policies of his rivals, which may have further repercussions on his price and output.
- g) **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 in a continuous element of uncertainty. On the other hand, again motivated by profit maximisation each seller wishes to cooperate with his rivals to reduce or eliminate the element of uncertainty. All rivals enter into a tacit or formal agreement with regard to price-output changes. It leads to a sort of monopoly within oligopoly. They may even recognise one seller as a leader at whose initiative all the other sellers raise or lower the price. In this case, the individual seller’s demand curve is a part of the industry demand curve, having the elasticity of the latter. Given these conflicting attitudes, it is not possible to predict any unique pattern of pricing behaviour in oligopoly markets.

Monopolistic Competition:

Monopolistic competition refers to a market situation where there are many firms selling a differentiated product. “There is competition which is keen, though not perfect, among many firms making very similar products.” No firm can have any perceptible influence on the price-output policies of the other sellers nor can it be influenced much by their actions. Thus monopolistic competition refers to competition among a large number of sellers producing close but not perfect substitutes for each other.

Characteristics of Oligopoly:

The following are the main features of monopolistic competition:

- a) **Large Number of Sellers:** In monopolistic competition the number of sellers is large. They are “many and small enough” but none controls a major portion of the total output. No seller by changing its price-output policy can have any perceptible effect on the sales of others and in turn be influenced by them. Thus there is no recognised interdependence of the price-output policies of the sellers and each seller pursues an independent course of action.
- b) **Product Differentiation:** One of the most important features of the monopolistic competition is differentiation. Product differentiation implies that products are different in some ways from each other. They are heterogeneous rather than homogeneous so that each firm has an absolute monopoly in the production and sale of a differentiated product.
There is, however, slight difference between one product and other in the same category. Products are close substitutes with a high cross-elasticity and not perfect substitutes. Product “differentiation may be based upon certain characteristics of the products itself, such as exclusive patented features; trade-marks; trade names; peculiarities of package or container, if any; or singularity in quality, design, color, or style. It may also exist with respect to the conditions surrounding its sales.”
- c) **Freedom of Entry and Exit of Firms:** Another feature of monopolistic competition is the freedom of entry and exit of firms. As firms are of small size and are capable of producing close substitutes, they can leave or enter the industry or group in the long run.
- d) **Nature of Demand Curve:** Under monopolistic competition no single firm controls more than a small portion of the total output of a product. No doubt there is an element of differentiation nevertheless the products are close substitutes. As a result, a reduction in its price will increase the sales of the firm but it will have little effect on the price-output conditions of other firms, each will lose only a few of its customers. Likewise, an increase in its price will reduce its demand substantially but each of its rivals will attract only a few of its customers. Therefore, the demand curve (average revenue curve) of a firm under monopolistic competition slopes downward to the right. It is elastic but not perfectly elastic within a relevant range of prices of which he can sell any amount.
- e) **Independent Behaviour:** In monopolistic competition, every firm has independent policy. Since the number of sellers is large, none controls a major portion of the total output. No seller by changing its price-output policy can have any perceptible effect on the sales of others and in turn be influenced by them.
- f) **Product Groups:** There is no any ‘industry’ under monopolistic competition but a ‘group’ of firms producing similar products. Each firm produces a distinct product and is itself an industry. Chamberlin lumps together firms producing very closely related products and calls them product groups, such as cars, cigarettes, etc.
- g) **Selling Costs:** Under monopolistic competition where the product is differentiated, selling costs are essential to push up the sales. Besides, advertisement, it includes expenses on salesman, allowances to sellers for window displays, free service, free sampling, premium coupons, and gifts, etc.
- h) **Non-price Competition:** Under monopolistic competition, a firm increases sales and profits of his product without a cut in the price. The monopolistic competitor can

change his product either by varying its quality, packing, etc. or by changing promotional programs.

PRICING

Pricing is the process whereby a business sets the price at which it will sell its products and services, and may be part of the business's marketing plan. In setting prices, the business will take into account the price at which it could acquire the goods, the manufacturing cost, the market place, competition, market condition, brand, and quality of product.

Pricing can be a manual or automatic process of applying prices to purchase and sales orders, based on factors such as: a fixed amount, quantity break, promotion or sales campaign, specific vendor quote, price prevailing on entry, shipment or invoice date, combination of multiple orders or lines, and many others. Automated systems require more setup and maintenance but may prevent pricing errors. The needs of the consumer can be converted into demand only if the consumer has the willingness and capacity to buy the product. Thus, pricing is the most important concept in the field of marketing, it is used as a tactical decision in response to comparing market situations.

Types of Pricing

1. **Cost Plus Pricing:** One method used by businesses to determine how to price goods and services. In cost-based pricing the seller's costs are the primary consideration. Costs set the floor for the price that the company can charge. Therefore, cost-based pricing involves setting prices based on the costs for producing, distributing, and selling the product. In order to make some profit, a fair rate of return is added to account for efforts and risks.
2. **Pricing based on Firm's objectives:** If your business mission is to be a leader in your industry, you may want to consider a **sales maximization** pricing objective. On the other hand, **profit maximization** may be most appropriate if your business plan calls for growth in production in the near future, since you will need funding for facilities and labor.
3. **Competition based Pricing:** competition-based pricing involves setting prices based on competitors' strategies, costs, prices and market offerings. In highly competitive markets, consumers will base their judgements of a product's value on the prices that competitors charge for similar products.
 - a) **Penetration Pricing:** is a pricing strategy where the price of a product is initially set low to rapidly reach a wide fraction of the market and initiate word of mouth. The strategy works on the expectation that customers will switch to the new brand because of the lower price.
 - b) **Entry Deterrence Pricing:** In business, **entry deterrence** refers to any action taken by an existing business in a particular market that discourages potential entrants from entering into competition in that market. Under entry deterring pricing the price is kept low, thus making the market unattractive for other players.
 - c) **Going Rate Pricing:** The **Going-Rate Pricing** is a method adopted by the firms wherein the product is priced as per the rates prevailing in the market especially on par with the competitors.
4. **Retail Pricing:** Marketing channel categorically consists of at least two sections: wholesalers and retailers. These two would normally have different pricing considerations because they face different market conditions. The producer fixes a price for its product, the product then goes to the wholesaler, who is allowed some

commission on the company price; finally the retailer gets the product and charges a price that includes its own commission as well.

Product life cycle based pricing

As consumers, we buy millions of products every year. And just like us, these products have a life cycle. Older, long-established products eventually become less popular, while in contrast, the demand for new, more modern goods usually increases quite rapidly after they are launched. Because most companies understand the different product life cycle stages, and that the products they sell all have a limited lifespan, the majority of them will invest heavily in new product development in order to make sure that their businesses continue to grow.

Some of the most important stages through which product life cycle passes are as follows:

1. Introduction
2. Growth Stage
3. Maturity Stage
4. Saturation Stage
5. Decline Stage.

1. **Introduction:** The product is developed keeping in view a particular need of a set of consumers, and introduced in the market by initiating its commercial production.
2. **Growth Stage:** There is a rapid expansion in sales as the cumulative impact of the promotional expenditure helps in the market acceptance of the product as well as the reputation of the product gains around.
3. **Maturity Stage:** When the product enters the maturity stage the rate of growth of its sales declines, though the volume of sales keeps on increasing. This is so because most of the persons needing the product had already adopted it during the growth stage and now when the product enters its maturity stage, it faces a small and declining number of potential buyers. Consequently, the firm has to spend relatively increasing amount of sales promotion.
4. **Saturation Stage:** At this stage, the sales volume of the product ceases to grow. The only additional demand for the product happens to be its replacement demand
5. **Decline Stage:** Ultimately the product enters a stage of decline where its sale volume starts shifting down. The competitors have by then entered the market with substitutes and imitations and the product distinctiveness starts diminishing. Consequently, the sale of the product also starts declining.

Pricing Strategies based off Product life cycle stages:

1. **Price Skimming:** Price skimming is a product pricing strategy by which a firm charges the highest initial price that customers will pay. As the demand of the first customers is satisfied, the firm lowers the price to attract another, more price-sensitive segment. Firms often use this technique to recover the cost of development. Skimming is a useful strategy when: There are enough prospective customers willing to buy the product at the high price, The high price does not attract competitors. Lowering the price would have only a minor effect on increasing sales volume and reducing unit costs. The high price is interpreted as a sign of high quality.
2. **Product Bundling:** A product bundling strategy is a marketing approach where multiple products or components are packaged together into one bundled solution. When effective, a product bundling strategy can significantly increase profits on individual sales and over time Selling multiple products or components in one solution means a

greater initial return on the costs of acquiring a customer. Some companies use bundling as a way to package less popular products with hot selling items.

3. **Perceived value of Pricing or Psychological Pricing:** Psychological pricing uses the customer's emotional response to encourage sales. According to perceived value of pricing, value of goods for different consumers depends upon their perception of utility of the good. A segment of buyers believe that higher the price, better the quality; hence they would be willing to buy anything that is tagged at higher price.
4. **Value Pricing:** Under value pricing sellers try to create a high value of the product and charge a low price. This strategy is suitable for the maturity and saturation stage, when demand can be maintained by keeping focus on higher quality and lower cost. The assumption is that price should represent value for money to consumers, in other words the price charged should be lower than perceived value of product for the consumers.
5. **Loss Leader Pricing:** A loss leader is a product or service at a price that is not profitable but is sold or offered in order to attract new customers or to sell additional products and services to those customers. Under loss leader pricing multi product firms sell one product at a low price and compensate loss by other products.

Break Even Analysis

The break-even point (BEP) or break-even level represents the sales amount—in either unit (quantity) or revenue (sales) terms—that is required to cover total costs, consisting of both fixed and variable costs to the company. Total profit at the break-even point is zero. It is only possible for a firm to Break-even, if the dollar value of sales is higher than the variable cost per unit. This means that the selling price of the good must be higher than what the company paid for the good or its components for them to cover the initial price they paid (variable costs). Once they surpass the break-even price, the company can start making a profit.

The break-even point is one of the most commonly used concepts of financial analysis, and is not only limited to economic use, but can also be used by entrepreneurs, accountants, financial planners, managers and even marketers. Break-even points can be useful to all avenues of a business, as it allows employees to identify required outputs and work towards meeting these.

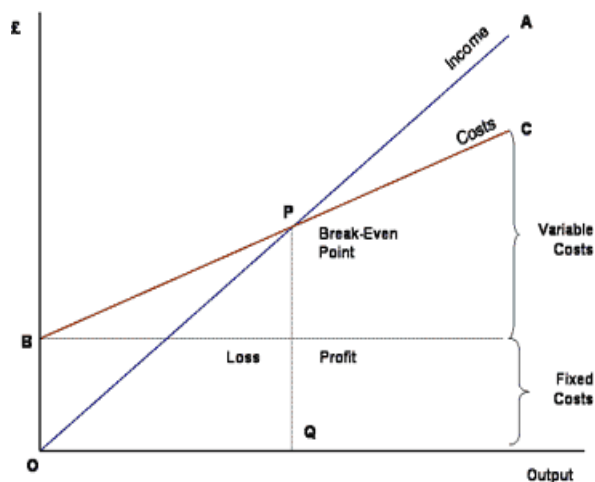
The Breakeven value is not a generic value and will vary dependent on the individual business. Some businesses may have a higher or lower breakeven point, however it is important that each business develop a break-even point calculation, as this will enable them to see the number of units they need to sell to cover their variable costs. Each sale will also make a contribution to the payment of fixed costs as well.

The main purpose of break-even analysis is to determine the minimum output that must be exceeded for a business to profit. It also is a rough indicator of the earnings impact of a marketing activity. A firm can analyze ideal output levels to be knowledgeable on the amount of sales and revenue that would meet and surpass the break-even point. If a business doesn't meet this level, it often becomes difficult to continue operation.

Methods of Break even Analysis are

1. **Graphical Method:** In its simplest form, the break-even chart is a graphical representation of costs at various levels of activity shown on the same chart as the variation of income (or sales, revenue) with the same variation in activity. The point

at which neither profit nor loss is made is known as the "break-even point" and is represented on the chart below by the intersection of the two lines:



2. **Equation Method:** the break-even point (BEP) (in terms of Unit Sales (X)) can be directly computed in terms of Total Revenue (TR) and Total Costs (TC) as

$$\begin{aligned}
 TR &= TC \\
 P \times X &= TFC + V \times X \\
 P \times X - V \times X &= TFC \\
 (P - V) \times X &= TFC \\
 X &= \frac{TFC}{P - V}
 \end{aligned}$$

Cost Volume Profit Analysis

Cost Volume Profit Analysis is used to determine how changes in costs and volume affect a company's operating income and net income. In performing this analysis, there are several assumptions made, including:

- Sales price per unit is constant.
- Variable costs per unit are constant.
- Total fixed costs are constant.
- Everything produced is sold.
- Costs are only affected because activity changes.
- If a company sells more than one product, they are sold in the same mix.

CVP analysis requires that all the company's costs, including manufacturing, selling, and administrative costs, be identified as variable or fixed

The CVP can be calculated by

1. Equation Method
 2. Contribution Margin and
 3. Contribution Margin Ratio
1. **Equation Method:** The basic CVP formula is the price per unit multiplied by the number of units sold equals the sum of total variable costs, total fixed costs and accounting profit. Total variable costs equal the number of units sold multiplied by the variable cost per unit.

$$P.Q = TFC + AVC.Q + \text{Profit}$$

2. **Contribution Margin:** is the selling price per unit minus the variable cost per unit. "Contribution" represents the portion of sales revenue that is not consumed by variable costs and so contributes to the coverage of fixed costs.

$$\text{Profit} = \text{Sales} - (\text{Variable Costs} + \text{Fixed Costs})$$

3. **Contribution Margin ratio:** The **Contribution Margin Ratio** is the percentage of Contribution over Total Revenue, which can be calculated from the unit contribution over unit price or total contribution over Total Revenue

$$\text{CMR} = \text{Total Contribution} / \text{Total revenue}$$