Unit-2: Theory of demand: meaning & determinants of demand law, expectation to law of demand, **THEORY OF SUPPLY**: meaning & determinants of supply, law of supply, exception to law of supply. **Cost analysis**: accounting costs and economic costs. Short run costs analysis: fixed, variable and total cost curves, average and marginal cost curves, run cost analysis: average and marginal cost curves.

OUTCOMES:

The outcomes of this theory include a better understanding of consumer behaviour, the ability to make informed decisions about pricing and production, and the ability to predict changes in market demand.
It explains how consumers make decisions about the goods and services they purchase. It helps to understand the relationship between the price of a good or service and the quantity that consumers are willing and able to buy.

MEANING OF DEMAND:

- Demand is **an economic concept that relates to a consumer's desire to purchase goods and services and willingness to pay a specific price for them**.
- An increase in price of a good or service tends to decrease the quantity demanded.
- In microeconomics, demand refers to the quantity of a good or service that consumers are willing and able to purchase at various prices.
- The definition of demand highlights four essential elements of demand:
  a) **Quantity of the commodity** c)**willingness to buy**
  b) **Price of the commodity**)**period of time**

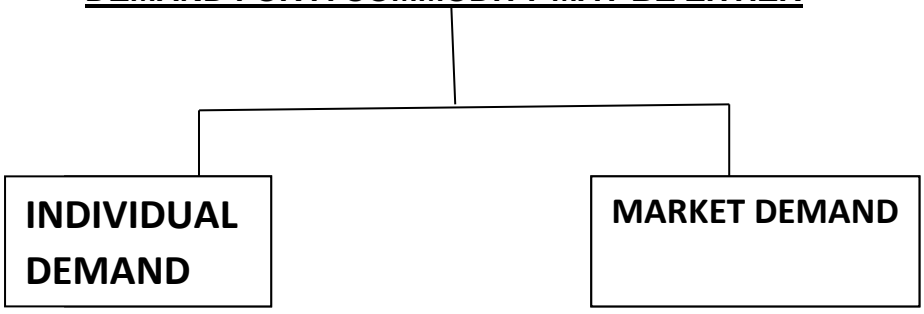
LET UNDERSTAND THE THREE DIFFERENT TERMS:

1. **DESIRE MEANS A MERE WISH TO HAVE A COMMODITY**: **FOR EXAMPLE**, desire of a poor person for a car with just RS200 in his pocket. So, desire is just a wish to posses something.
2. **WANT IS THAT DESIRE WHICH IS BACKED BY THE ABILITY AND WILLINGNESS TO SATISFY IT:**every desire is not a want but, a desire can become a want if the person is in the position to satisfy it. **FOR EXAMPLE,** in above example, if the poor person wins a lottery and now he has enough money to buy a car, then his desire for car will now be termed as want.
3. **DEMAND IS AN EXTENSION TO WANT AS IT HAS TWO MORE CHARACTERISTICS**:

   A) DEMAND IS ALWAYS DEFINED WITH REFERENCE TO PRICE: The demand for a commodity is always stated with reference to its price. With a change in price, quantity demanded may also change as more is demanded al lower price and less at higher price. Therefore, demand is meaningless without reference to price.

B) DEMAND IS ALWAYS WITH RESPECT TO A PERIOD OF TIME: demand is always expressed with reference to time. Even at the same price, demand may change, depending upon the time period under consideration. **FOR EXAMPLE:** demand for umbrellas is more in rainy season as compared to other season. The time frame might be of an hour, a day, a month or a year.

DEMAND FOR A COMMODITY MAY BE EITHER

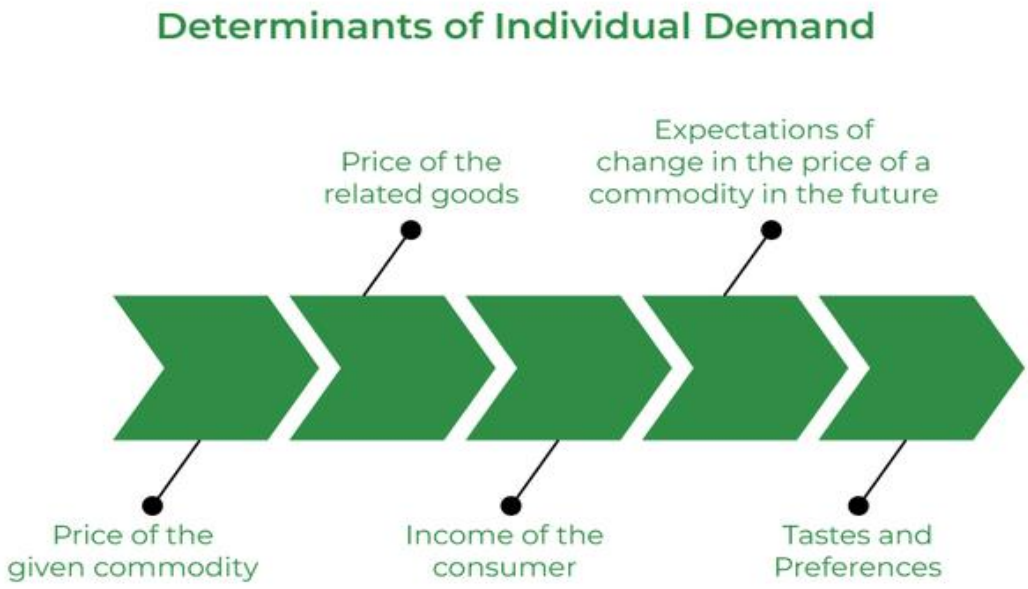


INDIVIDUAL DEMAND: refers to thequantityof a commodity that a consumer is willing and able to buy, at each possible price during a given period of time.

MARKET DEMAND: refers to the quantity of a commodity that all consumers are willing and able to buy, at each possible price during a given period of time.

DETERMINANTS OF INDIVIDUAL DEMAND

Demand for a commodity increases or decrease due to a number of factors. The various factors affecting demand are discussed below.



Unit 2: THEORY OF DEMAND

1. **PRICE OF A GIVEN COMMODITY:** it is the most important factor affecting demand for the given commodity. Generally, there exists an inverse relationship between price and quantity demanded. It means, as price increases, quantity demanded falls due to decrease in the satisfaction level of consumers.

FOR EXAMPLE: if price of given commodity (tea) increase, its quantity demanded will fall as satisfaction derived from tea will fall due to rise in its price.

2. **PRICE OF RELATED GOODS:**demand for the given commodity is also affected by change in price of the related goods. Related goods are of two types:

   a) **SUBSTITUTE GOODS:** substitute goods are those goods which can be used in place of one another for satisfaction of a particular want, like tea and coffee**An increase in the price of substitute leads to an increase in the demand for given commodity and vice versa.**
   FOR EXAMPLE: if a price of a substitute goods (coffee) increase, then demand for given commodity (tea) will rise as tea will become relatively cheaper in comparison to coffee **so demand for a given commodity is directly affected by change in price of substitute goods.**

   b) **COMPLEMENTARY GOODS:** complementary goods are those goods which are used together to satisfy a particular want, like tea and sugar. **An increase in the price of complementary goods leads to a decrease in the demand for given commodity and vice versa.**
   FOR EXAMPLE: if the price of acomplementary goods (sugar) increase, then demand for given commodity (tea) will fall as it will be relatively costlier to use both the goods together. **So demand for a given commodity is inversely affected by changes in price of complementary goods**.

3. **INCOME OF THE CONSUMER:** demand for a commodity is also affected by income of the consumer however the effect of change in income on demand depends on the nature of the commodity under consideration.

- If a given commodity is a **normal good**, then an increase in income leads to rise in its demand, while a decrease in income reduces the demand.
- If the given commodity is an **inferior good**, then an increase in income reduce the demand, while a decrease in income leads to rise in demand.

FOR EXAMPLE: suppose income of consumer increase. As a result, the consumer reduces consumption of toned milk and increase consumption of full cream milk. In this case, "toned milk" is an inferior goodfortheconsumer and "full cream milk" is a normal good.

NOTE: No commodity is inferior. If any commodity is purchased by a consumer just because of his low income level, then this commodity is termed as **inferior commodity** for that person.
For example: Bajra is a normal commodity for a rich person. But, if low income of a poor person forces him to consume bajraeveryday, then bajra will be an inferior commodity for him.
It is not the consumer but the income level of the consumer which determines whether a good is normal or inferior. So inferiority is a relative concept.

4. **TASTES AND PREFERENCES:** tastes and preferences of the consumer directly influenced the demand for a commodity. They include changes in fashion, customs, habits etc. if a commodity is in fashion or is preferred by the consumer, then demand for a such commodity rises. On the other hand, demand for a commodity falls, if the consumers have no taste for that commodity.

5. **EXPECTATIONS OF CHANGE IN THE PRICE IN FUTURE:** if the price of a certain commodity is expected to increase in near future, then people will buy more of that commodity than what they normally buy. there exists a direct relationship between expectation of change in the prices in future and change in demand in the current period**. FOR EXAMPLE**: if the price of petrol is expected to rise in future, its present demand will increase.

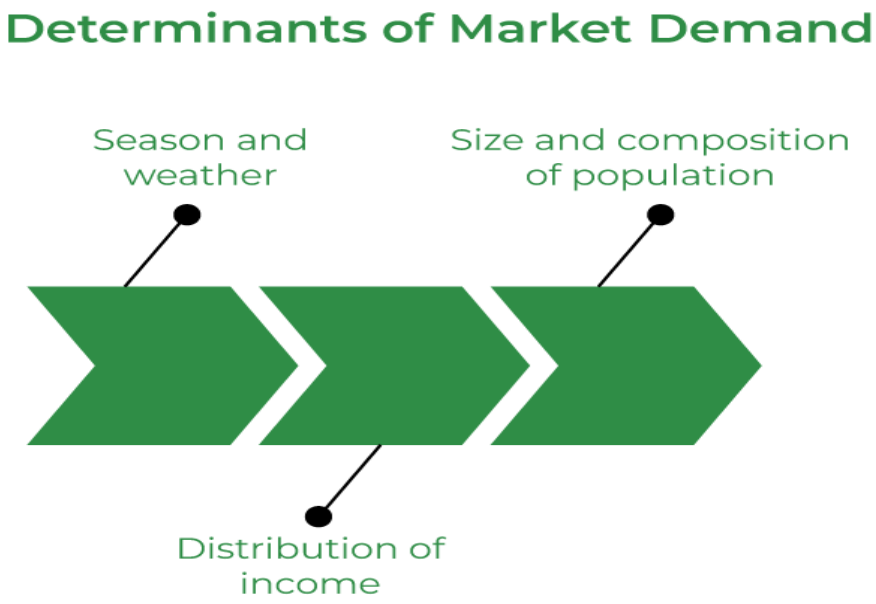
CHANGE IN QUANTITY DEMANDED VS CHANGE IN DEMAND

- **CHANGE IN QUANTITY DEMANDED:** Whenever demanded for the given commodity changes due to change in its own price, then such change in demand is known as**" change in quantity demanded**" **for example:** if demand for pepsi changes due to change in its own price, then such change in demand for pepsi is known as change in quantity demanded.
- **CHANGE IN DEMAND:** whenever demand for the given commodity changes due to factors other than prices, then such change in demand is known as "**change in demand". for example**: if demand for pepsi change due to change in price of coke or due to change in income or due to a

change in taste, then such changes in demand for pepsi is known as change in demand.

DETERMINANTS OF MARKET DEMAND

There are certain special features of market demand, which are not observed in case of individual demand. market demand is influenced by all the factors affecting individuals demand for a commodity.



1. **SEASON AND WEATHER:** The seasonal and weather conditions also affect the market demand for a commodity. **For example,**during winters, demand for woollen clothes and jackets increase, whereas, market demand for raincoat and umbrellas increase during the rainy season.
2. **DISTRIBUTION OF INCOME:**If income in the country is equitably distributed, then market demand for commodity will be more. However, if income distributed is uneven, i.e. people are either very rich or very poor, then market demand will remain at lower level.
3. **Size and composition of population:**Market demand for a commodity is affected by size of population in the country. Increase in population raise the market demand, while decrease in population reduces the market demand.

   Composition of population, i.e. ratio of males, females, children and number of old people in the population also affect the demand for a commodity**. For example**: if a market has larger

proportion of women, then there will be more demand for articles of their use such as lipstick, sarees,etc.

Law of demand:

The law of demand states that, all other things being equal, the quantity demanded of a good or service will decrease as the price of that good or service increases, and vice versa. In other words, there is an inverse relationship between price and quantity demanded. This relationship is represented graphically by a downward-sloping demand curve.

ASSUMPTIONS OF LAW OF DEMAND

The law of demand is based on certain assumptions, including:

1. **Rationality of consumers:** It is assumed that consumers act rationally and make decisions based on their own self-interest.
2. **Constant tastes and preferences**: Tastes and preferences of consumers are assumed to be constant, meaning that they do not change over time.
3. **Constant income**: Income is assumed to be constant, and consumers have a fixed budget to spend on goods and services.
4. **Constant price of related goods**: The prices of related goods and services, such as substitutes and complements, are assumed to be constant.
5. **Perfect information**: It is assumed that consumers have perfect information about the prices, quality and availability of goods and services.
6. **No external factors**: The law of demand assumes that there are no external factors that could affect the demand of a good or service, **such as government policies or natural disasters.**

LAW OF DEMAND CAN BE BETTER UNDERSTOOD WITH THE HELP OF TABLE:

PRICE	QUANTITY DEMANDED
6	1
5	2
4	3
3	4
2	5
1	6

In above table clearly shows that more and more units of commodity are demanded, when price of the commodity falls.

DEMAND CURVE:

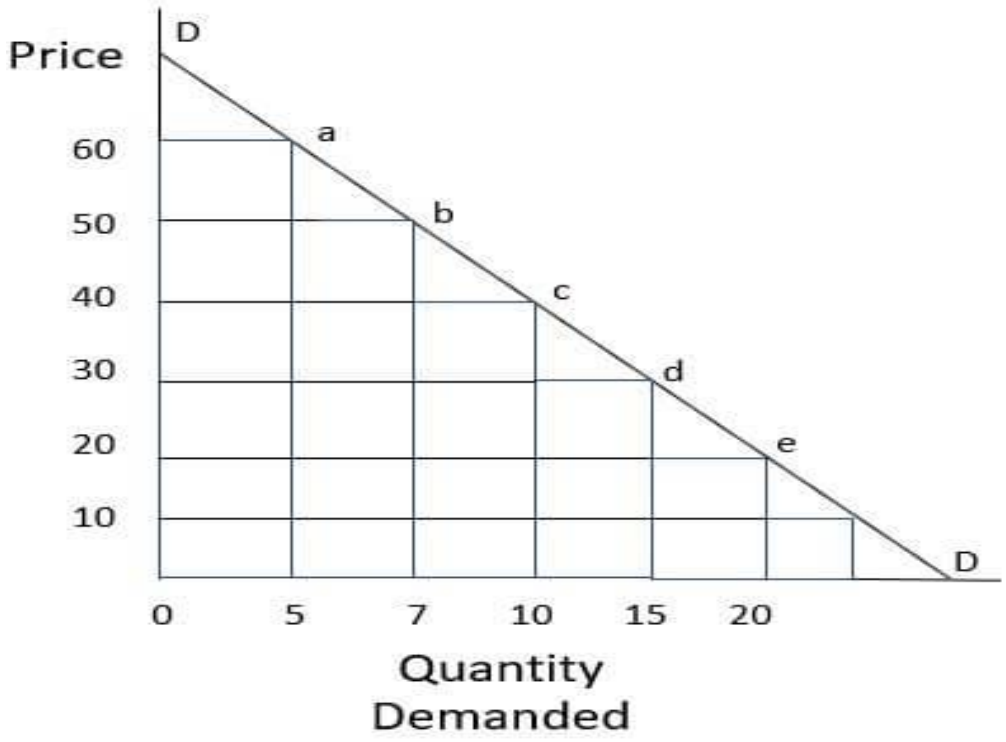


Figure 1

In above curve shows that the demand curve DD slopes downwards from left to right, **indicating an inverse relationship between price and quantity demanded**.

Important Facts about Law of Demand:

1. Inverse Relationship:

It states the inverse relationship between price and quantity demanded. It simply affirms that an increase in price will tend to reduce the quantity demanded and a fall in price will lead to an increase in the quantity demanded.

2. Qualitative, not Quantitative:

It makes a qualitative statement only, i.e. it indicates the direction of change in the amount demanded and does not indicate the magnitude of change.

3. No Proportional Relationship:

It does not establish any proportional relationship between change in price and the resultant change in demand. If the price rises by 10%, quantity demanded may fall by any proportion.

4. One-Sided: Law of demand is one sided as it only explains the effect of change in price on the quantity demanded. It states nothing about the effect of change in quantity demanded on the price of the commodity.

Reasons for Law of Demand:

Let us now try to understand, why does the law of demand operate, i.e. why does a consumer buy more at lower price than at a higher price.

The various reasons for operation of Law of Demand are:

1. Law of Diminishing Marginal Utility:

- Law of diminishing marginal utility states that as we consume more and more units of a commodity, the utility derived from each successive unit goes on decreasing. So, demand for a commodity depends on its utility.
- If the consumer gets more satisfaction, he will pay more. As a result, consumer will not be prepared to pay the same price for additional units of the commodity. The consumer will buy more units of the commodity only when the price falls.
- Law of diminishing marginal utility is considered as the basic reason for operation of 'Law of Demand'.

2. Substitution Effect:

- Substitution effect refers to substituting one commodity in place of other when it becomes relatively cheaper. When price of the given commodity falls, it becomes relatively cheaper as compared to its substitute (assuming no change in price of substitute). As a result, demand for the given commodity rises.
- For example, if price of given commodity (say, Pepsi) falls, with no change in price of its substitute (say, Coke), then Pepsi will become relatively cheaper and will be substituted for coke, i.e. demand for Pepsi will rise.

3. Income Effect:

- Income effect refers to effect on demand when real income of the consumer changes due to change in price of the given commodity. When price of the given commodity falls, it increases the purchasing power (real income) of the consumer. As a result, he can purchase more of the given commodity with the same money income.
- For example, suppose Isha buys 4 chocolates @ Rs. 10 each with her pocket money of Rs. 40. If price of chocolate falls to Rs. 8 each, then with the same money income, Isha can buy 5 chocolates due to an increase in her real income.

4. Additional Customers:

- When price of a commodity falls, many new consumers, who were not in a position to buy it earlier due to its high price, starts purchasing it. In addition to new customers, old consumers of the commodity start demanding more due to its reduced price

- For example, if price of ice-cream family pack falls from Rs. 100 to Rs. 50 per pack, then many consumers who were not in a position to afford the ice-cream earlier can now buy it with decrease in its price. Moreover, the old customers of ice-cream can now consume more. As a result, its total demand increases.

5. Different Uses:

- Some commodities like milk, electricity, etc. have several uses, some of which are more important than the others. When price of such a good (say, milk) increases, its uses get restricted to the most important purpose (say, drinking) and demand for less important uses (like cheese, butter, etc.) gets reduced. However, when the price of such a commodity decreases, the commodity is put to all its uses, whether important or not.

Exceptions to Law of Demand:

- As a general rule, demand curve slopes downwards, showing the inverse relationship between price and quantity demanded. However, in certain special circumstances, the reverse may occur, i.e. a rise in price may increase the demand. These circumstances are known as 'Exceptions to the Law of Demand'.

Some of the Important Exceptions are:

1. Giffen Goods:

- These are special kind of inferior goods on which the consumer spends a large part of his income and their demand rises with an increase in price and demand falls with decrease in price.

- For example, in our country, it is often seen that when price of coarse cereals like jowar and bajra falls, the consumers have a tendency to spend less on them and shift over to superior cereals like wheat and rice. **This phenomenon, popularly known as' Giffen's Paradox' was first observed by Sir Robert Giffen**.

2. Status Symbol Goods or Goods of Ostentation:

- The exception relates to certain prestige goods which are used as status symbols. For example, diamonds, gold, antique paintings, etc. are bought due to the prestige they confer upon the possessor. These are wanted by the rich persons for prestige and distinction. The higher the price, the higher will be the demand for such goods.

3. Fear of Shortage:

- If the consumers expect a shortage or scarcity of a particular commodity in the near future, then they would start buying more and more of that commodity in the current period even if their prices are rising. The consumers demand more due to fear of further rise in prices. For example, during emergencies like war, famines, etc., consumers demand goods even at higher prices due to fear of shortage and general insecurity.

4. Ignorance:

- Consumers may buy more of a commodity at a higher price when they are ignorant of the prevailing prices of the commodity in the market.

5. Fashion related goods:

- Goods related to fashion do not follow the law of demand and their demand increases even with a rise in their prices. For example, if any particular type of dress is in fashion, then demand for such dress will increase even if its price is rising.

6. Necessities of Life: rice, wheat, salt, medicines, etc. are purchased even if their prices Another exception occurs in the use of such commodities, which become necessities of life due to their constant use. For example, commodities like increase.

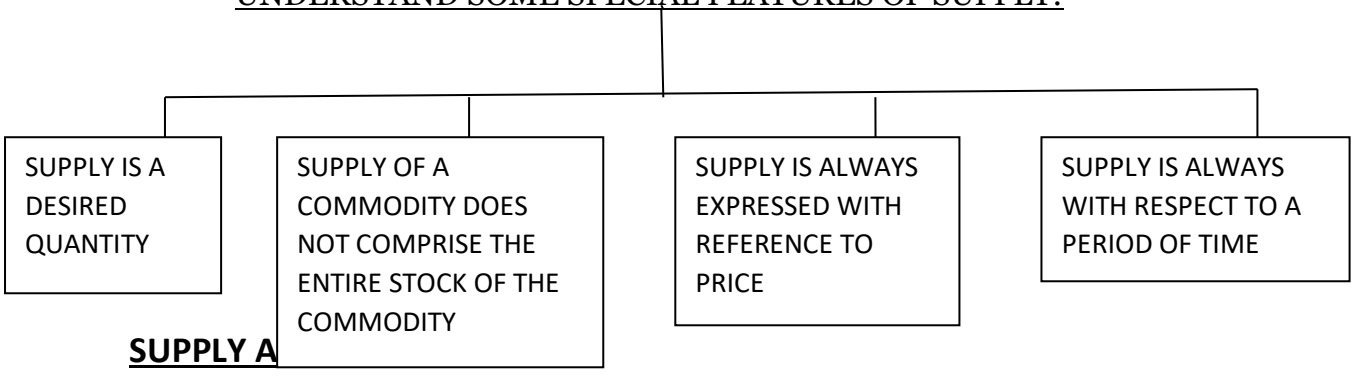
7. Change in Weather:

- With change in season/weather, demand for certain commodities also changes, irrespective of any change in their prices. For example, demand for umbrellas increases in rainy season even with an increase in their prices. It must be noted that in normal conditions and considering the given assumptions, 'Law of Demand' is universally applicable.

MEANING OF SUPPLY: Like demand, supply is also expressed as a relationship between price and quantity.

- **Supply refers to quantity of a commodity that a firm is willing and able to offer for sale at a given price during a given period of time.**

UNDERSTAND SOME SPECIAL FEATURES OF SUPPLY:



SUPPLY A

Unit 2: THEORY OF DEMAND

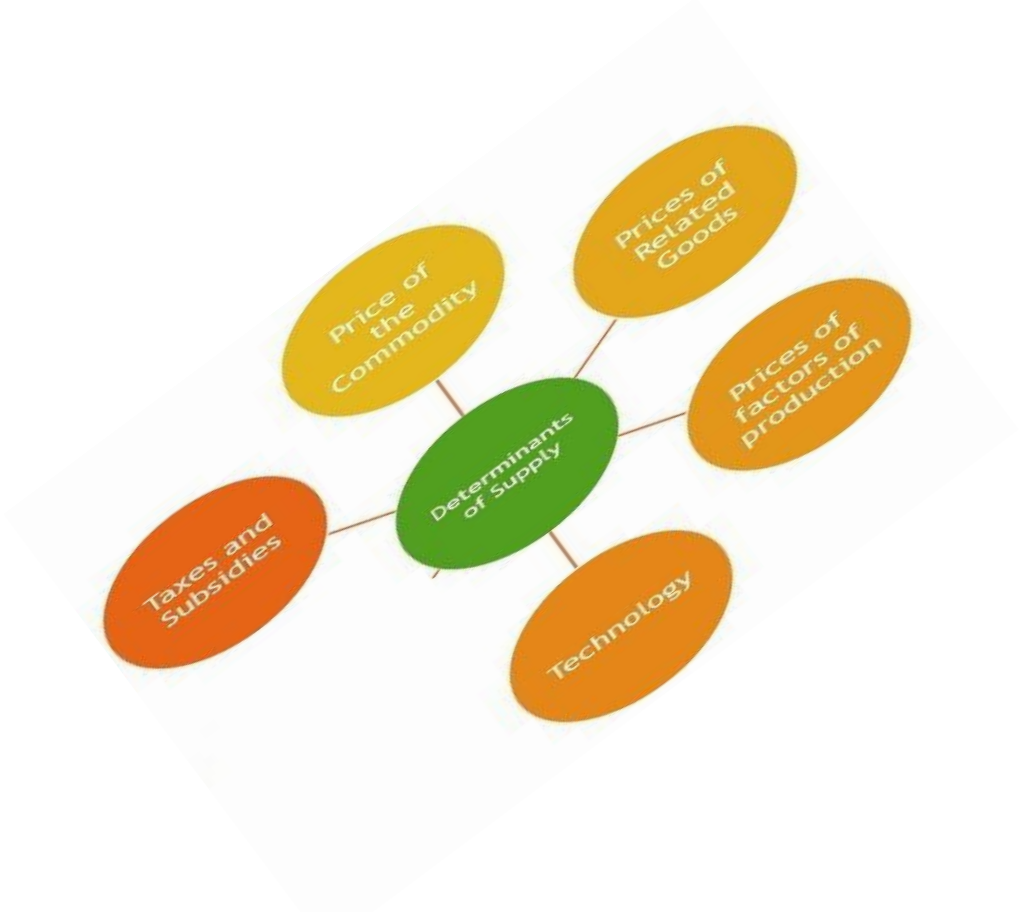
The term 'supply' is often confused with 'stock' of the commodity. However, in economics the two terms are different.

- **Stock refers to total quantity of a particular commodity that is available with the firm at a particular point of time.**
- On other hand, supply is that part of stock which a produce is willing to bring in the market for sale.
- Stock can never be less than the supply.
- For example:, if a seller has 50 tonnes sugar in his godown and he is willing to sell 30 tonnes at 37rs per kg, then supply is 30 tonnes and stock is 50 tonnes.

LIKE DEMAND, SUPPLY ALSO CAN BE EITHER FOR A SINGLE SELLER (INDIVIDUAL SUPPLY) OR FOR ALL THE SELLERS (MARKET SUPPLY).

1. **INDIVIDUAL SUPPLY:** refers to quantity of a commodity that an individual firm is willing and able to offer for sale at a given price during a given period of time.
2. **MARKET SUPPLY:** refers to quantity of a commodity that all the firms are willing and able to offer for sale at a given price during period of time.

DETERMINANTS OF INDIVIDUAL SUPPLY



1. PRICE OF THE COMMODITY:

- As a general rule, price of a commodity and its supply are directly related.

- It means, as price increases, the quantity supplied of the given commodity also raises and vice-versa. It happens because at higher prices, there are greater chances of making profit. It induces the firm to offer more for sale in the market.

2. PRICES OF RELATED GOODS:

- The quantity supplied of a commodity depends not only on its price, but also on the prices of other commodities.
- Increase in the prices of other goods makes them more profitable in comparison to the given commodity. As a result, the firm shifts its limited resources from production of the given commodity to production of other goods.

For example: increase in the price of other good (wheat) will induce the farmer to use land for cultivation of wheat in place of the given commodity (rice).

3. PRICES OF FACTORS OF PRODUCTION:

- When the amount payable to factors of production and cost of inputs increases, the cost of production also increases. This decease the profitability. As a result, seller reduces the supply of the commodity.
- On the other hand, decrease in prices of factors of production or inputs; increase the supply due to fall in cost of production.
- **For example:** to make ice-cream, firms need various inputs like cream, sugar, machine, labour etc. When price of one or more of these inputs rises, producing ice-cream will become less profitable and firms supply fewer ice-cream.

4. TECHNOLOGY:

- Technology changes influence the supply of a commodity. Advanced and improved technology reduces the cost of production, which raises the profit margin. It induces the seller to increase the supply.

5. TAXES AND SUBSIDIES:

- Increase in taxes raises the cost of production and, thus, reduces the supply, due to lower profit margin.
- On the other hand, tax concessions and subsidies increase the supply as the make it more profitable for the firms to supply goods.

DETERMINANTS OF MARKET SUPPLY

- It indicates various quantity of a commodity that all sellers are willing to sell in the market at various prices and at different times.

- There are various factors that influence the supply of a commodity in the market. The factors or determinants that influence market supply are as follows:

1. **Price of the commodity**: The supply of a commodity is directly related to its price. Generally, more quantity of a commodity is offered for sale at higher price, and less quantity is offered for sale at a lower price.

2. **Availability of inputs**: -The supply is affected by the availability of inputs for production. If there is shortage of inputs in the market, the production would be less, and therefore, the supply would be lower.

3. **Cost of production:-** **A** rise in production cost may reduce the supply in the market, especially, when higher costs are not viable (possible), and a fall in production cost may induce the producer to produce more and accordingly supply more in the market.

4. **Nature of the Market: -**Supply of a commodity is influenced by the nature of a market. In a highly competitive market, the supply may be higher. In a monopoly market the supply may be lower.

5. **Distribution Facilities: -The** supply is influenced by distribution facilities. For instance, if there is a good network of transport and warehousing facilities, the supply can be more and vice versa.

6. **Nature of Workforce:-The** supply **is** influenced by the nature of workforce available to the producers. If the workforce is competent and dedicated, then the production would be higher,

7. **Technology:-** The type of technology used by producers influences the production. Modern technology not only improves the quality, but also the quantity of production.

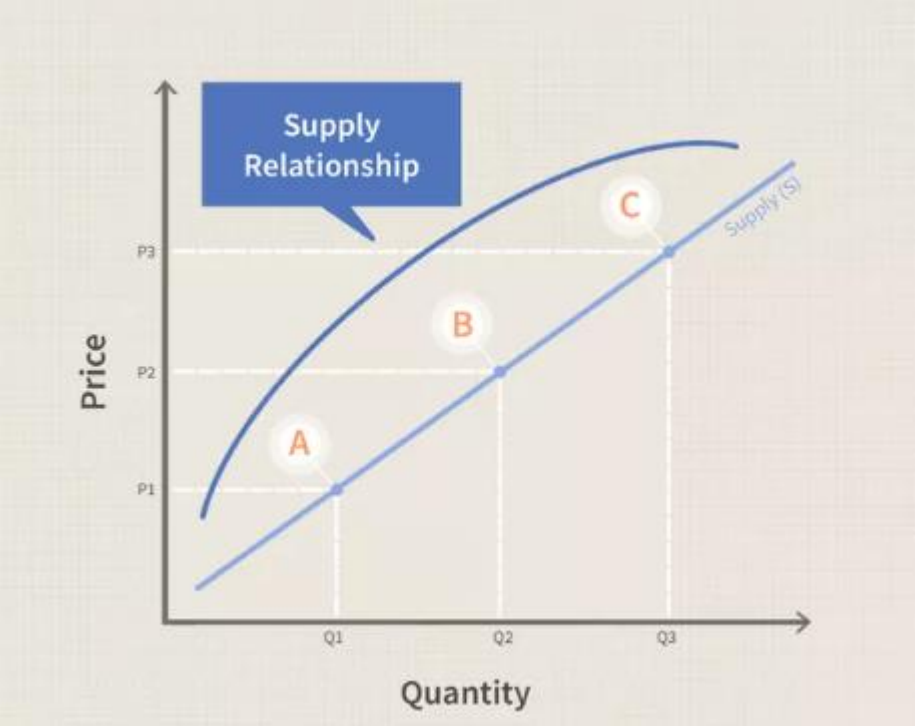
8. **Size of the Market: -The** size of the market greatly influences the supply. Larger the size of the market, there will be more production, and more will be the supply and vice versa.

What Is the Law of Supply?

- The law of supply is the microeconomic law that states that, all other factors being equal, as the price of a good or service increases, the quantity of goods or services that suppliers offer will increase, and vice versa.
- The law of supply says that as the price of an item goes up, suppliers will attempt to maximize their profits by increasing the number of items for sale.
- The law of supply says that a higher price will induce producers to supply a higher quantity to the market.
- Because businesses seek to increase revenue, when they expect to receive a higher price for something, they will produce more of it.
- Meanwhile, if prices fall, suppliers are disincentivized from producing as much.

Understanding the Law of Supply

The chart below depicts the law of supply using a supply curve, which is upward sloping. A, B, and C are points on the supply curve. Each point on the curve reflects a direct correlation between quantities supplied (Q) and price (P). So, at point A, the quantity supplied will be Q1 and the price will be P1, and so on.



The supply curve is upward sloping because, over time, suppliers can choose how much of their goods to produce and later bring to market. At any given point in time, however, the supply that sellers bring to market is fixed, and sellers simply face a decision to either sell or withhold their stock from a sale; consumer demand sets the price, and sellers can only charge what the market will bear.

The law of supply is one of the most fundamental concepts in economics. It works with the law of demand to explain how market economies allocate resources and determine the prices of goods and services.

FOR EXAMPLE:

- When college students learn that computer engineering jobs pay more than English professor jobs, the supply of students with majors in computer engineering will increase.
- When consumers start paying more for cupcakes than for donuts, bakeries will increase their output of cupcakes and reduce their output of donuts in order to increase their profits.

LAW OF SUPPLY CAN BE BETTER UNDERSTOOD WITH THE HELP OF TABLE:

Clearly shows that more and more units of the commodity are being offered for sale as the price of the commodity is increase. As seen in TABLE, supply curve SS slope upwards from left to right, indicating direct relationship between price and quantity supplied.

PRICE	QUANTITY
1	10
2	20
3	30
4	40

EXCEPTIONS TO LAW OF SUPPLY:

As a general rule, supply curve slopes upwards, showing that quantity supplied rises with a rise in price. However, in certain cases, positive relationship between supply and price may not hold true.

THE VARIOUS EXCEPTIONS TO THE LAW OF SUPPLY ARE:

1. **Closure of Business** - In some circumstances when a business is on the edge of closure, the seller may sell the products even at cheap prices. The retailer does this to clear the supply of stock. In this case, the law of supply does not hold and serves as an exception to the law of supply.
2. **Agricultural Products** - It is challenging to increase the agricultural produce at a certain level as land is a limited resource. It shows that if the prices of land increase, the supply may not get increased.
3. **Monopoly** - The situation when there is only one vendor of a service refers to monopoly. The single seller is the price maker and has control over different prices. The seller may not be willing to raise the supply even if the prices are going high; hence it is an exception to the law of supply.
4. **Competition** - When there is high competition in the market, the sellers may sell goods in high quantities at low rates. It refers to a situation where the law of supply does not hold.
5. **Out of Fashion Goods** - The up-to-date goods that are in trend often have high prices. However, those goods, which are out of fashion, have cheap prices. The sellers may sell these out of fashion goods even at cheap rates.
6. **Perishable Good**- In case of perishable goods, like vegetables, fruits, etc., sellers will be ready to sell more even if the prices are falling. It happens because sellers cannot hold such goods for long term.

MEANING OF COST : Cost is the total expenditure incurred in producing a commodity. **In economics, Cost is the sum total of explicit cost and implicit cost.**

1. EXPLICIT COST (accounting cost): it is the actual money expenditures on inputs or payment made to outsiders for hiring their factor services.

For example: wages paid to the employees, rent paid for hired premises (buildings) and payment for raw materials etc.

2. IMPLICIT COST: It is the estimated value of the inputs supplied by the owners including normal profit.

For example: interest on own capital, rent of own land, salary for the services of entrepreneur, etc

So, cost in economics includes actual expenditure on inputs (i.e. explicit cost) and the imputed value of the inputs supplied by the owner (i.e. implicit cost).

Note:

- **Economic cost** of production includes not only the **accounting cost** (i.e. the explicit cost) but also the **implicit cost**.
- The sum of explicit cost and implicit cost is the total cost of production of a commodity is called the **economic cost**.

SHORT RUN COST: Short-run cost refers to the cost of producing a good or service over a limited period of time in which at least one input (usually capital) is fixed, while the others can be varied. In the short run, the firm cannot change its plant size, but can change the level of inputs **such as labour, raw materials, and energy to increase or decrease production.**

There are two types of short-run costs:

1. **Variable Costs**: These are costs that vary directly with the level of production and include raw materials, labour, and energy costs.
2. **Fixed Costs**: These are costs that do not change with the level of production in the short-run and include plant and equipment, rent, insurance, and salaries of key personnel.

    - **The sum of total fixed cost and variable cost is equal to total cost.**
    - **TC= TVC (** TOTAL VARIABLE COST**) + TFC(** TOTAL FIXED COST**)**
    - Fixed cost remains the same, whether output is large, small or even zero.

OUTPUT	TOTAL FIXED COST
0	12
1	12
2	12
3	12
4	12
5	12

Fixed costs are diagrammatically shows in fig.3 units of output are measured along the X-axis and fixed costs along the Y-axis.

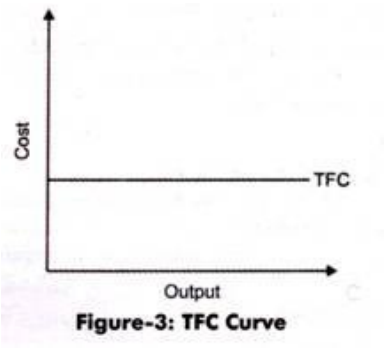


Figure-3: TFC Curve

TFC is the fixed cost curve obtained by plotting the points shown in above table.

The curve makes an intercept on the Y-axis, which is equal to the fixed cost of rs12.

TFC curve is a horizontal straight line parallel to the X-axis because TFC remains same at all levels of output, even if the output is zero.

TOTAL VARIABLE COST (TVC) OR VARIABLE COST (VC)

- Variable cost refers to those costs, which vary directly with the level of output.
- **For example**: payment for raw material, power fuel, wages of casual labour, etc.
- **VARIABLE COST IS ALSO KNOWN IS "PRIME COST", DIRECT COST" OR "AVOIDABLE COST"**.

LET US DISCUSS THE CONCEPT OF VARIABLE COST WITH THE HELP OF DIAGRAM AND CURVE:

OUTPUT	TOTAL VARIABLE COST
0	0
1	6
2	10
3	15

4	24

TOTAL VARIABLE COST CURVE:

In above curve, units of output are measured along the X-axis and variable cost along the Y-axis. TVS is the variable cost curve obtained by plotting the points shown in above table.

As seen in the above curve, TVC curve starts from the origin indicating that when output is zero, variable cost is also zero.

TVC is an inversely s-shaped curve due to the law of variable proportions.

DIFFERENCE BETWEEN TVC AND TFC:

	Fixed Costs	Variable Costs
Definition	Costs that don't change in relation to production volume	Costs that vary/ change in relation to production volume
Nature	Fixed costs are time-related, as they remain constant for a period of time	Variable costs are volume-related, as they change with the changes in production volume
When production increases/ decreases	The total fixed cost stays the same	Total variable cost increase/ decrease
Examples	Rent, advertising, depreciation, insurance, etc.	Direct materials (sugar, egg, wood, cement), direct labor (wages of part-time staff)

TOTAL COST (TC): Total cost (TC) is the total expenditure incurred by a firm on the factors of production required for the production of a commodity.

- TC is the sum of total fixed cost (TFC) and total variable cost (TVC) at various levels of output. Since TFC remains same at all levels of outputs, the change in TC is entirely due to TVC.

THE CONCEPT OF TOTAL COST CAN BE BETTER UNDERSTOOD THROUGH TABLE AND CURVE:

OUTPUT	TFC	TVC	TC(TFC+TVC)
0	12	0	**12**
1	12	6	**18**
2	12	10	**22**
3	12	15	**27**
4	12	24	**36**

CURVE OF THE TC,TVC,TFC:

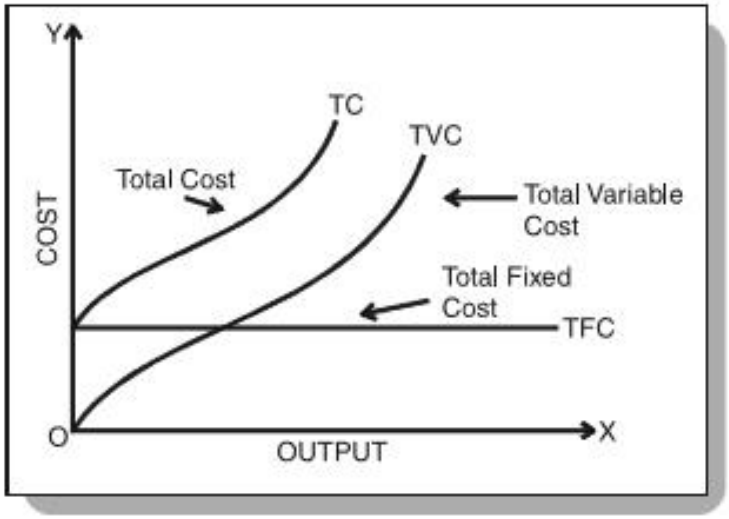


Fig. 5 : Short run Total Cost Curves

- **TC** is also inversely s-shaped as TC derives its shape from TVC.
- TC is equal to TFC (rs12) at zero output.
- TC and TVC curves are parallel to each other as vertical distance between them id TFC, which remains constant at all output levels.
- **The change in TC is entirely due to TVC as TFC is constant at all level of output, TC= TFC at zero output as variable cost is zero. With increase in output, TC also increases by the extent of increase in TVC.**

AVERAGE COST:

- Average cost is the cost per unit manufactured in a production run. It represents the average amount of money spent to produce a product. This amount can vary, depending on the number of units produced.
- Generally, the average cost declines as the number of units produced increases, as the manufacturer takes advantage of increasing efficiencies.

How to Calculate Average Cost

To calculate average cost, aggregate all fixed costs and variable costs associated with a production run, and divide by the number of units produced. This calculation does not include any administrative expenses. The average cost formula is:

(Fixed costs + Variable costs) / Number of units produced = Average cost

Example of Average Cost:

ABC International's manufacturing department completes a production run of 10,000 widgets. The fixed costs of the production run were $30,000, plus $2 of variable costs for each unit produced. The resulting calculation is:

($30,000 Fixed costs + $20,000 Variable costs) / 10,000 Units = $5 average cost

The three kinds of 'per unit cost' etc

1. AVERAGE FIXED COST (AFC)
2. AVERAGE VARIABLE COST(AVC)
3. AVERAGE TOTAL COST (ATC) **OR** AVERAGE COST (AC)

AVERAGE FIXED COST (AFC): Average fixed cost refers to the per unit fixed cost of production. It is calculated by dividing TFC by total output.

Average Fixed Cost formula = Total Fixed Cost / Output

AFC UNDERSTOOD WITH THE HELP OF TABLE:

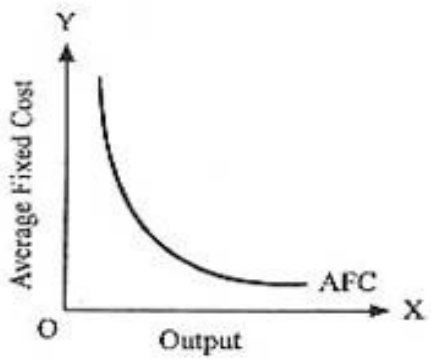
OUTPUT	TFC	AFC=TFC/OUTPUT

0	12	12/0 =∞
1	12	12/1 =12
2	12	12/2 =6
3	12	12/3 =4
4	12	12/4 =3
5	12	12/5 =2.40

As seen in table AFC falls with the rise in output because constant TFC is divided by increasing output.

CURVE OF AFC:

AFC curve is a rectangular hyperbola, i.e. area under AFC curve remains same at different points.



- AFC curve slope downwards as AFC falls with increase in output.
- AFC curve is a rectangular hyperbola, i.e. area under the curve remains same at all points.
- AFC can never touch the x-axis as TFC can never be ZERO.
- AFC curve can never touch the y-axis because at zero level of output, TFC is positive value and any positive value divided by zero will be an infinite value.

AVERAGE VARIABLE COST:

Average variable cost refers to the per unit variable cost of production.it is calculated by dividing TVC by total output.

OUTPUT	TVC (total variable cost)	AVC= TVC/OUTPUT
0	0	-
1	6	6/1 =6
2	10	10/2 =5
3	15	15/3 =5
4	24	24/4 =6
5	35	35/5 =7

Average Variable Cost Formula

$$\text{Average Variable Cost} = \frac{\text{Variable Cost}}{\text{Output}}$$

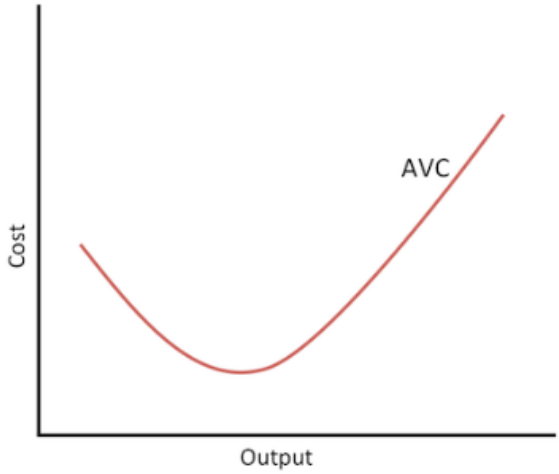
$$\text{Average Variable Cost} = \text{Average Total Cost} - \text{Average Fixed Cost}$$

\

AVC UNDERSTOOD WITH THE HELP OF TABLE:

As seen in table, AVC initially falls with increase in output and after reaching its maximum level of rs5, it starts rising.

AVERAGE VARIABLE COST CURVE:



AVC curve in fig is obtained by plotting the points shown in table. AVC is a U-SHAPPED CURVE as it initially falls and then remains constant for a while and finally, it starts increasing.

AVERAGE TOTAL COST (ATC) OR AVERAGE COST (AC):

Average cost refers to the per unit total cost of production. It is calculated by dividing TC by total output.

Average cost is also defined as the sum of average fixed cost (AFC) and average variable cost (AVC)

I.e. AC= AFC+AVC

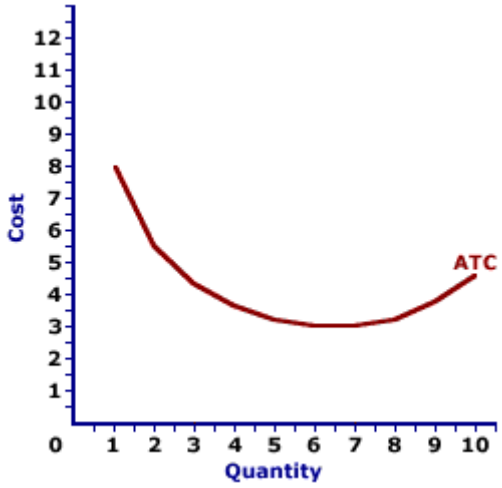
UNDERSTOOD WITH THE HELP OF TABLE AND CURVE:

OUTPUT	AFC	AVC	AC= AFC+AVC

0	∞	-----	-----
1	12	6	12+6 = 18
2	6	5	6+5 =11
3	4	5	4+5 =9
4	3	6	3+6 =9
5	2.40	7	2.40 +7 =9.40

As seen in table, AC is calculated by adding AFC and AVC.

CURVE:



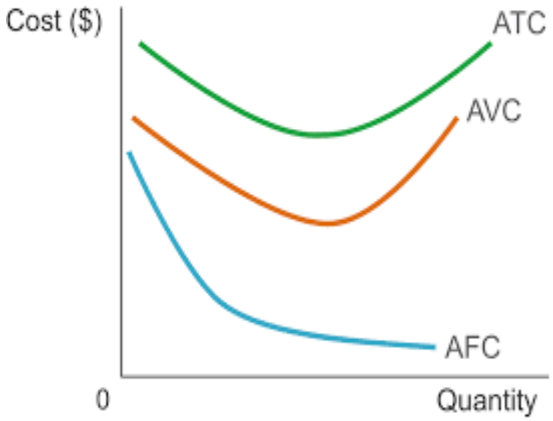
AC curve is U-SHAPPED curve. It means AC initially falls (1st phase), and after reaching its minimum point (2nd-phase), it starts rising (3rd-phase).

1st-phase: when both AFC and AVC fall till the level of 2 units of output, AC also falls i.e. till point A.

2nd-phase: from 2 units to 3 units, AFC continues to fall, but AVC remains constant. So, AC falls (due to falling AFC) till it reaches its minimum point 'B'. From 3 units to 4 units, fall in AFC (by rs1) is equal to rise in AVC (by rs1). So, AC remains constant.

3rd-phase: after 4 units of output, rise in AVC (by rs1) is more than fall in AFC (by rs0.60) and, therefore, AC start rising.

IMPORTANT OBSERVATIONS: AC,AVC AND AFC:



1. AC curve will always lie above the AVC curve (see above curve) because AC, al all levels of output includes both AVC and AFC.
2. AVC reaches its minimum point (point B) at a level of output lower than that of AC (point A) because when AVC is at its minimum points, AC is still falling because of falling AFC.
3. As the output increase, the gap between AC and AVC curves decrease, but they never intersect each other. it happens because the vertical distance between them is AFC, which can never be zero.

MARGINAL COST: marginal cost refers to addition to total cost when one more unit of output is produced.

For example: , if TC of producing 2units is rs200 and TC of producing 3 units is rs240, then MC=240-200=RS40.

$$MCn = TCn - TCn\text{-}1$$

Where:
N= number of units produced
MCn= Marginal cost of the nth unit
TCn= Total cost of n units
TCn-1= total cost of (n-1) units.

Marginal Cost = Total Cost – Fixed Cost

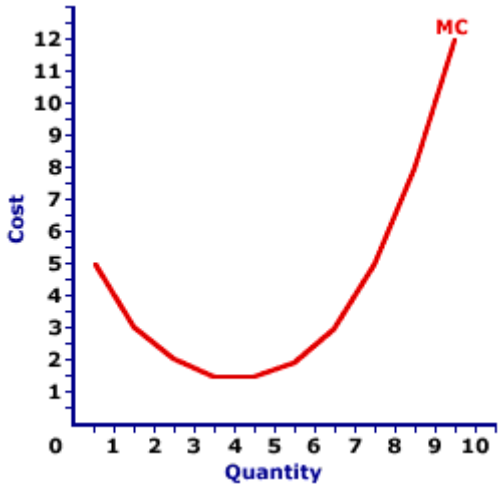
or

$$\frac{\text{Increase in Total Cost}}{\text{Increase in total units}}$$

LET UNDERSTOOD WITH THE HELP OF TABLE:

OUTPUT	TVC	TFC	TC	MC=TCn-TCn-1	MC=TVCn-TVCn-1
0	0	12	12	---	----
1	6	12	18	18-12=6	6-0=6
2	10	12	22	22-18=4	10-6=4
3	15	12	27	27-22=5	15-10=5
4	24	12	36	36-27=9	24-15=9
5	35	12	47	47-36=11	35-24=11

Curve:

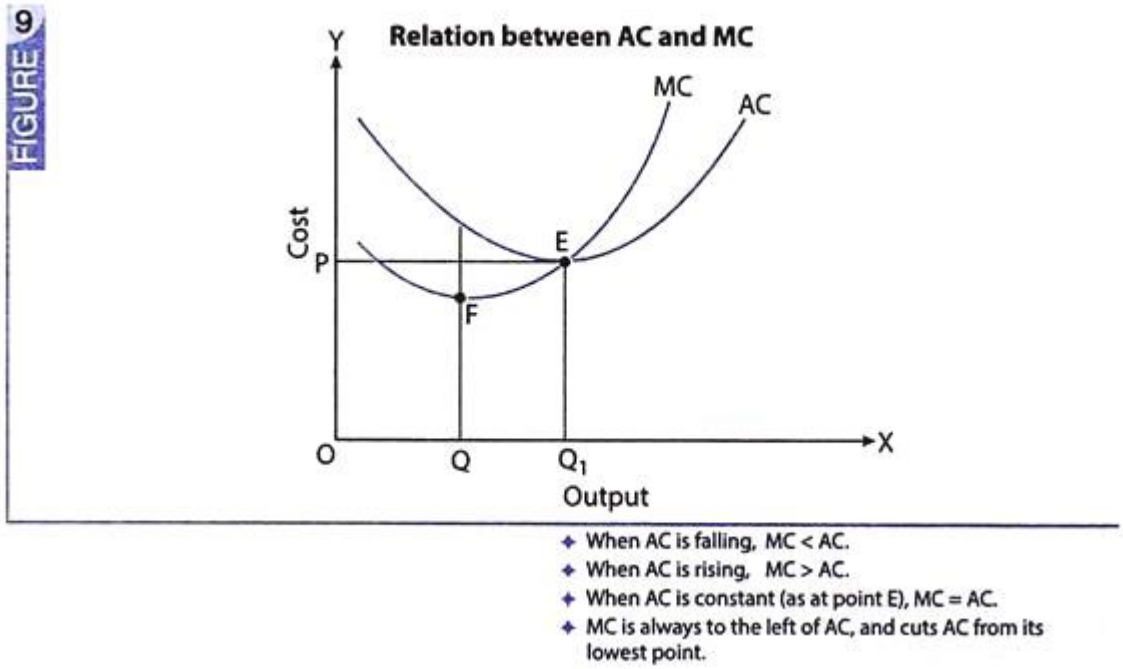


As seen in table, MC can be calculated from both TC and TVC. MC curve is obtained by plotting the points shown in table. MC is U-shaped curve, i.e. MC initially fall till it reaches its minimum point and, thereafter, it starts rising. *The reason behind its u-shape is the law of variable proportions.*

RELATIONSHIP BETWEEN AC AND MC:

OUTPUT	TC	AC	MC	PHASE
0	12	----	----	1(MC<AC)
1	18	18	6	
2	22	11	4	
3	27	9	5	
4	36	9	9	2(MC=AC)
5	47	9.4	11	3(MC>AC)

CURVE:



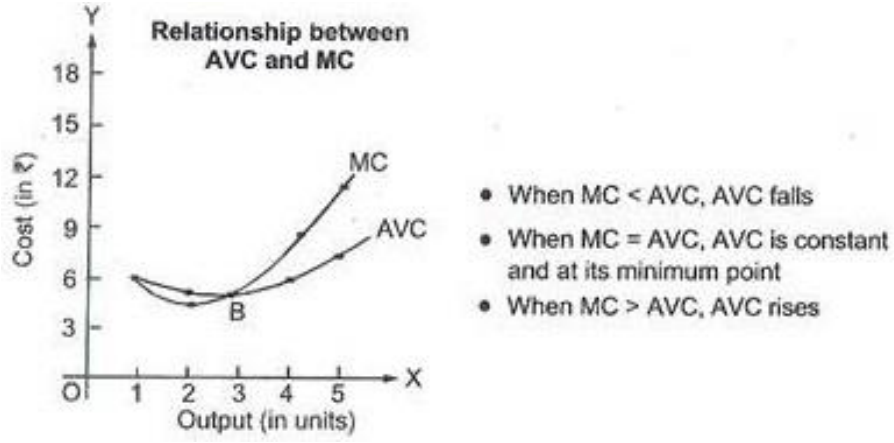
With the help of table and curve, the relationship can be summarized as under:

1. When MC is less than AC, AC falls with increase in the output, i.e. till 3 units of output.
2. When MC is equal to AC , i.e. when MC and AC curves intersect each other at point A,AC is constant and at its minimum points.
3. When MC is more than AC, AC rise with increase in output,i.e. from 5 units of output.
4. Thereafter, both AC and MC rise, but MC increase at a faster rate as compared to AC. AS a result, MC curve is steeper as compared to AC curve.

RELATIONSHIP BETWEEN AVC AND MC:

OUTPUT	TVC	AVC	MC	PHASE
0	0	---	---	**1(MC<AVC)**
1	6	6	6	
2	10	5	4	
3	15	5	5	**2(MC=AC)**
4	24	6	9	**3(MC>AVC)**
5	35	7	11	

CURVE:



With the help of table and curve, the relationship can be summarized as under:

1. When MC is less than AC, AC falls with increase in the output, i.e. till 3 units of output.
2. When MC is equal to AC, i.e. when MC and AC curve intersect each other at point A,AC is constant and at its minimum points.
3. When MC is more than AC, AC rises with increase in output, i.e. from 5 units of output.

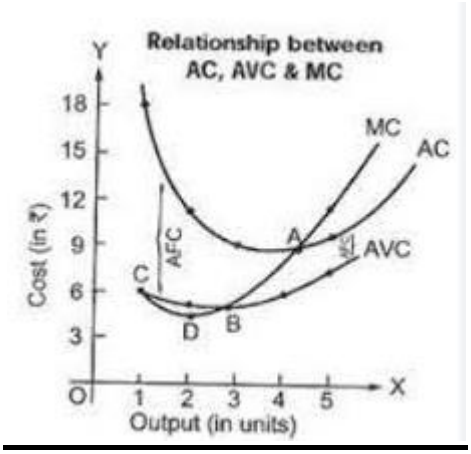
4. Thereafter, both AC and MC rise, but MC increase at a faster rate as compared to AC. As a result, MC curve is steeper as compared to AC curve.

RELATIONSHIP BETWEEN AC,AVC AND MC:

OUTPUT	TVC	AC	AVC	MC
0	0	----	----	----
1	6	18	6	6
2	10	11	5	4
3	15	9	5	5
4	24	9	6	9
5	35	9.40	7	11

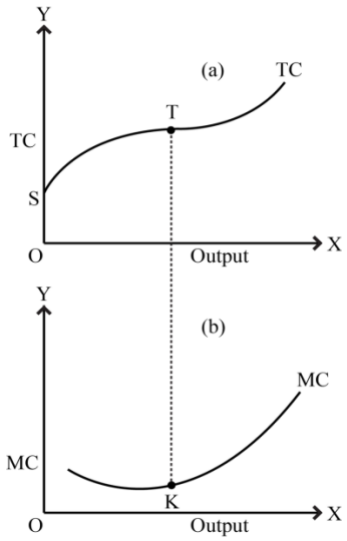
1. When MC is less than AC and AVC, both of them fall with increase in the output.
2. When MC becomes equal to AC and AVC, they become constant. MC curve cuts AC curve (at A) and AVC curve (at B) at their minimum points.
3. When MC is more than AC and AVC, bith rise with increase in output.

RELATIONSHIP BETWEEN AC AND AVC



1. AC is greater than AVC by the amount of AFC
2. The vertical distance between AC and AVC curves continues to fall with increase in output because the
3. Gap between them is AFC, which continues to decline with rise in output.
4. AC and AVC curves never intersect each other as AFC can never be zero.
5. Both AC and AVC curves are U-SHAPED due to the law of variable proportion.
6. MC curve cuts AVC and AC curves at their minimum points
7. The minimum points of AC curve (point A) lie always to the right of the minimum point of AVC curve (point B).

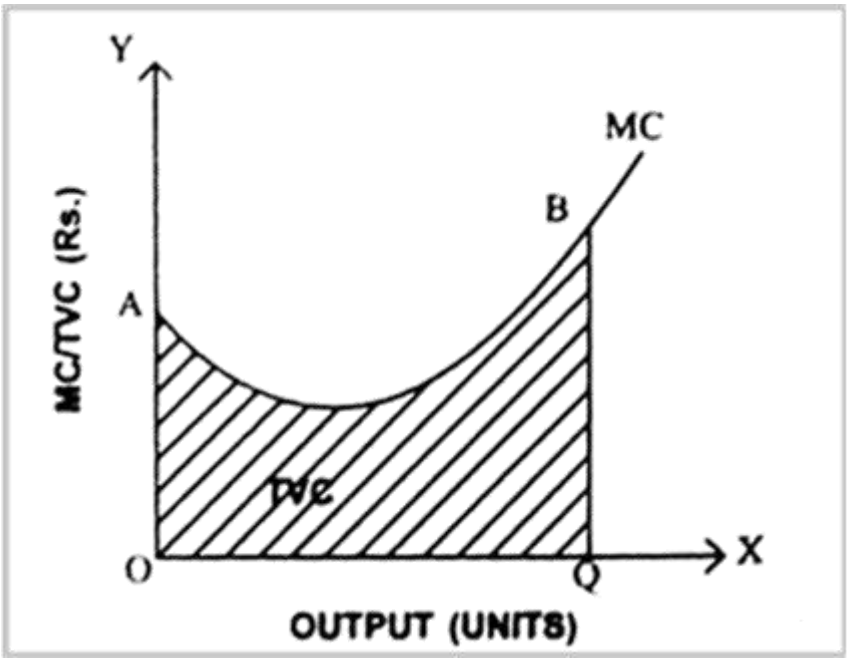
RELATIONSHIP BETWEEN TC AND MC:



1. Marginal cost is the addition to total cost, when one more unit of output is produced. MC is calculated as: MCn=TCn-TCn-1
2. When TC rises at a diminishing rate, MC declines.
3. When the rate of increase in TC stops diminishing, MC is at its minimum point, i.e. point E.
4. When the rate of increase in total cost starts rising, the marginal cost is increasing.

RELATIONSHIP BETWEEN TVC AND MC:

Unit 2: THEORY OF DEMAND



We know, MC is addition to TVC when one more unit of output is produced. So, TVC can be obtained as summation of MV's of all the units produced. If output is assumed to be perfectly divisible, then total area under the MC curve will be equal to TVC.

As seen in the above curve, at OQ level of output, TVC is equal to the shaded area OPLQ in the curve.

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