

Introduction to economics - Themes of economics -  
micro vs macro economics - Demand curves  
and Supply curves - Elasticity of Demand -  
Elasticity of Supply - Demand curves of  
households and firms.

### Introduction to economics.

#### Economic Definition:

- Economics is a study of men as they live and move and think in the normal business of life
- Economics is the study of economic problems of living people in a community.
- Economics is that art and science which studies those activities of social, real and normal human beings, which are related to wealth.
- Economics deals with what everyone is doing every day in ordinary life, that is getting a living. It is a human study, a branch of social science, a study of business activities.

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→ According to Adam Smith (father of economics), "The economics is the science of wealth".

→ According to Alfred Marshall, "Economics is a study of mankind in the ordinary business of life. It examines the part of individual and social action which is most closely connected with the use of the material requisites of well-being."

→ Recent Definitions.

According to Anderson, Shepherd and Juttalaz "Economics is a science of production, exchange and consumption in economic systems".

Importance of Economics for Engineers.

→ Improving and increasing production

→ Reducing human efforts.

→ Increasing wealth.

→ Making the world a more comfortable place to live in.

→ Important place in all engineering decisions.



- Many of decisions which have to be taken concern costs quite as much as performances and items such as interest, depreciations & profits.
- Major role in Industrial Engineering, starting from selection of an adequate plant site to production planning & control, to replacement analysis and to wage structure of workers.

### Concept of Engineering economics.

- Economics is the branch of Social Science that deals with the production and distribution and consumption of goods & services and their management

### Flow of goods

- Households and businesses are the two major entities in a simple economy.
- Business organizations use various economic resources like land, Labour, and capital which are provided by households to produce consumer goods and services which will be used by them.

→ Business organizations make payment of money to the households for receiving various resources.

→ The households in turn make payment of money to business organizations for receiving consumer goods and services.

→ The cycle shows the interdependence between the two major entities in a simple economy

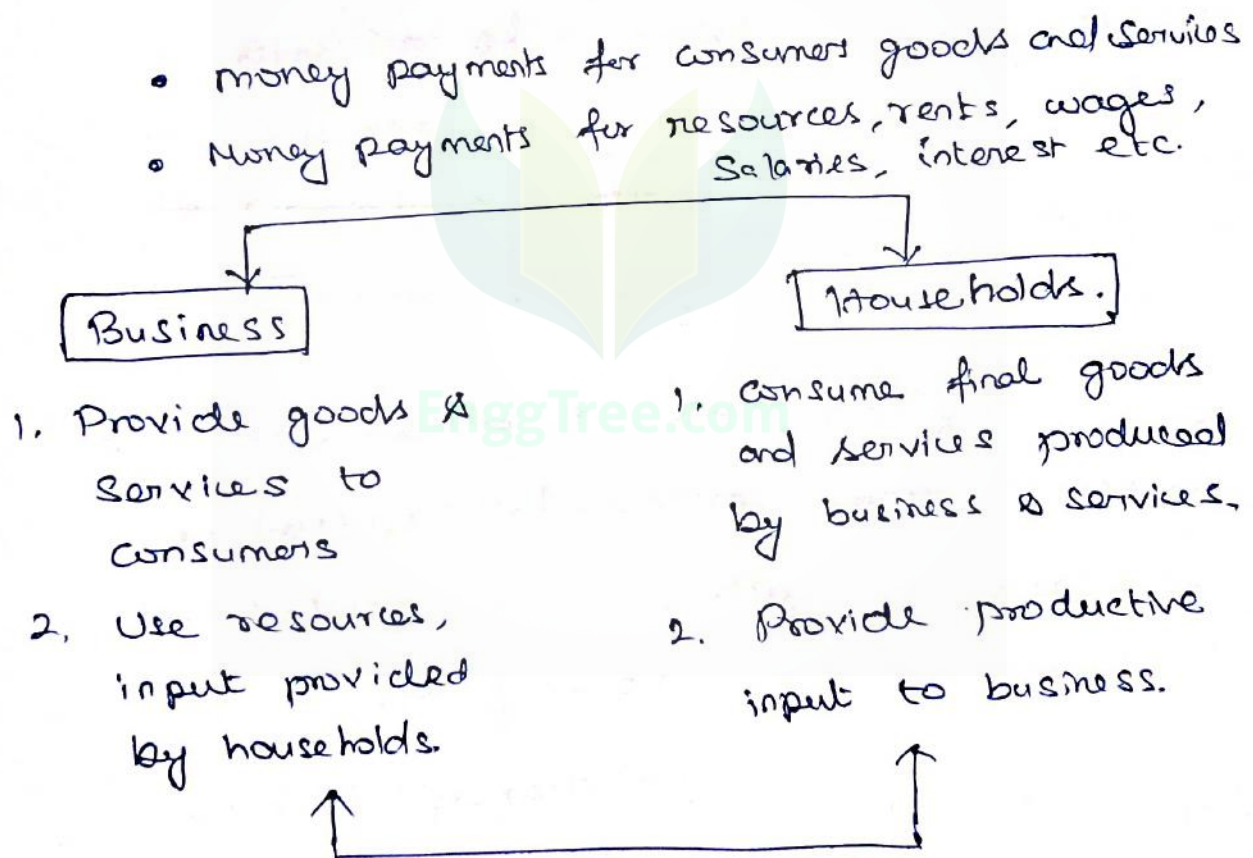


Fig: Flow of goods, services, resources and money payments in a simple economy

## Economics:

- The resources of any economy are limited, the requirements are limitless.
- Economics is the science of learning how to meet the unlimited needs to those limited resources.

## Four Key economic concepts.

- \* Scarcity
- \* Supply
- \* Demand
- \* Cost, Benefit & incentives

## Scarcity:

- Scarcity refers to a basic economic problem that refers gap between limited resources and theoretically limitless wants.
- This situation requires people to make decisions about how to allocate resources efficiently.
- Scarcity is when the means to fulfil ends are limited and costly
- Even free, <sup>natural</sup> resources can become scarce if cost arise (or) consuming more.



## Supply and Demand

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- A market system is driven by supply and demand.
- Taking the example of cool drinks, if many people want to buy cool drink, the demand for cool drink is considered high. As a result, cool-drinks seller make more money on average by using sugar to make cool-drinks.
- Hypothetically, this could lead to a situation where more people start making cool-drinks and after few production cycles, ~~there~~ there is so much cool-drinks on market. The supply of cool-drinks are increased. Then, the price of cool drinks drops.

## Cost and Benefits:

- The concept of cost and benefit is related to the theory of rational choice.
- The people behave rationally, it represents, people try to maximize the ratio of benefits to cost in their decisions.
- ~~It~~ In other words, the customer will buy the best product, they can afford to purchase.

→ An economic incentive system uses material and financial rewards to motivate individual to increase productivity.

→ A typical example is a payroll (monthly salary), which motivates workers to show-up and perform their duties.

→ Five common examples

\* Tax incentives.

\* Subsidies.

\* Financial incentives

\* Tax rebates - It is a refund process.

\* Negative incentives - It refers the mechanisms designed to discourage activities that are harmful to biodiversity.

→ Economic incentives explain how the operations of supply and demand encourage producers to supply the goods that consumer want, and consumers to conserve on scarce resources.



→ Economic problem is the problem of choice involving satisfaction of unlimited wants out of limited resources having alternative uses.

→ Root cause of all economic problem is 'Scarcity'

→ Scarcity in economics refers to the limitation of supply of a good in relation to its demand.

### Reasons for economic problems

- \* Scarcity of resources
- \* Unlimited human wants.
- \* Alternative use of resources

### Scarcity of resources:

→ The Supply of resources (ie) Land, labour, capital etc. are limited in relation to their demand and the economy cannot produce what people want.

→ The available resources are limited quantities in every economy.

→ No economy in the world is rich in all resources



- Human wants never ending. (ie) They can never be fully satisfied.
- As soon as one want is satisfied, another new want emerges.
- Wants of people are unlimited and keep on multiplying and cannot be satisfied due to limited resources.
- Hence, people allocate their resources in order of preference to satisfy some of their wants.

Alternative use of resources

- Resources are not only scarce, but they can also be put to various uses.
- For example: Land can be used for farming, setting up a factory or a school etc. for another use.
- If one resource can be put to only one use, there would be no problem of choice (or) alternative.

## Central problem of an Economy:

→ "problem of resource allocation would not arise, if resources do not have alternative uses".

→ If a resource can be put only to a specific use, then the problem of resource allocation would not arise.

→ The central problem faced by an economy can be categorized under three heads;

- ✗ what to produce and in what Qty
- ✗ How to produce
- ✗ For whom to produce.

### 1. What to produce and in what quantities

→ This problem involves selection of goods and services to be produced and the quantity to be produced of each selected commodity.

→ For Example: Production of more cars is possible only by reducing the production of other goods using similar resources.

→ After deciding the goods to be produced, the economy has to decide the quantity of each commodity that is selected.



## II. How to produce (Choice of technique of production)

→ A good can be produced using different techniques of production depending on the availability of resources.

Technique by Labour intensive

→ The technique which uses more labour and less capital (machines) is labour intensive technique.

Technique by capital intensive

→ The technique which uses more capital and less labour is capital intensive technique.

## III. For whom to produce

→ This problem relates to the distribution of produced goods and services among the individuals within the economy.

→ In other words, the selection of the category of people who will ultimately consume the good.

→ Goods are produced for those people who have paying capacity.

→ The capacity of people to pay for goods depending upon their level of income



1. Economic System.

- Similarities and differences in economic systems.
- Traditional, command & market economics.
- Expansion, Recession & Depression in the economy

2. Scarcity, choice & Decision making

- Scarcity & limited resources.
- Allocation of resources
- Incentives.
- Opportunity cost
- Decision making.

3. Work, earning & Financial management

- Factors influencing wages.
- Labour productivity
- Profit & losses.

→ Entrepreneurship

→ Cost & benefits & Savings

→ Impact of interest rates.

4. Business and entrepreneurship

## 5. Economic interdependence.

- Specialization
- Trade
- Geographic patterns of economic activities
- Global production and consumption of goods or services.

## 6. Markets and the government functions.

- Market transactions.
- Exchange rates.
- Benefits of Taxation
- Sources of tax revenue
- changes in supply & Demand.

## Microeconomics.

→ micro economics is a branch of economics that studies the behaviour of individual units such as households, individual, & enterprises within the economy.

### Components of microeconomy

- Consumer demand
- Production
- Cost of production
- Opportunity cost

→ Macro economics is the study of whole economies - the part of economics concerned with large-scale or general economic factors and how interact in economies

→ macroeconomics focuses on the performance of economies - change in economic output, inflation, interest and foreign exchange rates and balance payments.

→ Macro economics focuses on three things.

- National output
- Unemployment
- Inflation

Difference between microeconomics and macro economics

(see the table)



Point of difference	Micro economics	Macro economics.
1) Nature	It studies the behaviour of individual consumers, firms & the owners who supply factor inputs.	It studies the behaviour of economy as a whole.
2) coverage	Individual unit such as individual and firms	It covers aggregates of individuals, firms in the economy as a whole.
3) Parameters used	<ul style="list-style-type: none"> <li>→ Individual &amp; market demand</li> <li>→ market supply</li> <li>→ Production function</li> <li>→ Prices of commodities</li> <li>→ employments.</li> </ul>	<ul style="list-style-type: none"> <li>→ National income</li> <li>→ Inflation &amp; unemployment</li> <li>→ Banking</li> <li>→ Policies.</li> <li>→ economic growth.</li> </ul>
4) Policy formation	At the firm level	At the level of nation or state
5) Relationship	Individual & firms are affected by macro-economic policies.	There can not be macro without micro economics.

- Demand is one of the crucial requirements for the existence of any business enterprise
- A firm is interested in its own profit and /or sales, both of which depends partially upon the demand for its product
- The larger the demand for a firm's product, the larger / higher is the price it can charge, other things remaining the same.

Example:

→ To say that demand for an ambassador car in India is 40,000 is not meaningful unless it is stated that this was the demand in 1976 when an Ambassador car's price was around 30,000 rupees, competing cars' prices were around the same, A Bajaj scooter's company price was around 5,000 rupees and petrol price was around 3.5 rupees per litre.

→ In 1977, the demand for Ambassador cars could be different if any of the above factors happened to be different.



## Types of Demand; EnggTree.com

- There is no single concept of demand
- Furthermore, the determinants of demand as well as their relative importance vary with the category of good and level of aggregation.

- (a) Demand for customers' goods & producers' goods
- (b) Demand for perishable and durable goods
- (c) Derived and autonomous demand
- (d) Firm and industry demands
- (e) Demands by total market and by market segments.

### (a) Customers' goods and producers' Goods demand

→ Customer's goods are goods used for final consumption. Ex: Food items, ready made clothes, houses.

→ Producers' goods are used for production of other goods, customers' or producers'.  
Ex: Machines, tools, raw-materials.

→ Demand for customers' goods is also termed as direct demand, for these goods are used directly for final consumption.

→ Demand for producers' goods is derived demand, for these goods are demanded



not for final consumption but for the production of other goods.

(b) Perishable and durable goods' demand.

→ Both consumers' and producers' goods are further divided into perishable (non-durable) and durable goods.

→ Perishable goods are those which can be consumed only once, while durable goods are those which can be used more than once over a period of time

→ Perishable good Example: Sweets, bread & milk  
(non-durable) → Coal, oil, raw materials

→ Durable consumers' goods Example;  
→ Furniture, refrigerator, car, etc

(c) Derived and autonomous demand.

→ When the demand for a product is tied to the purchase of some parent product, its demand is called derived.

→ Example: the demand for cement is a derived demand, for it is needed not for its own sake but for satisfying the demand for buildings.

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→ Autonomous demand, on the other hand, is not derived. It is hard to find a product today whose demand is wholly independent of all other demands. However, the degree of this dependence varies widely from product to product.

→ For example: The demand for autonomous automotive batteries is fully tied up with the demands of vehicles using these batteries, while the demand for sugar is loosely tied up with the demand for drinks.

(d) Company and Industry demands.

→ company demand denotes the demand for the products of a particular company while industry demand means the demand for the product of a particular industry.

→ For example: the demand for steel produced by Tata Iron and Steel Company (TISCO) is a company demand while demand for steel produced by all companies in India is Industry demand for ~~steels~~ steel in India.

→ All industry comprises all the firms



of companies producing similar products which are close substitutes to each other irrespective of different in brand names.

(e) Demand by Total market and by Market Segments.

→ The former refers to the total demand for a product whereas the latter signifies demands arising from different segments of the market.

→ A company or an industry may be interested not only in the total demand for its products but also in the demand for its products arising from different segments of the market,

→ For example, from different regions, different uses for its product, different distribution channels, different customers size, and also for its different sub-products.

→ Each of these segments may differ significantly with respect to ~~cost~~ delivered prices, net profit margins, competition, seasonal patterns etc.



## Determinants of Demand

→ Goods and services are demanded by consumers.

→ Consumers' goods are needed for final consumption while producers' goods are needed for production of goods and services.

→ A consumer's demand for a commodity or service depends on several factors,

- (a) Consumer's income.
- (b) own price or Demand (Law of Demand).
- (c) Prices of related goods & Demand.
- (d) Population and its distribution & Demand.
- (e) Expectations and Demand.

### (a) Consumer's Income and Demand

→ It acts as constraint variable in demand functions.

→ As a consumer becomes richer and richer, they consume more and more of essential goods and services. ~~rather~~

→ Once a customer or consumer is satisfied quantitatively, they spend their increased income to improve their consumption qualitatively.

→ Thus, as income increases, the demand for good quality products increases while that of poor goods and services decreases.

→ A hypothetical income - demand schedule and its corresponding income - demand curve called Engel curve for a normal commodity.

Table. Engel schedule

Income (Rs.) - I	Demand for X - ( $D_x$ ) units
100	10
200	16
300	21
400	25
500	27

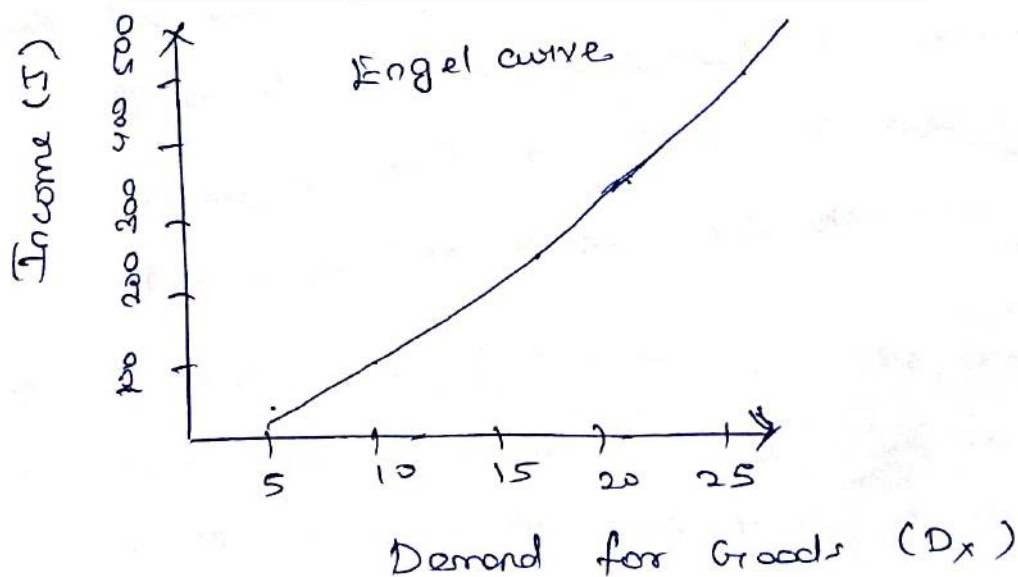


Fig. Engel Curve

(b) Own Price and Demand (Law of Demand)

→ The demand for a goods varies inversely with its own price.

→ If the price of commodity  $X$  falls, the demand for that commodity raises and Vice versa. This with ceteris paribus assumption is call the Law of demand.

→ It can be illustrated with reference to the behaviour of buyers.

→ An 'inferior good' is one whose demand drops when people's income rises. Inferior goods are the opposite of normal goods.

→ The inferior goods whose demand varies directly with their prices are called 'Giffen's goods'.

→ The Law of demand presented in the form of a table is called the demand Schedule and the same in the form of a graph is known as demand curve.

→ In other words of Marshall, "The amount demanded increases with a fall in price and diminishes with a rise in price."



Table: Demand Schedule.

Price of goods (Rs)	Demand for Commodity (units)
8	50
7	55
6	60
5	70
4	80
3	90
2	100

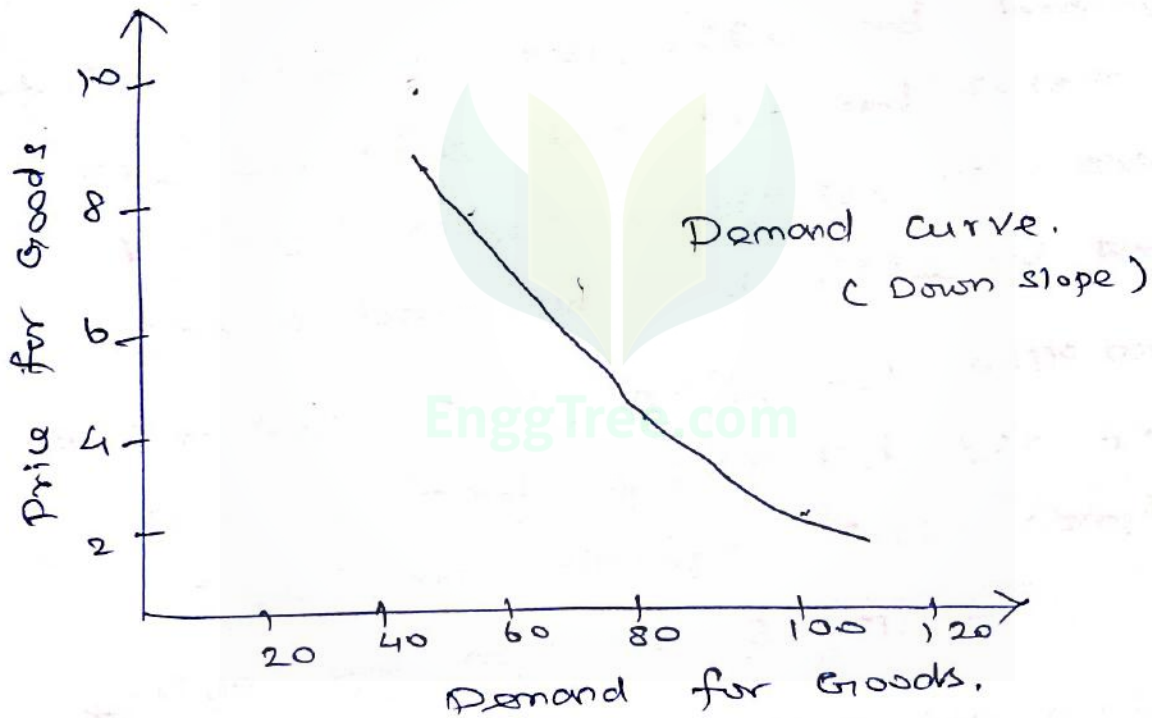


Fig: Demand Curve

→ Exceptions to the law of demand may arise even for non-Giffen's goods under following situations

- (a) when the good in question is a luxury item
- (b) when the good whose demand is being studied goes out of fashion
- (c) when prices fall, people expect it to fall further and vice-versa

## (c) Price of related goods & Demand

- Goods and services have two kinds of relationship: (a) complementary goods (b) Substitute goods.
- A Good may be a substitute for some other good, it may be complementary to some other good, (or) it may have no relationship with some good.
- Furthermore, the degree of this relationship may vary from commodity to commodity.
- For example, tea, coffee and brownie are substitutes but tea and coffee are perhaps closer substitutes than tea & brownie, and coffee and brownie.
- Similarly, tea, sugar and milk are complementary goods but tea and sugar are perhaps closer complements than milk and sugar.
- Thus, when the price of a commodity, say 'X' falls, other prices remaining constant, the demand for 'X' goes up.
- In the new situation, commodity 'X' is relatively cheaper than its substitutes and so the consumers will buy more of 'X' and less of ~~the~~



it's Substitute good, when more of 'X' is purchased due to a fall in its price, consumers need more of goods which are complementary to good 'X'.

→ Thus, as the price of a good falls, the demand for its substitute good falls, and vice versa.

→ Hence, the demand for a good varies inversely with the prices of its complementary goods.

#### (d) Population and its Distribution and Demand

→ Demand for a product depends positively upon the number of consumers, which varies directly with the size of population.

→ Furthermore, the spread of consumers over regions, and urban-rural areas, etc.

→ For example; People take more of coffee and rice in the South Indian than in the north of India.

→ The demand for cosmetics is more from women than from men.



## (e) Expectation Demand:

- The demand for durable goods and for the non-durable goods which can be stored for some time periods also depends upon consumers' expectations about their prices and availability.
- If consumers expect the price to fall in the future, their current demand will be less & vice versa.
- Similarly, if consumers expect shortage of a commodity in the future, they will demand more of it now for two reasons:
- The commodity may not be available in the future.
  - Its price may be higher in the future than now.

## Demand function:

- A demand function states the dependence relationship between the demand for a commodity (or) service and the factors or variables affecting it. Thus, the demand function for commodity 'X' can symbolically be stated as follows.

$$D_x = f(I, P_x, P_s, P_c, T, u).$$

$I$  - consumers' income

$P_x$  = Price of  $x$

$P_s$  - Price of substitutes of  $x$

$P_c$  - Price of complements of  $x$

$T$  - consumers' tastes & preferences,

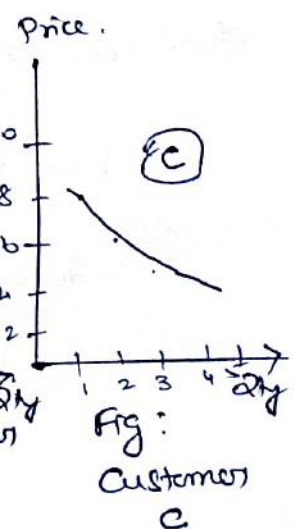
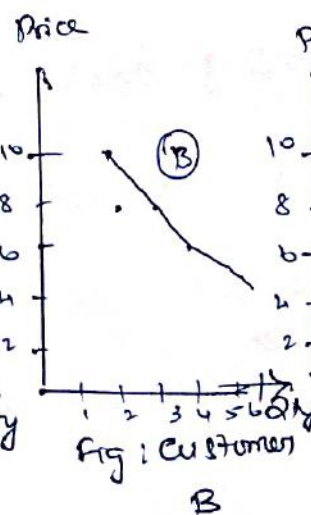
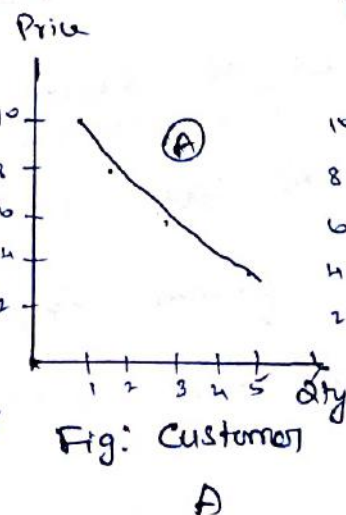
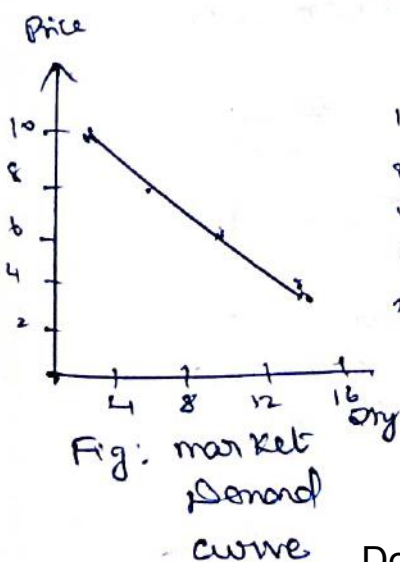
$u$  - other determinants of demand for  $x$

### Market demand curve:

→ market demand refers to the total demand for a commodity by all the consumers.

Table : Market demand schedule.

Price	Demand by customers			market Demand
	A	B	C	
10	1	2	0	3
8	2	3	1	6
6	3	4	2	9
4	5	6	4	15



→ When the price of apples is Rs. 10, A buys one apple and B buys 2 apples and so on.

→ When price falls to Rs. 8, A buys 2 apples B buys 3 apples and so on.

→ By adding up the quantity demanded by all three at various prices, we get market demand curve

→ The market demand curve is obtained by adding together the demand curves of individual households in an economy.

→ As the price increases, household demand decreases, so market demand decreases [downward sloping].

→ In other words, when income increases, the demand curve for an inferior good shifts to the left [It represents lack of interest on buyers side].  
The buyer moving to buy branded materials since increased revenue.



## Elasticity of Demand

- Law of Demand explains the direction of change in demand. A fall in price lead to an increase in quantity demanded and vice versa.
- But, it does not tell us the rate at which demand changes to a change in price.
- Elasticity of demand explains the relationship between a change in price and consequent change in amount demanded.
- In other words of Marshall, "The elasticity of demand in a market is great or small according as the amount demanded increase much or little for a given fall in the price and diminishes much or little for a given rise in price."

### Elasticity of Demand

Elastic Demand	In-Elastic Demand
A small change in price may lead to great change in quantity demanded	If a big change in price is followed by a small change in

### Example for elastic demand

Price in (Rs)	Quantity Demand of milk (in Litres)
5.0	1.0
4.75	2.0
5.25	0.5

[A small change in price lead to ~~great~~ great change in quantity demand]

### Example for In - elastic demand

Price in (Rs)	Quantity Demanded of rice (in Kg).
15	25
10	30
20	20

[When the price of rice has changed to a great extent the quantity demanded of rice has changed by a very small amount].

### Types of Elasticity of Demand.

- Price elasticity demand
- Income elasticity demand
- cross - elasticity demand

## Price Elasticity Demand

Marshall words, "Price elasticity of demand measures changes in quantity demanded to a change in price".

$$\text{Price elasticity} = \frac{\text{Proportionate change in quantity demanded}}{\text{Proportionate change in price.}}$$

## Income Elasticity of Demand

$$\text{Income elasticity of Demand} = \frac{\text{Percentage change in quantity demand}}{\text{Percentage change in income.}}$$

$$e_i = \frac{(D_1 - D_0) / (D_1 + D_0)}{(I_1 - I_0) / (I_1 + I_0)}$$

Formula for price elasticity demand,

$$e_p = \frac{(Q_{\text{final}} - Q_{\text{initial}}) / (Q_{\text{final}} + Q_{\text{initial}})}{(P_{\text{final}} - P_{\text{initial}}) / (P_{\text{final}} + P_{\text{initial}})}$$



Example: ① Elastic Demand

$$\text{Price-1} = \$10, \quad \text{Price-2} = \$8$$

$$\text{Qty-1} = 30 \text{ nos}, \quad \text{Qty-2} = 60 \text{ nos.}$$

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

$$= \frac{(60 - 30) / (60 + 30)}{(10 - 8) / (10 + 8)}$$

$$= \frac{20 / 80}{2 / 18}$$

$$= 3.0 \quad \text{The elasticity coefficient is } \underline{\underline{3}}$$

Example ② In elastic Demand,

$$\text{Price-1} = \$12; \quad \text{Price-2} = \$6$$

$$\text{Qty-1} = 40; \quad \text{Qty-2} = 50.$$

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

$$= \frac{(50 - 40) / (50 + 40)}{(12 - 6) / (12 + 6)}$$

$$= \frac{10 / 90}{6 / 18}$$

$$= 0.33 \quad (\text{In-elastic demand})$$

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cross elasticity of Demand,

$$\frac{\left[ \frac{\text{Proportionate change in Quantity}}{\text{Original quantity}} \right]}{e_c = \frac{\left[ \frac{\text{change in price}}{\text{original price}} \right]}$$

$$e_c = \frac{\left[ \frac{\Delta Q}{Q} \right]}{\left[ \frac{\Delta P}{P} \right]} = \frac{P}{Q} \times \frac{\Delta Q}{\Delta P}$$

P, Q - Original price / Quantity  
 $\Delta P, \Delta Q$  - Change in price / Quantity

Measurement of elasticity.

1. Percentage method,
2. Total outlay method

1. Percentage method,

$$E_d = \frac{\text{Relative change in the amount demanded}}{\text{Relative change in price.}}$$

→ By comparing the ratio of percentage of change in the amount demanded to the percentage of change in the price of a commodity.

## 2. Total Outlay Method, EnggTree.com,

→ In this method we consider the change in expenditure on commodities due to change in price.

→ If a given change in price does not cause any change in the total amount of money spent on commodity, then elasticity of demand is equal to unity

Table: Demand schedule showing unit elasticity

Price in Rs	Quantity Demanded	Total Outlay
4.00	4.5	Rs. 18
3.00	6.0	Rs. 18
2.00	9.0	Rs. 18

→ As price falls, quantity demanded increases; But the total outlay (or) Expenditure ~~is~~ remains constant

→ If total expenditure increases due to fall in price, elasticity of demand greater than unity

Price	Quantity Demanded	Total Qty
4.50	6	Rs. 27
4.00	7	Rs. 28
3.00	9	Rs. 30



→ If a change in price results in fall in the amount spent, then elasticity of demand is less than unity

Price (Rs)	Quantity Demanded	Total Qty
4.50	4.00	Rs. 18
4.00	4.25	Rs. 17
3.00	5.00	Rs. 15

→ Here the total outlay is declining even though quantity demanded is increasing. Hence demand is said to be inelastic and elasticity coefficient is less than one

### Supply:

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→ Supply means the commodity offered for sale at a price. Supply is the willingness and ability of producers to produce for sale various amounts of good and services at each specific price during a specified period of time

## Law of Supply EnggTree.com

→ The Law of Supply states that quantity supplied is positively related to rise

→ Firms offers smaller amount for sale per time period at lower prices and larger amount at higher prices in search of greater profits. Thus the supply has functional relationship with price.

Table : Supply Schedule of product A

Price per kg in Rs	Quantity supplied in kg
15	18
12	16
9	12
6	7
3	0

→ It can be seen that when price is as high as Rs. 15 per kg, as many as 18 kg of product 'A' are offered for sale.

→ As price falls, the amount supplied decreases. When the price is as low as Rs. 3 per kg nothing is offered for sale.

→ This means that a price falls supply is contracted and as price rises supply is extended



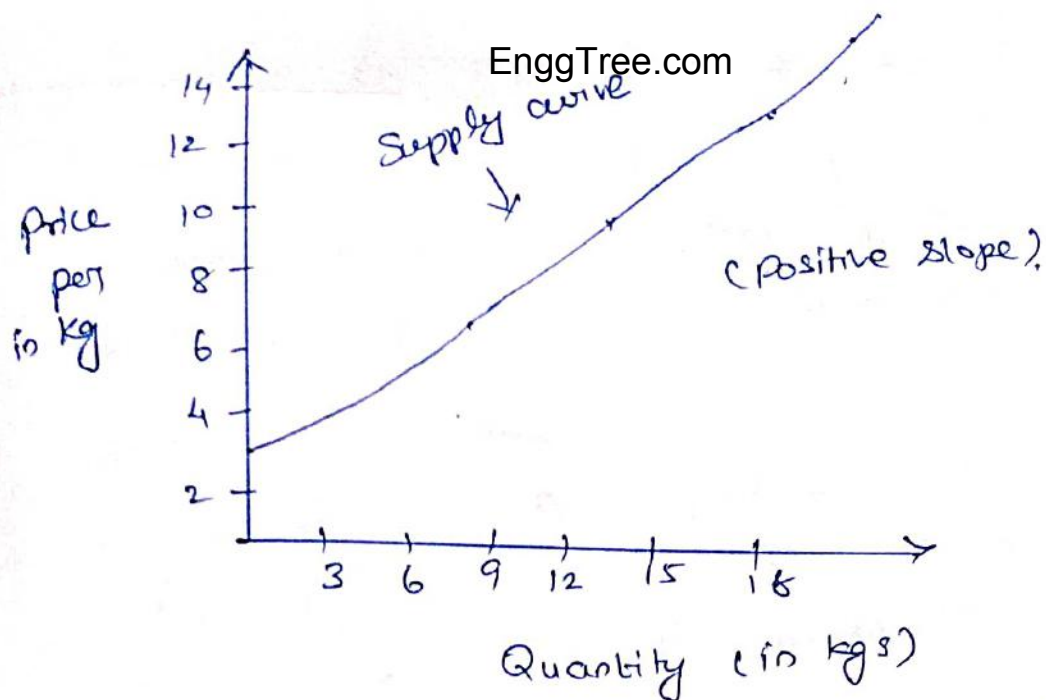


Fig: Supply curve for product A.

### Market Supply Curve:

→ It is the sum of the separate supply curves of all the producers in a market

Table: Market Supply schedule of product 'A'

Firm 'A's' Supply for Product 'A'		Firm B's Supply for Product 'A'		Market Supply for product 'A'	
Price	Qty	Price	Qty	Price	Qty.
0	0	0	0	0	0
4	0	4	2	4	2
8	6	8	4	8	10
12	12	12	6	12	18
16	18	16	8	16	26
20	24	20	10	20	34.

→ If firm 'A' and firm 'B' are the only firms producing Product A, the market supply curve is the sum of the amounts each would offer at each possible price.

→ At Rs. 8 firm A, supplied 6 units and firm B supplied 4 units, the total quantity supplied at price is 10 units.

→ When price rises to Rs. 20, firm 'A' offers 24 units and firm 'B' supplies 10 units. The market supply of 34 units is the result of adding together the amounts supplied by two firms.

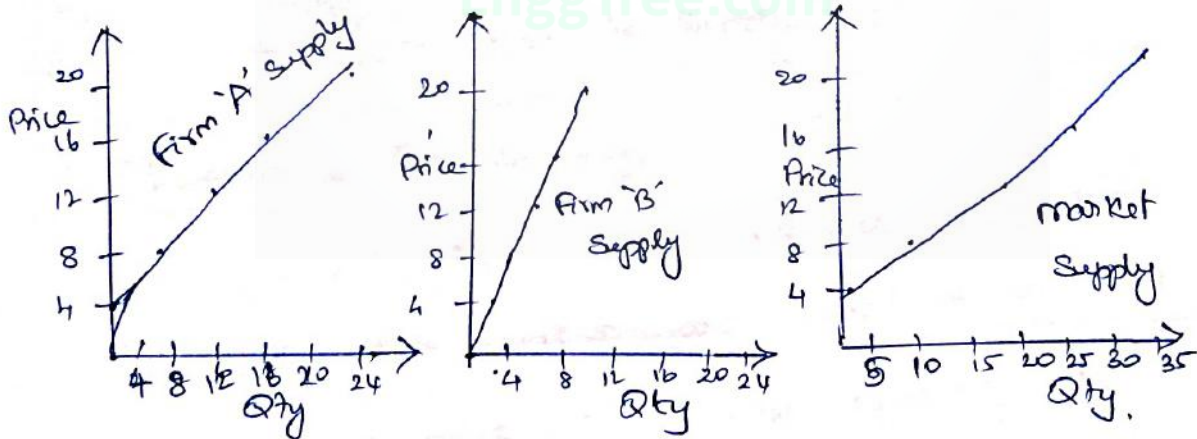


Fig: Market Supply curves.

→ At higher prices, firms A and B increase their supply of product 'A'

→ Market Supply curve is the sum of separate curves of firm 'A' and firm 'B'.

## Certain exceptions to the law of Supply

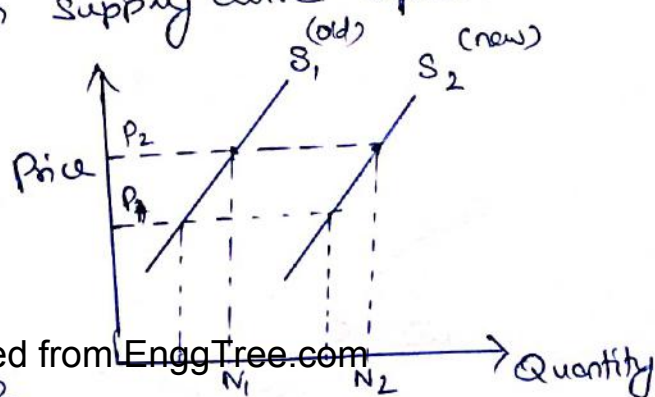
- when prices are expected to fall much, Sellers will sell more in order to clear their stocks in the short run.
- Over the long run, Supply is influenced by changes in cost & in technology.
- changes in habits, tastes, fashions, weather, national & international disturbances also influence the supply of commodities.

## Changes in Supply

- Increase in Supply
- Decrease in Supply
- Extension in Supply
- Contraction in Supply

## Increase in Supply

- Increase in Supply is a situation when more units are supplied at the same price (or) same quantity is supplied at a lower price. This is shown by a shift in supply curve upwards to the right side.





## Decrease in Supply EnggTree.com

→ Decrease in Supply shows that less units of the commodity are supplied at the same price (or) the same quantity is supplied at a higher price.

→ With decrease in supply, the supply curve get shifted upwards to the left

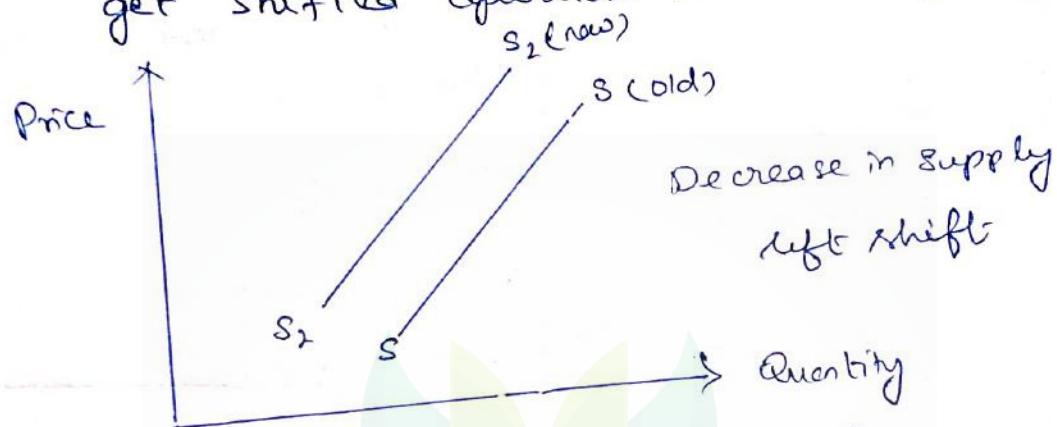
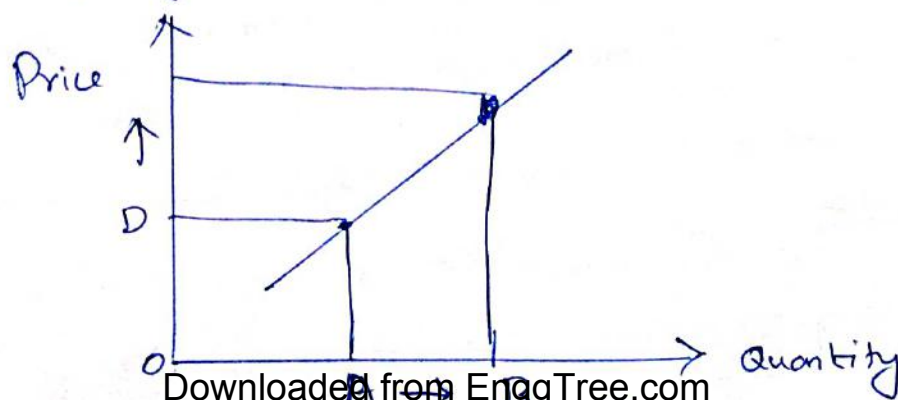


Fig: Decrease in Supply

## Extension in Supply:

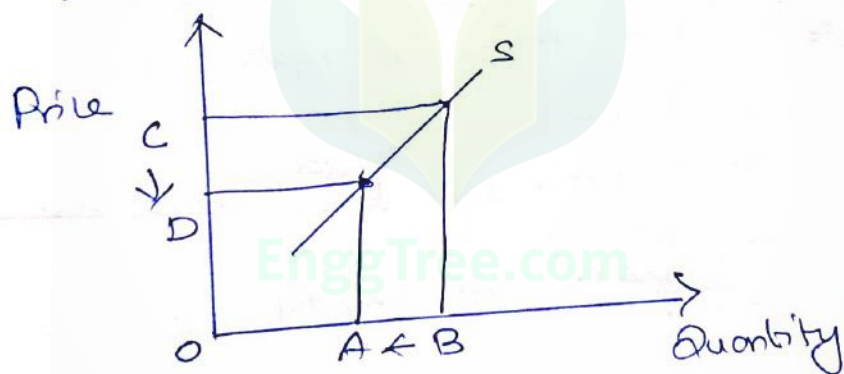
→ In this situation, where more units are supplied at higher price.

→ When the price is  $OD$ ,  $OA$  units are supplied. Suppose the price rises from  $OD$  to  $OC$ , the producers would supply  $OB$  units of commodity.



## Contraction in Supply

- It refers to a condition, where less units of the commodity are supplied at a lower price.
- Originally the price of the commodity is  $OC$  and quantity supplied is  $OB$ . When the price falls from  $OC$  to  $OD$ , only  $OA$  quantity is supplied. It means with the fall in price of commodity, supply has contracted from  $OB$  to  $OA$ .



## Elasticity of Supply

- The law of Supply does not tell us how much the quantity supplied changes in response to a change in price.
- This information as to how much or to what extent the quantity supplied of a good will change as a result of a change in the price is explained by the concept of elasticity of supply.



→ Elasticity of Supply is the degree of responsiveness of change in supply to change in price on the part of sellers

$$E_s = \frac{\text{Proportionate change in quantity supplied}}{\text{Proportionate change in price}}$$

$$= \frac{\left[ \frac{\Delta q}{q} \right]}{\left[ \frac{\Delta P}{P} \right]}$$

### Factors affecting Supply

→ Supply depends on the price. As the price rises, sellers like to sell more and more, and vice versa

→ Cost of production may rise due to increase in the cost of variable factors. This will result in a decrease in supply.

→ Any change in price of other / similar products influence the supply

→ The change in technology affects the supply function.

→ Imposition of taxes by Govt. will reduce the supply



## Determinants of Supply

- \* Price of the product
- \* Non-price determinants

### Price of the product

- Economic stress the importance of price in determining how much will be produced.
- We assumed ~~that~~ that supply curve is constant curve if there ~~are~~ no new technological discoveries, price of the resource stayed same, & no change in taxes etc.

### Non-price determinants:

- It is based on following parameters;

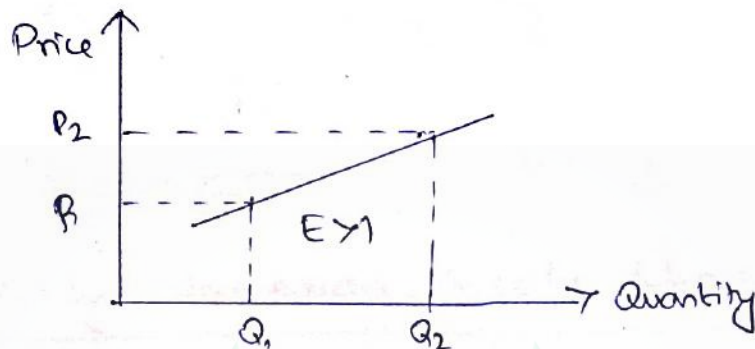
- \*  $P_e$  - Expected price
- \*  $P_{og}$  - Price of other Goods [Produced by other firm]
- \*  $P_{res}$  - Price of resource
- \*  $T$  - Technology
- \*  $t$  - Tax & subsidies
- \*  $n$  - no. of products.

## Elasticity of Supply Types.

→ Elastic Supply ( $E_s > 1$ ).

→ Supply is said to be elastic when a given percentage change in price leads to a larger change in quantity supplied.

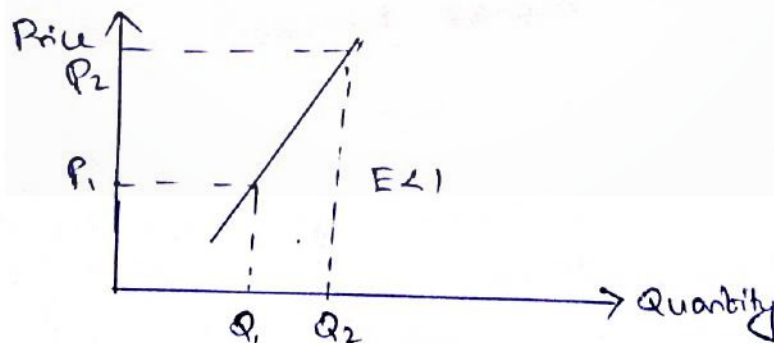
→ It will be greater than one



In - Elastic Supply : ( $E_s < 1$ ).

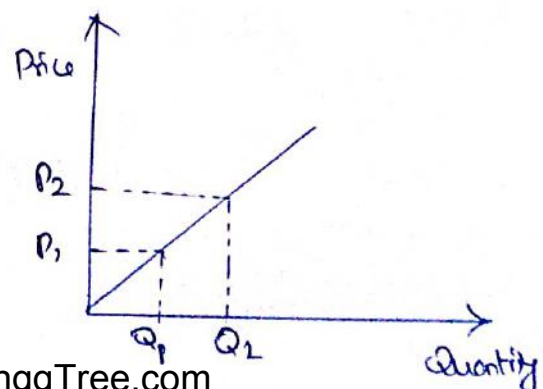
→ Change in price causes a smaller change in quantity supplied.

→ It will be less than one



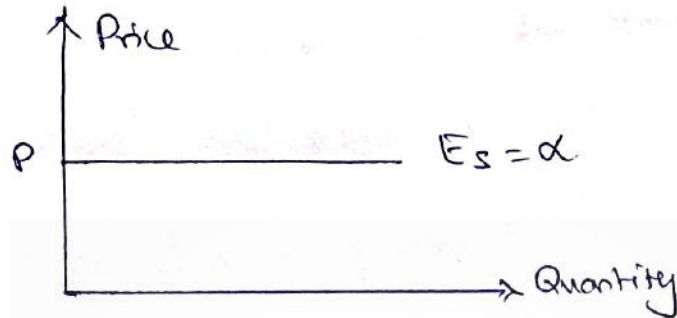
Unit Elastic Supply ( $E = 1$ )

→ The price and quantity supplied change by the same magnitude.



## Perfectly Elastic Supply ( $E_s = \infty$ )

→ The supply curve is that unlimited quantity will be offered for sale at the price constant or slightly drop. ~~the sale nothing will happen~~

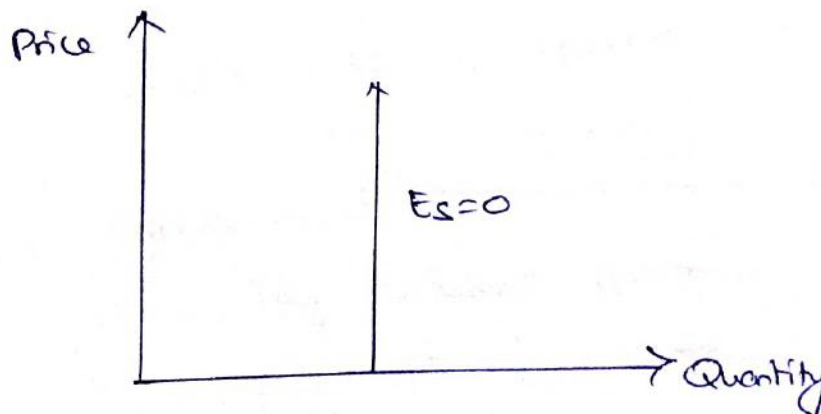


## Perfectly In-elastic supply ( $E_s = 0$ ).

→ In other words, we can say zero elastic supply

→ What ever the price of commodity changes, the quantity remains unchanged.

→ Quantity supplied remains same.





## Determinants of Elasticity of Supply:

### \* Nature of goods:

- In the context of supply, substitute goods are those to which factors of production can most easily be transferred.
- Durable goods can be stored for a long time, its elasticity of supply is high.
- Non-Durable goods, & perishable goods elasticity of supply tends to be very low.

### \* Time :

- Time also exerts considerable influence on the elasticity of supply.
- Manufacturing Industries can usually adjust their output upward or downward fairly quickly in response to changing condition in the market.
- Agricultural commodities - The natural time lag between planting and harvesting of crops. The production plan have to be made months or even years ahead.

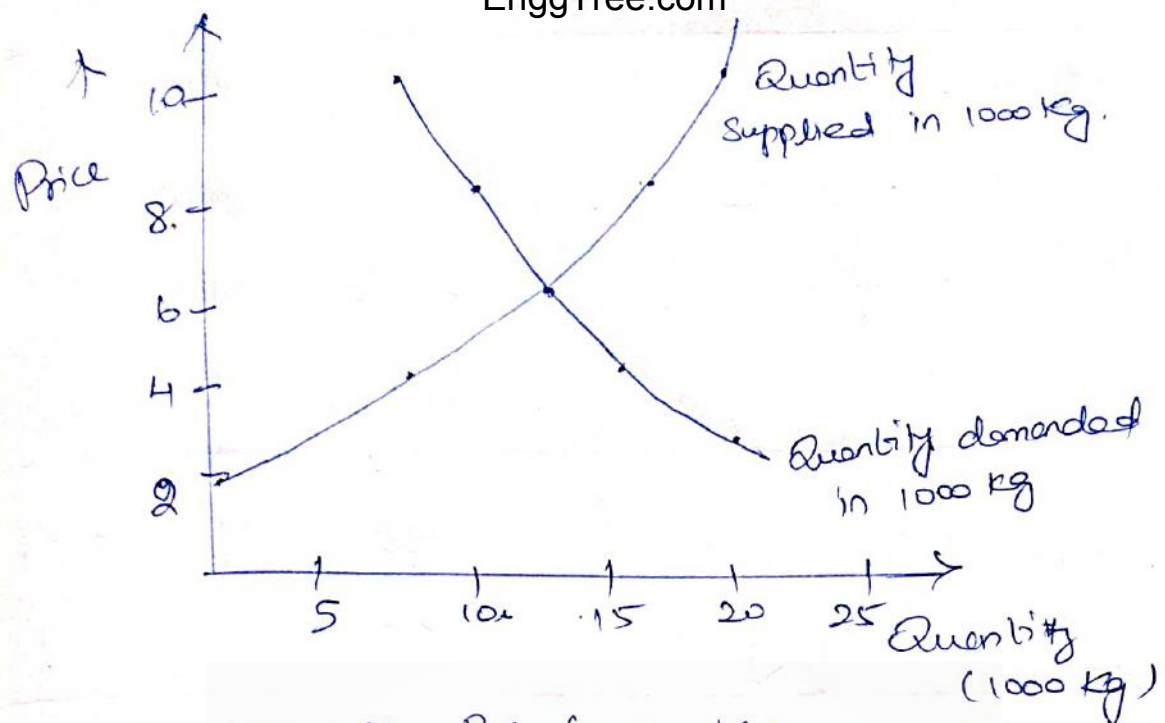
## Supply, Demand and market equilibrium

→ A market is in equilibrium at that price at which the amount producers want to supply exactly matches the amount

Price	Quantity demanded in 1000 kg	Quantity supplied in 1000 kg	Pressure on price
10	9	18	Falling
8	10	16	Falling
6	12	12	Neutral
4	15	7	Raising
2	20	0	Raising

→ If the price is Rs. 10 per kg, quantity supplied will be greater than the quantity demanded and there will be a tendency for the price to fall.

→ On the other hand, as the price falls. Say Rs. 2 per kg. The quantity demanded will increase and the quantity supplied will decline and there will be a tendency for the price to increase.



→ At price is Rs. 6 per kg, 12 Thousand kg are demanded, (ie) The quantity demanded is equal to quantity supplied.

∴ Rs. 6 per kg refers equilibrium — price

∴ Quantity will be equilibrium — quantity.



## Demand forecasting EnggTree.com

- It is a technique for estimation of probable demand for a product (or) service in the future
- It is based on the analysis of past demand for that product in the market condition
- This concept is called forecasting of demand or estimation of future demand

### Example

→ Suppose, we sold 200, 250, 300 units of product 'X' in the month of January, February, March respectively.

→ Now, we can say that there will be a demand for 250 units approximately of product 'X' in the month of April, if the market condition remains the same

→ Demand plays a vital role in the decision making of a business. Many decisions of business depends on demand like production, sales, staff requirements, etc.

→ Fore-casting is the necessary for a business at an international as well as domestic level.

→ Demand forecasting is a business risk related to business activities and helps it to take efficient decisions.

### Types of Forecasting:

→ Based on economy

- micro-level
- Industry level
- Firm level.

→ Based on time period

- Short-term
- Long-term.

#### 1. Micro-level Forecasting:

→ It deals with the general economic environment related.

→ National income, general level employment & etc.

#### 2. Industry-level Forecasting

→ It deals with the demand for the industry products as a whole.

→ Example: \* Demand for cement in India.  
\* Demand for clothes in India

#### 3. Firm-level Forecasting:

→ Demand for particular firm product

→ Example: \* Demand for Birla cement  
\* Demand for Raymond clothes.

### Short-term forecasting:

- It covers a short period of time, depends on the nature of the industry.
- It is done generally for 6 months or less than a year.

### Long-term forecasting:

- Long-term forecastings are for a longer period of time say two to five years or more.
- It gives information for major strategic decisions of the firm
- Example \* Expansion of plant capacity  
\* Opening a new business unit



Welfare Analysis

Customers and producers surplus - price ceilings and price floors; Customer behaviour  
Axioms of Choice - Budget constraints and Indifference curves - Customer Equilibrium  
Effects of a price change, Income and Substitution Effects Derivation of a Demand Curve

(or) customer surplus,  
Consumer Surplus (or) Social Surplus

→ The measured economic value of the air we breathe is zero, yet air's contribution to welfare is immeasurably large

→ The gap between the total utility of a good and its total market value is called customer surplus.

(or)

→ In economics, The difference between the price a customer pays for an item and the price he would be willing to pay rather than do without it

(or)

→ Customer Surplus is a measure of Customer welfare and is defined as the excess of social valuation of product over the price actually paid

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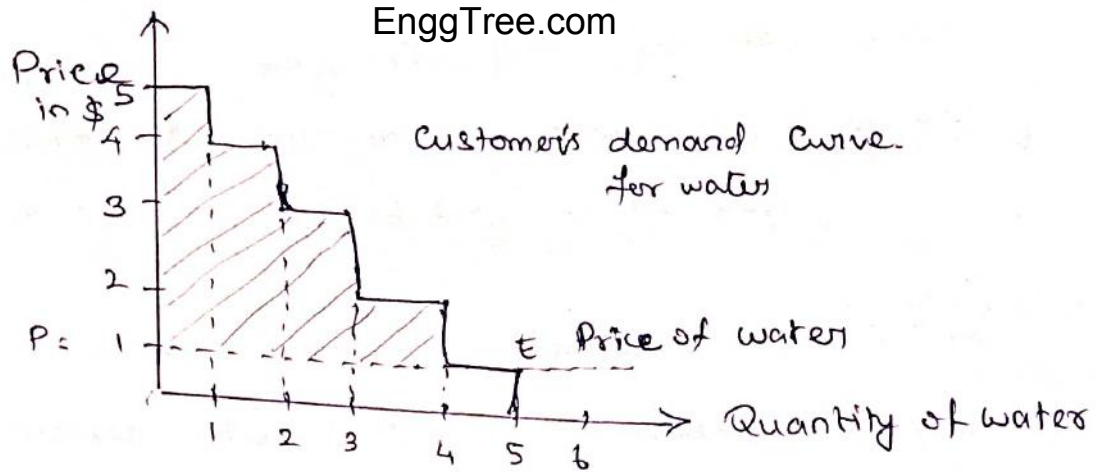


Fig: Customer's satisfaction

— exceeds what is paid

- We pay the same amount for each glass of water.
- The downward-sloping demand for water reflects the diminishing marginal utility of water.
- The area between the demand curve and the price line is the total customer surplus.
- Here, an individual customer water, which has a price of \$1 per gallon. This is shown by the horizontal just line at \$1.
- The customer considers how many gallon jugs to ~~buy~~ buy at that price.
- Extreme think, a customer is willing to pay \$5 for it, but the gallon market price is only \$1, so the customer has gained a surplus of \$4.

EnggTree.com  
→ Customer pay the price of the last unit for all units consumed, they enjoy a surplus of utility over cost.

→ Customer surplus measures the extra value that consumer receive above what they pay for a commodity.

### Producer surplus:

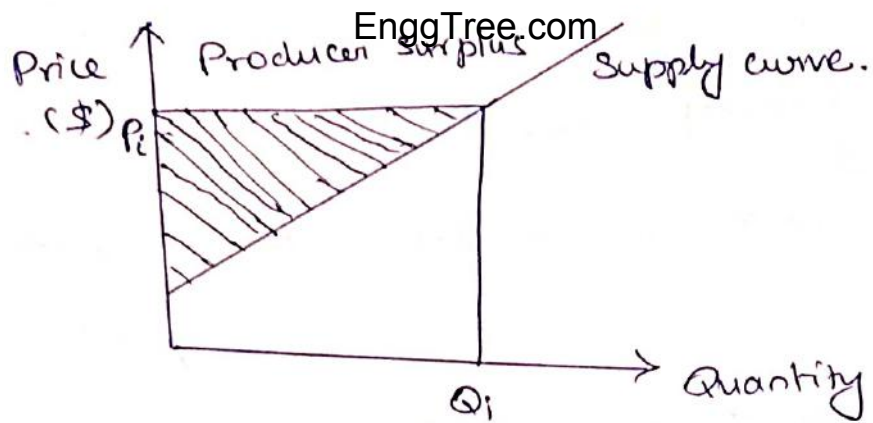
→ The difference between the price received for a product and the marginal cost to produce it.

→ Because marginal cost is low for the first units of good produced, the producer gains the most from producing these units to sell at the market price.

→ The welfare or benefit enjoyed by producer who sell for a price higher than the price they would have been willing to sell.

→ Graphically, the area above the supply curve and below the price in the market.





→ Formula for producer surplus

$$= \text{Total revenue} - \text{Total cost}$$

→ Market tend to fluctuate, especially because consumers are able or willing to spend at different price points for any given product or service. This is where a surplus is created.

### Definitions:

\* To calculate consumer surplus we need to know the difference between the cost consumers are willing to pay for a product or service and the actual market price.  $[CS = \frac{1}{2} \times Q_d \times \Delta P]$

\* Producer surplus is the difference between the minimum price a producer is willing to accept for their goods or service and the final price they receive.

- \* Social Surplus is the sum of consumer surplus and producer surplus.
- \* Price floors set a minimum on a price
- \* Price ceilings set a maximum on a price.

What is customer surplus?

→ Customer surplus is an economic measurement calculating the excess cost that customers are willing to pay for a product or service in comparison to the actual market price.

Example problem:

→ A shopper is browsing for a new television. Specifically, she wants a 42" OLED Smart TV, and she set a maximum budget of \$1300. To her joy and surprise, she finds a TV meeting all of her exact requirements for only \$950. That \$350 cost difference of what she paid versus

what she is ~~EnggTree.com~~ spend on other product, goods or service.

→ To put it in the simplest terms, Consumer Surplus is when you think you got a good deal because you paid less than you were expecting.

→ on large scale, we can use an extended consumer surplus formula.

$$\text{Consumer Surplus} = \frac{1}{2} \times Q_d \times \Delta P$$

$Q_d$  - The quantity at equilibrium where supply and demand are equal.

$$\Delta P = P_{\max} - P_d$$

$P_{\max}$  - Price, a customer is willing to pay

$P_d$  - The price at equilibrium where supply and demand are equal.

### Example ②

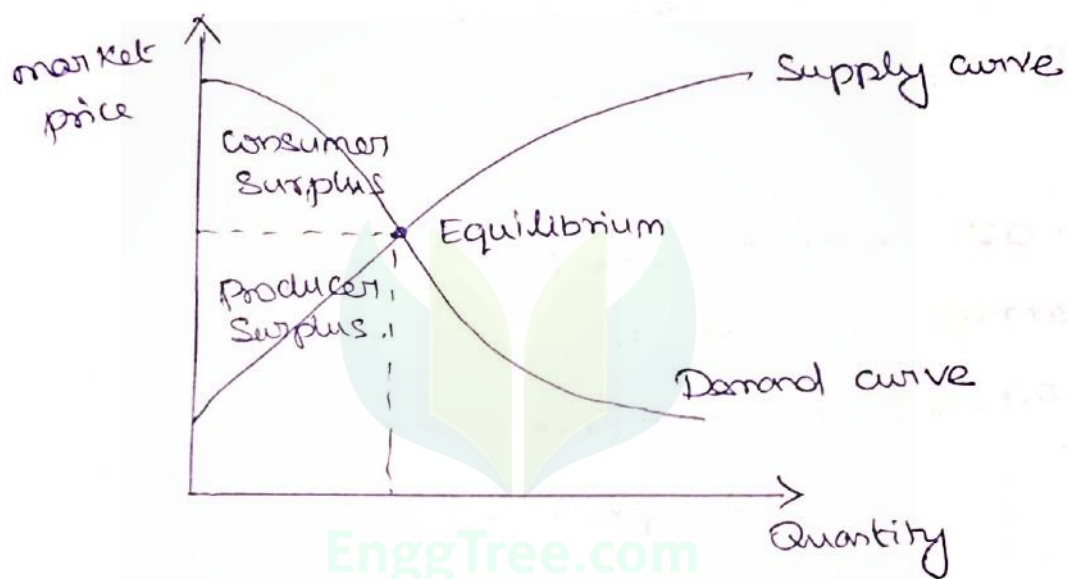
→ A customer is willing to spend \$8.00 on a new energy drink, but most customers are willing to pay only \$5.00, which is the equilibrium point where supply meet demand. At a \$5.00 retail value, the company supplies a store with 500 bottles to meet the demand.



→ Plugging the EnggTree.com into our formula gives us,

$$CS = \frac{1}{2} \times 500 \times (\$80 - \$5.0) \\ = \$750$$

→ Total of \$750 customer surplus shared amongst the customer who made a purchase at the equilibrium price point.



What is production surplus / Producer Surplus.

→ The difference between the minimum price a producer is willing to accept for their goods or service and the final price they receive.

→ A surplus happens when market prices exceeds the lowest price point that a producer will accept.

Example (1)

→ A car manufacturer decides to produce 10,000 of its newest sports model this year, over the past few years, the standard selling price has been \$90,000 for this type of vehicle, but this year, the economy is stronger than it's been in the past, and many consumers are paying more, up to \$150,000 in some cases since the supply is limited and the demand is higher than expected.

→ If a car buyer spends \$ ~~150~~ 150,000 on a vehicle instead of the expected \$90,000, the difference of \$60,000 is the producer surplus.

Note:

→ In simplest terms, producer surplus happens when a producer receives more revenue than expected for a good or service.

## How to calculate <sup>EnggTree.com</sup> producer surplus (PS)

- when looking at a demand-Supply graph, the supply curve is always going to be sloping upward due to the law of increasing returns.
- we can calculate producer surplus with this formula;

$$PS = \text{Total revenue} - \text{Total cost}$$

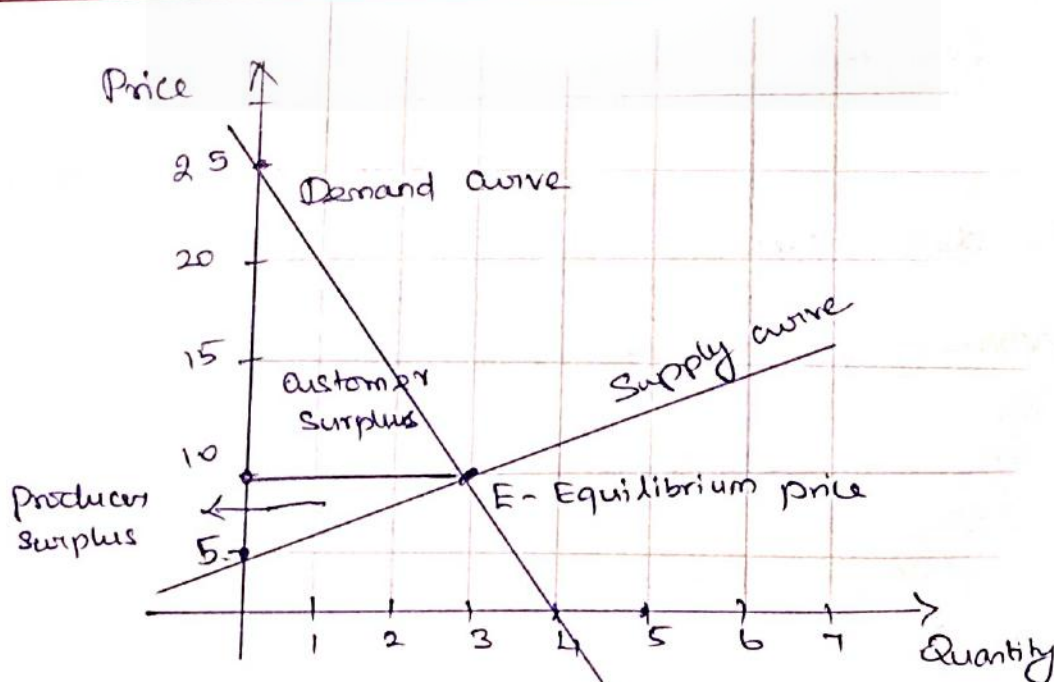
$$\text{also, } PS = \frac{1}{2} \times Q \times (P_1 - P_2).$$

Q - Quantity.

$P_1$  - Price to be sold at consumer end.

$P_2$  - minimum price any producer is willing to sell

Example ② Calculate consumer surplus & producer surplus using following graph.





→ In the graph, Equilibrium price is \$10

and Equilibrium quantity is 3 units.

The Customer Surplus area is highlighted above the equilibrium price line.

This area can be calculated as the

area of triangle  $A = \frac{1}{2} (b \times h)$ .

$$= \frac{1}{2} (\text{base} \times \text{height}).$$

→ By applying above formula for calculating Customer Surplus,

$$A = \frac{1}{2} (b \times h),$$

$$= \frac{1}{2} (3 \times 15)$$

$$= 22.5 \text{ (Customer Surplus)},$$

→ Similarly, for producer surplus,

$$A = \frac{1}{2} (1 \times 3)$$

$$= 1.5 \text{ (producer surplus)}$$

### Dead weight loss

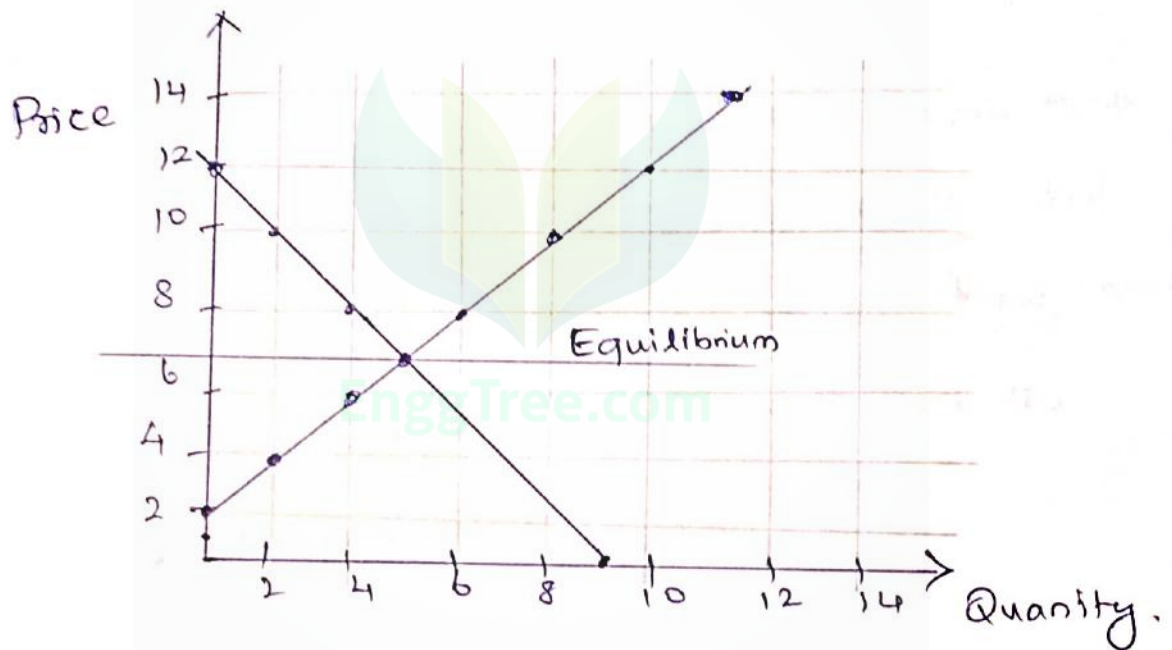
→ The loss is social surplus that occurs when a market produces an inefficient quantity.

## Social (or economic or total) Surplus.

→ The sum of ~~costs~~ consumer and producer surplus at some quantity and price of output

→ In other words, sum of all the surpluses of market participants.

Example: The graph below shows the supply and demand curves for soda.



$$\begin{aligned}\text{Customer Surplus (CS)} &= \frac{1}{2} \times (b \times h) \\ &= \frac{1}{2} \times (5 \times 5) = 12.5\end{aligned}$$

$$\begin{aligned}\text{Producer Surplus (PS)} &= \frac{1}{2} \times (b \times h) \\ &= \frac{1}{2} \times (5 \times 5) = 12.5\end{aligned}$$

$$\begin{aligned}\text{Social Surplus} &= \text{CS} + \text{PS} \\ &= 12.5 + 12.5\end{aligned}$$

Price ceiling:

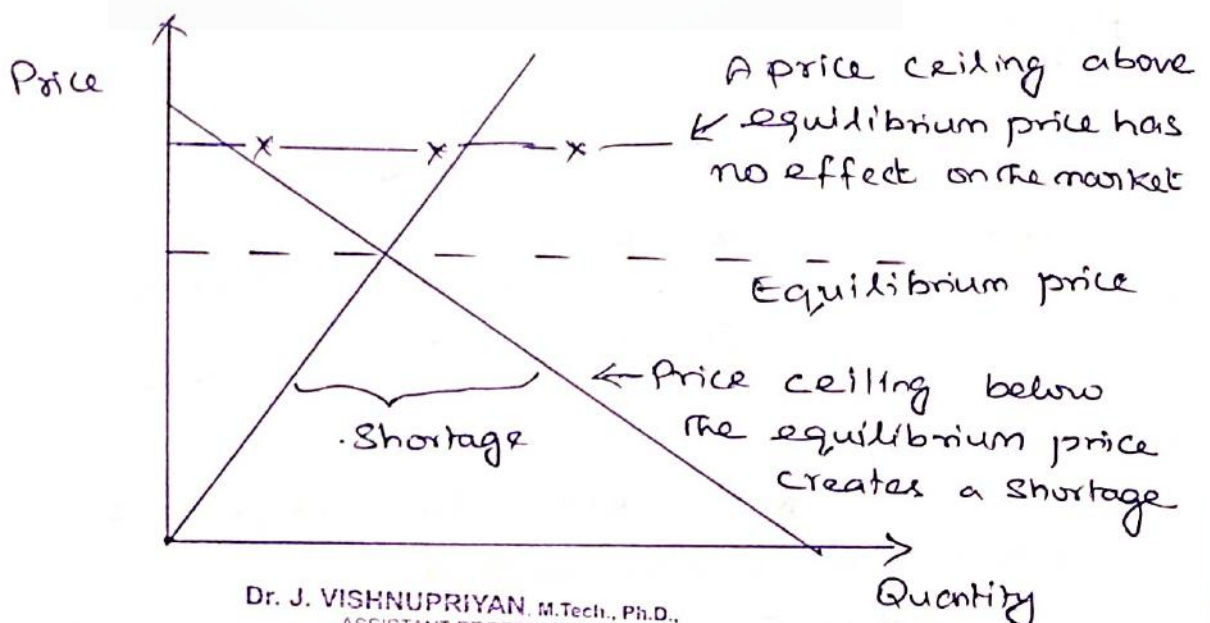
→ A price ceiling keeps a price from ~~not~~ rising above a certain level.

→ A price ceiling is a maximum price that can be charged for a product or service.

→ A price ceiling that is larger than the equilibrium price has no effect

Example:

→ Rents controls, which limit how much landlords can charge monthly for residences (and often by how much they can increase rents), are the examples of a price ceiling.





Price ceiling - Pros

- keeps price affordable
- Prevents price - gouging
- Stimulates demand

Price ceiling - Cons

- often causes supply shortage
- May induce loss of quality, corner cutting
- May lead to extra charges or boosted prices on other goods.

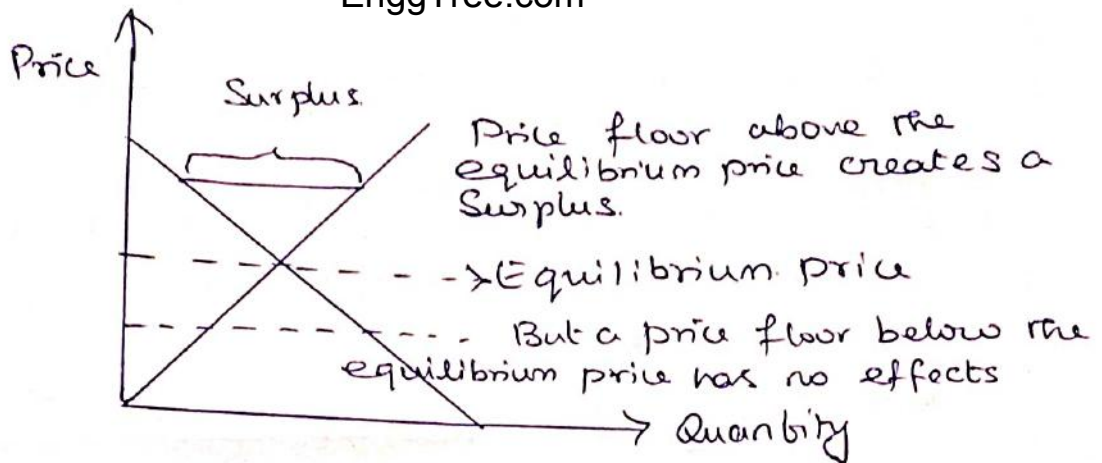
Price Floors:

→ A price floor is a government or group-imposed price control (or) limit on how low a price can be charged for a product, goods, commodity, or service.

→ A price floor is the lowest legal price that ~~can~~ can be paid in market for good & services, labor or financial capital

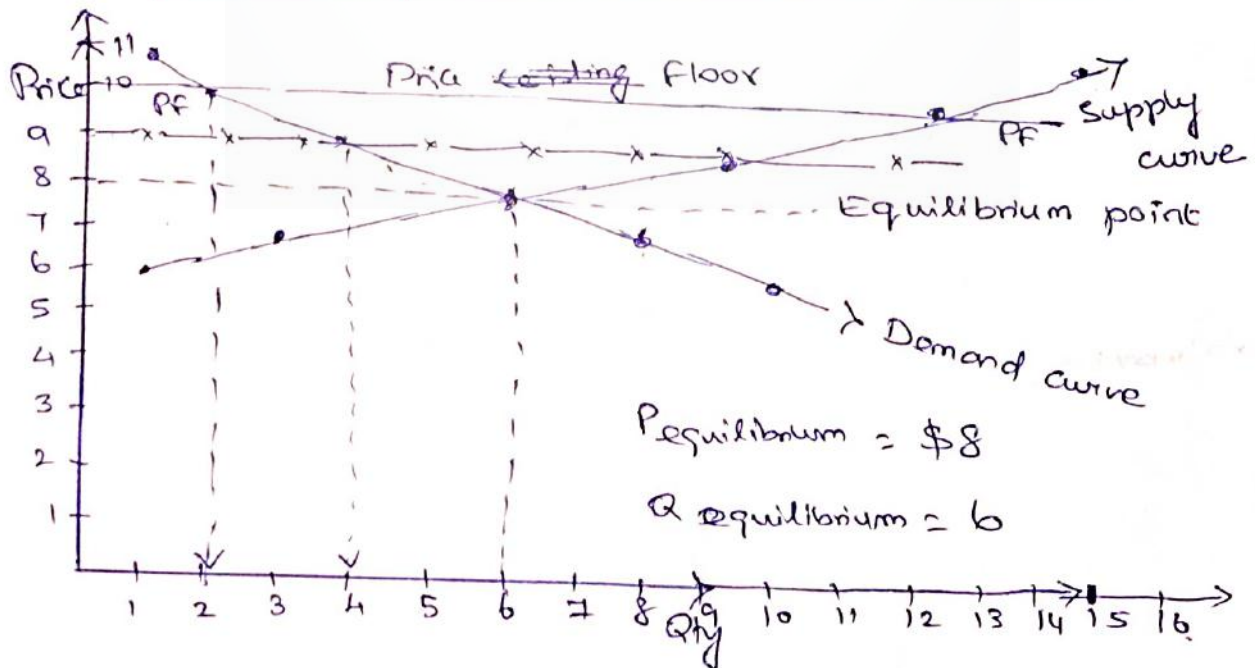
Example : \* Minimum wage.

\* Minimum prices set by Govt. on Alcohol.



Problem: one Price ceiling (PC) & price floor (PF).

Price	Qty Demanded (M)	Q Supplied (M)
\$11	1	15
\$10	2	12
\$9	4	9
\$8	6	6
\$7	8	3
\$6	10	1



$$PF \Rightarrow \$10 \Rightarrow Q_{\text{Demand}} = 2 = Q_{\text{Price floor}}$$

$$PC \Rightarrow \$9 \Rightarrow Q_{\text{Demand}} = 4 = Q_{\text{Price ceiling}}$$

- In this study, individual behaviour, group behaviour or organization activities are to be studied.
- The activities associated with purchase, use and disposal of goods and services.
- Customer behaviour consists of how the consumer's emotion, attitudes and preferences affect buying behaviour.
- Customer behavior is the analysis of how consumers make decisions about what to buy, when to buy it, and what reason need to buy & etc.

### Types of customer behavior

1. Habitual buying behavior
2. Variety-seeking behavior
3. Dissonance-reducing buying behavior
4. Complex buying behavior



## Why is consumer behavior important?

- It helps marketers understand what influences consumers' buying decisions.
- How consumers decide on products they can fill in the gap in the market.
- Identify the products that are needed and the products that are obsolete.

What are the factors that influence consumers' behavior to say yes on a product?

- Personal factor — Individual interest
  - \* age \* gender \* culture
- Psychological factor — Consumers' perceptions & attitude.
- Social factors —
  - \* Family \* Friends \* Education level
  - \* Social media \* Income

## Types of consumer behavior

### 1. complex buying behavior

→ This type of behavior is encountered when consumers are buying an expensive product

→ They involve highly research about the product before the high investment

→ Example: Buying a house or Car

### 2. Dissonance - reducing buying behavior

→ The consumer is highly involved in the ~~proper~~ purchase process but has difficulties determining the differences between brands.

→ They will regret their choice

### 3. Habitual buying behavior

→ The consumer has very little involvement in the product or brand

→ Buying a preferred type of brand

### 4. Variety Seeking behavior

→ A consumer purchases a different product not because they were n't satisfied with the previous one,

They seek variety

## What affects Consumer behavior?

1. Marketing campaigns - Such as Facebook ads for e-commerce, can even be used as reminder for products / services
2. Economic conditions - A positive economic environment is known to make consumers more confident and willing to indulge in purchases.
3. Personal preferences - Priorities.
4. Group influence - Peer pressure also influences consumer behavior.

## Customer behavior patterns

- Place of purchase
- Time & frequency of purchase
- Method of purchase - credit card  
- online

## Customer behavior Segmentation

- Occasion or Time based - Birthday
- Brand loyalty status
- Benefits Sought - A customer who buys toothpaste can look for whitening, flavor etc.



## Axioms of choice (Ac)

- Axiom of choice, sometime called Zermelo's axioms of choice, statement in the language of set theory that makes it possible to form set by choosing an element simultaneously from each members of an infinite collection of sets even when no algorithm exists.
- Every non-empty collection of non-empty set admits a choice function.
- Fix a non-empty collection of non-empty set  $A$ , and define the collection of parallel choice functions for  $A$ .
- Axiom of choice allows to extract elements from an infinite no. of infinite large set at once.

## Example: Non-Axioms of choice (Non-Ac)

- If  $A = \{1, 2, 3\}$ ,  $B = \{3, 4, 5\}$ ,  $C = \{5, 6\}$ . it is easy to pick an element from each set. Say 1 from  $A$ , 3 from  $B$ , 6 from  $C$ . [Dealing with finite number, finite graph, finite people etc], never need

### Example : Axiom of choice (AC)

- To choose one sock from each of infinitely many pair of socks requires the axiom of choice. But for shoes the axiom is not needed.

### In-difference curve:

- An indifference curve shows a combination of two goods in various quantities that provides equal satisfaction (utility) to an individual.
- It is used in economics to describe the point where individuals have no particular preference for either one good or another good based on their relative quantities.
- A curve on a graph (The axes of ~~to~~ which represent quantities of two commodities) linking those combinations of quantities which the customer regards as of equal value.

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What is an indifference curve?

→ An indifference curve is a chart or graph showing various combinations of two goods (or) commodities, that leave the customer equally well off or equally satisfied.

Example:

→ When asked to choose between  
Combination A - 1 unit of food & 6 unit of clothing  
Combination B - 2 unit of food & 3 unit of clothing.

Indifference combination

Combination	Food	clothing
A	1	6
B	2	3
C	3	2
D	4	1.5

→ we measure units of clothing on one axis and units of food on the other axis



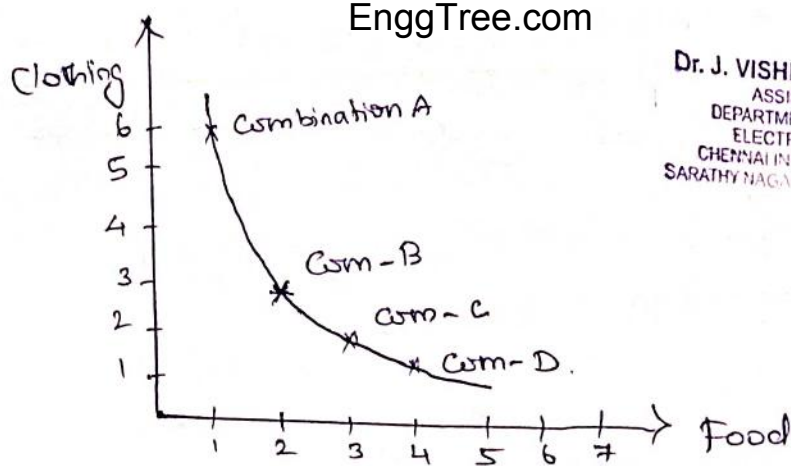


Fig ① Indifference curve.

→ The curved contour of linking up the four points, is an indifference curve

### Law of substitution:

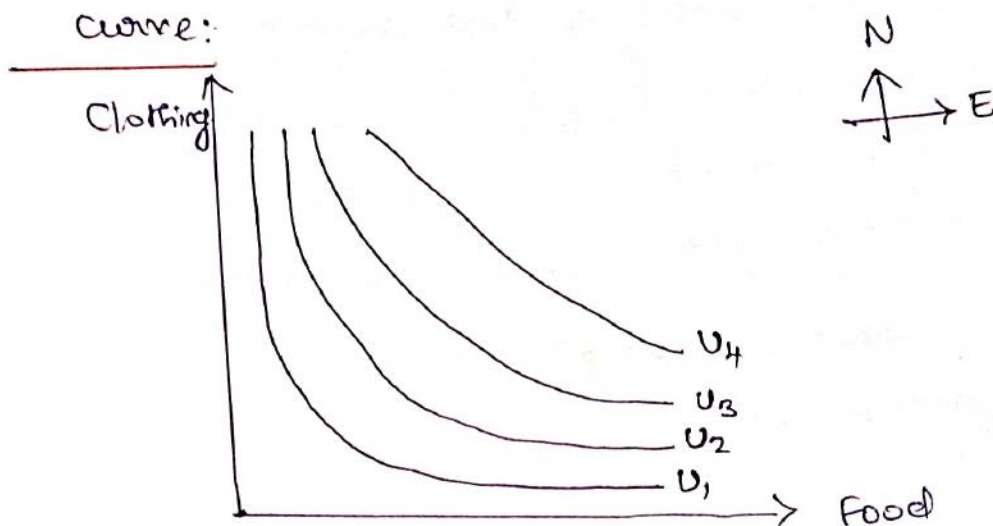
→ The indifference curves are drawn as convex shaped

→ Going from point 'A' to 'B' in the indifference curve, we would swap 3 of your 6 clothing unit for 1 extra unit food.

→ Similarly, from point 'B' to 'C', we would sacrifice only 1 unit of your clothing supply to obtain a 3-unit food; and so on.

→ ~~The~~ while points joining from 'A' to 'B', we neglecting some units. These are called as substitution ratio between

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Higher level of satisfaction is indifference



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Fig 2 A family of indifference curves.

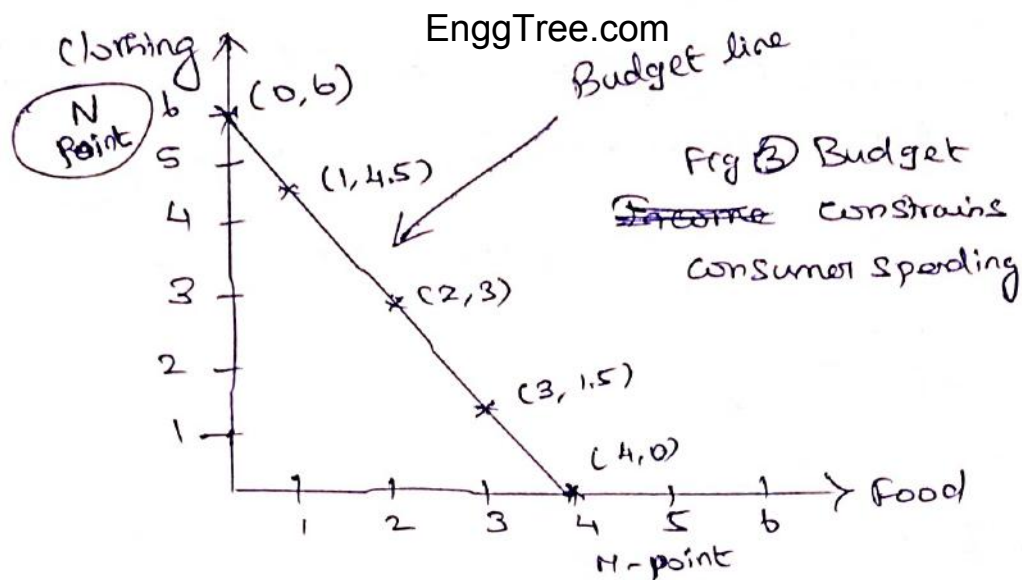
- In this graph, the curves are labeled as  $U_1, U_2, U_3, U_4$ .
- the indifference curve plays neither climbing nor descending.
- A consumer who moves one position to another along a single indifference curve enjoys neither increasing nor decreasing satisfaction from the change in consumption.
- Note that as we increase both goods and that move in a north-east direction across the map, hence the consumer reaching higher level of satisfaction.
- \*  $U_3$ -curve higher level of satisfaction than  $U_2$
- \*  $U_4$ -curve higher level of satisfaction than  $U_3$  curves.

## Budget Line on EnggTree.com Constraint

- A consumer has a fixed income. He says, \$6 per day to spend and he is confronted with fixed price for each food and clothing units.
- He decided, \$1.5 for Food & \$1.0 for clothing.
- It is clear that he could spend his money on any one of a variety of alternative combinations of food & clothing.
- At one extreme, he could ~~buy~~ buy 4 food units ( $1.5 \$ \times 4 = 6 \$$ ) and no clothing;  
At the other, 6 clothing ( $\$1 \times 6 = \$6$ ) and no food.
- The table shown some of possible ways in which he could allocate his \$6.

	Food	clothing	
M-point	4	0	} Alternatives possibility
	3	1.5	
	2	3.	
	1	4.5	
N-point	0	6.	





→ Figure plots five of these possibilities -  
All the points ~~line~~ lie on a straight  
line, labeled "N-M".

→ The slope of "N-M" is 6-unit clothing  
A 4-units food, leads to  $\frac{6}{4} = \frac{3}{2}$ ,  
which is the ratio of food price to  
clothing price.

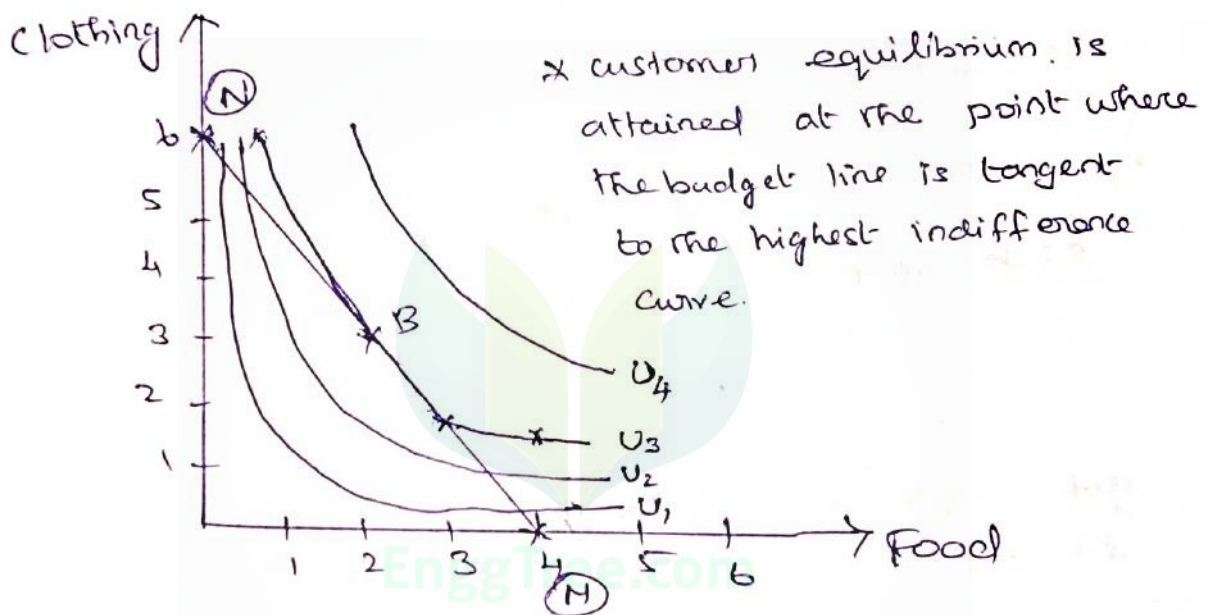
→ The meaning of the slope is that,  
given these prices, every time our  
consumer gives up 3 clothing units &  
he can gain 2 units of food,

→ we call "NM" line consumer  
budget line or Budget Constraint

# Customer Equilibrium effects of a price change, income change and Substitution effects.

## Equilibrium position of tangency.

→ Now, we are ready to put our previous figures ① to ③ drawn together,



→ The consumer is free to move anywhere along 'NM.'

→ Positions to the right and above 'NM' are not allowed because they require more than \$6 of income.

→ Obviously, to that point "B" yields greatest satisfaction

→ At the tangency, the budget line does not cross an indifference

contour.

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ELECTRONICS ENGINEERING

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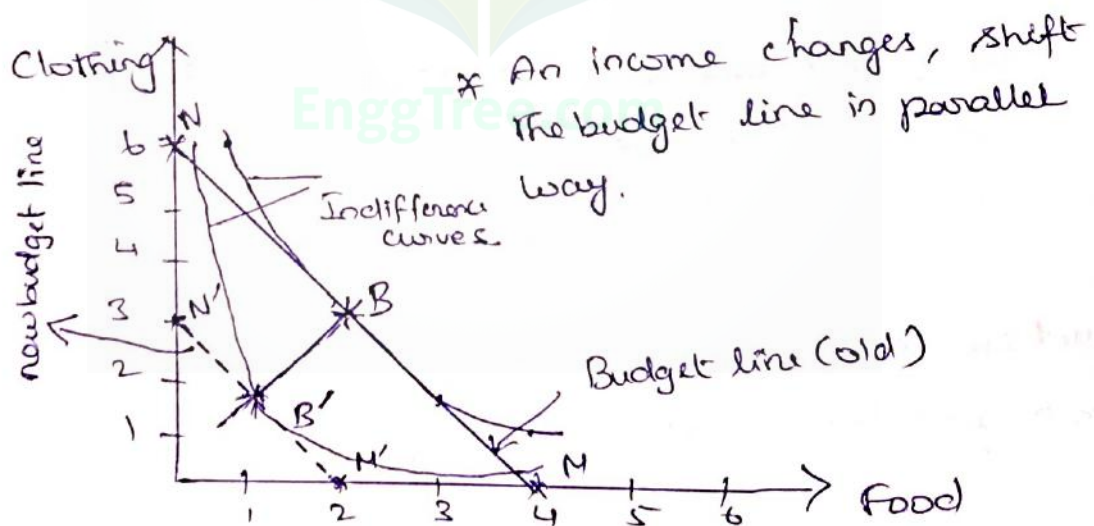
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$$S_r = \frac{P_{\text{Food}}}{P_{\text{Clothing}}} = \frac{MU_{\text{Food}}}{MU_{\text{Clothing}}}$$

Change in Income — on indifference curve

→ Assume, the customer's daily salary is \$6. Now, the consider that the salary or income is halved while the two prices remain same.

→ we should find that the new budget line occupies the position N'M' in the graph.



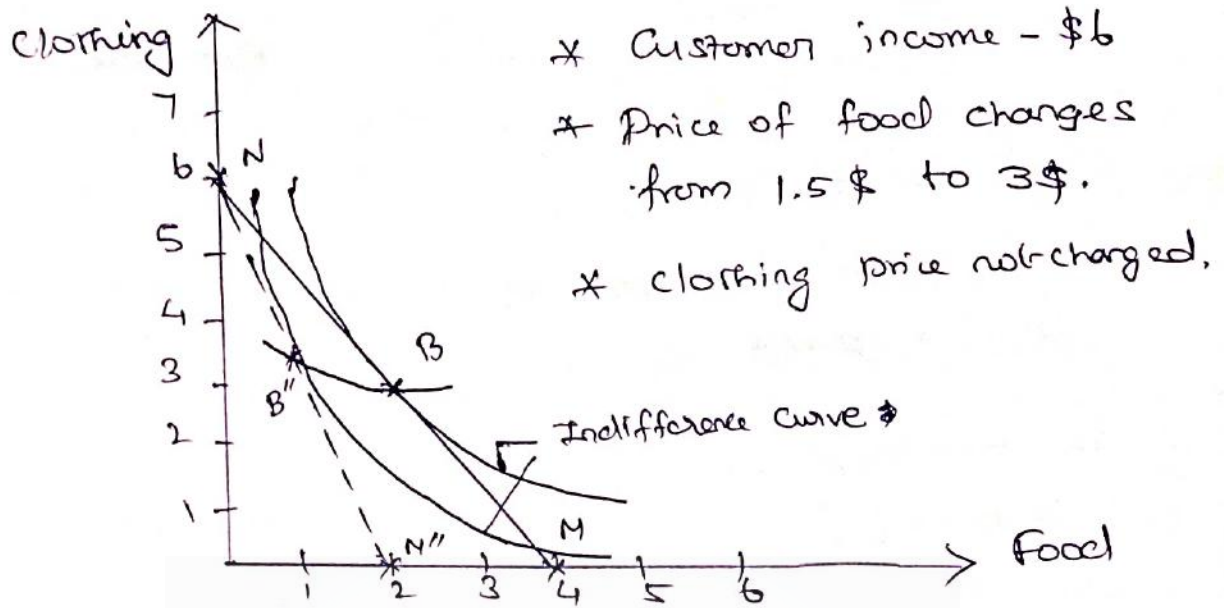
→ Thus, halving income to \$3 shift MM to N'M', moving equilibrium to B'

→ Now the consumer is free to move only along this new budget line.

→ To maximize satisfaction, he move to the highest attainable indifference curve [B' point]



## Change in price EnggTree.com Indifference curve.



Old Budget line -  $NM'$  - Line

Revised budget line -  $NM''$  - Line

→ Point 'M' - (which represents 4 food units),  
 - ( $\$1.5 \times 4 \text{ unit} = \$6$ ).

→ With food costing \$3 per unit, only 2 units can now be bought with a daily income of \$6.

→ Equilibrium is now at  $B''$ , and we have a new tangency point with indifference curve.

→ Higher food price has definitely reduced food consumption, but clothing consumption may move in either direction.

## Deriving the Demand curves:

- We are now in a position to derive the demand curve.
- As we increased the price of food from \$ 1.5 per unit to \$ 3 per unit, we kept other things constant.
- The consumer tastes as represented by the indifference curves did not change, and money income & price of clothing stayed constant.
- Therefore we are in the ideal position to trace the demand curve for food.
- At price of \$ 1.5, the customer buys 2 units of food, shown as equilibrium point 'B'.
- When price rises to \$ 3 per unit, the food purchased is 1 unit, at equilibrium point B'.
- If we draw the budget line corresponds to \$ 6 per unit of food, Equilibrium occurs at B'', & food purchases are 0.45 units.

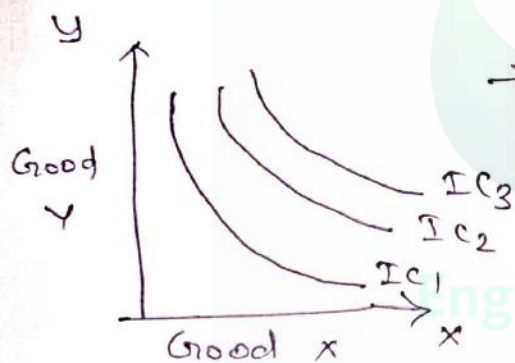
## Properties of indifference curves:

1. Indifference curves are negatively sloped,



→ It must be sloped downward from left to right.

2. Higher indifference curve represents higher level of satisfaction,



→ The curve,  $IC_3$  shows greater amount of satisfaction than

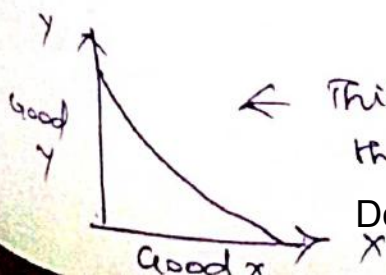
$IC_2$  &  $IC_1$

$IC_3 > IC_2 > IC_1$

3. Indifference curves are convex to the origin

4. Indifference curves can not intersect each other,

5. Indifference curves do not touch the horizontal or vertical axis,

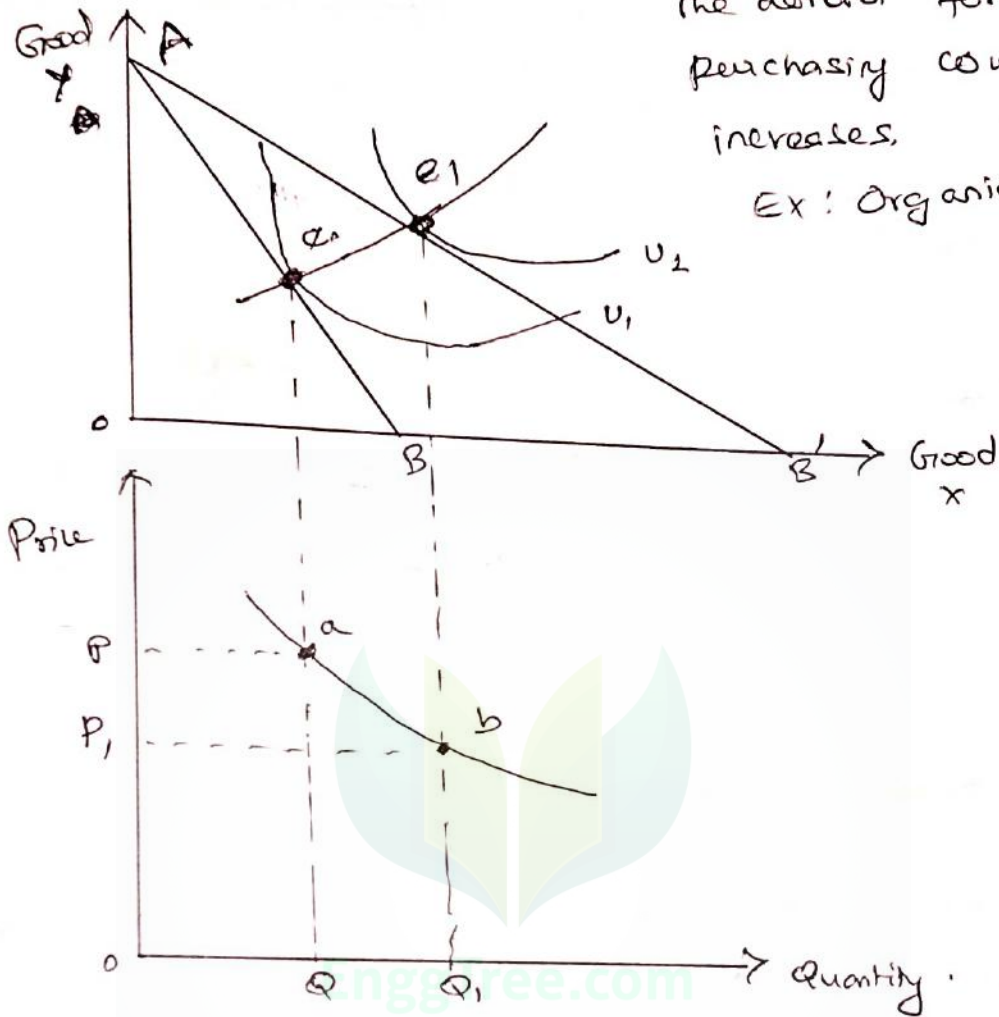


← This type of curves are against the IC assumptions



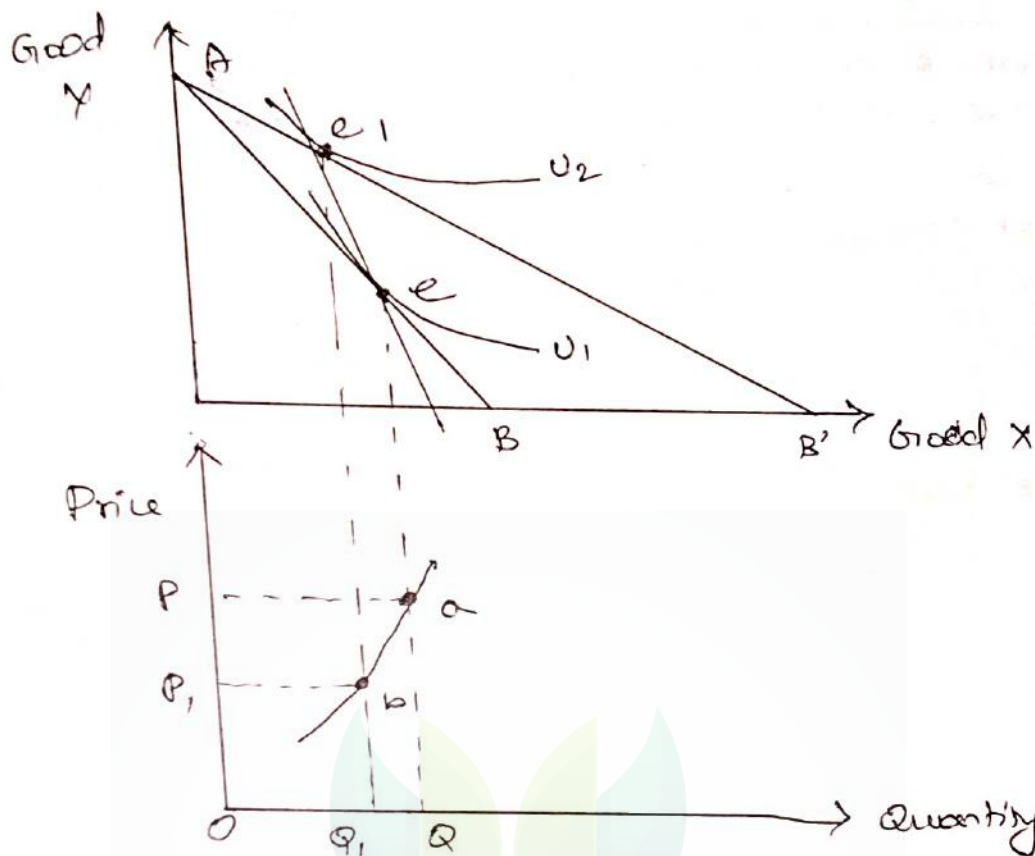
(A) Normal Good - When customer income ~~at~~ rises, the demand for good purchasing count increases.

Ex: Organic food



- AB - Initial price line.
- Suppose the price of Good 'x' changes, (fall), the revised price line will be AB'
- At lower price the quantity demanded increases
- The demand curve is downward sloping showing inverse relationship between price & quantity demanded as good is normal good.

(b) Derivation demand curve for inferior good



→ Inferior good is a good whose demand decreases when consumer income rises. Example: low income people uses

→ bicycle to go office

→ AB - Initial price line → High income people uses car to go office

→ At initial price, quantity demanded of good 'X' is 'OQ'.

→ At lower price 'OP1', quantity demanded decreases to 'OQ1'. This is shown in point 'b'.

→ Demand curve obtained by joining a & b  
Demand curve is upward sloping.

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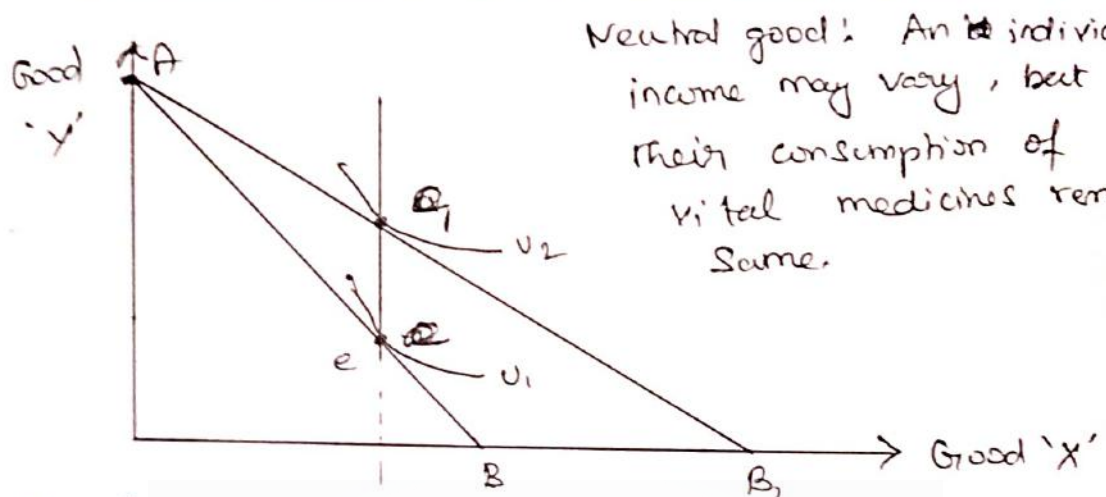
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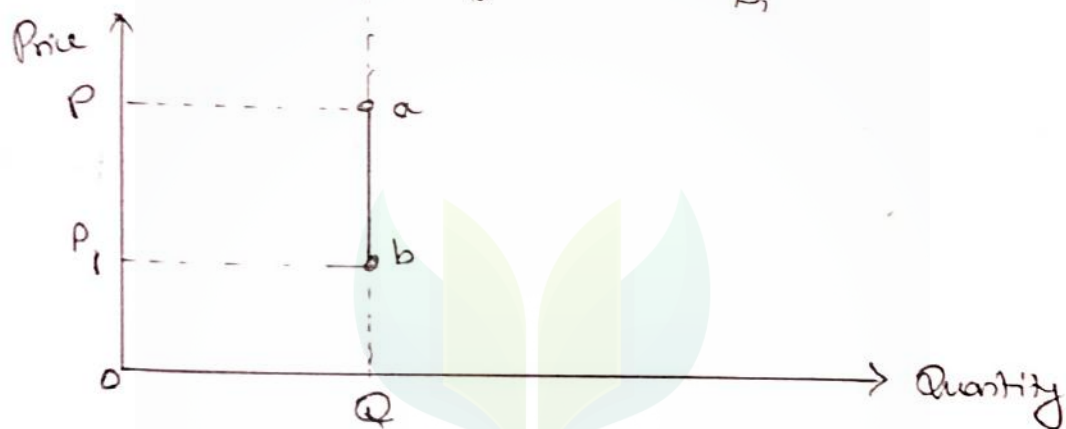
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(c) Derivation of Demand Curve for neutral good  
 Example: Prescription medicines.



Neutral good: An individual income may vary, but their consumption of vital medicines remains same.



- AB line represents initial price of neutral good.
- Initial price of good X is 'OP' & 'e' is the initial optimal consumption on indifference curve.
- When the price of good 'X' falls, say 'OP<sub>1</sub>', the budget line shifts to 'AB<sub>1</sub>' line.
- The optimal consumption on indifference curve is 'e<sub>1</sub>'.
- The demand curve is a vertical straight line. This is a neutral good.



## Production and cost function

Theory of production - Production function and  
 Isoquants - cost minimization - cost curves -  
 Total, average & marginal cost - long run -  
 Short run cost - Equilibrium of a firm  
 under perfect competition; monopoly &  
 monopolistic competition.

### What is theory of production

→ In economics, production theory explains the principles in which the business has to take decisions on how much of each commodity it sells and how much it produces and also how much of raw materials & how much it will use

→ The theory of production function depicts the relation between physical output of a production process & physical input

## Assumption EnggTree.com production theory

- Resources are given and remain constant
- Technology used in the production process remains constant
- Resources & technology are fully & efficiently utilized.

## Four types of production

1. Unit or Job type production
2. Batch type production
3. Mass production or Flow production
4. Continuous production or Process - production

### Unit or Job type production

→ It is observed ~~is~~ when you produce one single unit of a product.

→ Example : Small business like restaurants, individual products like tailored outfit or cake

Also, Design your own DELL laptop on their web site with the given specification.

### Features of unit production.

→ Depends on lot on skills.

→ Dependent more on manual work



## Batch type Engg Tree production

- It is most commonly used in consumer durables, such as industries where there are large variety of products with variable demands.
- The manufacturer already knows the no. of units he needs to a manufacturer and they are manufactured in one batch.
- If manufacturer has the shortage of product 'x' and 100 units of this product is consumed in one month, then the manufacturer can give order for batch ~~process~~ production of 100 units of product 'x'.
- LG has many different types of home appliances products in its portfolio. It has to manufacture all these different variants of the same type of product. There would be 10-20 type of mixer ~~grai~~ grinder alone in the product ~~port~~ portfolio of LG home appliances.



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→ The batch may be as small as <sup>10</sup> units or they may be as large as 1 lakhs units of the same products.

→ Example of batch production include FMCG like biscuits, packed food items etc

### Features of batch production:

- Demand plays a major role in batch production. Example - Seasonality of products
- The total no. of units required is decided before the batch production starts.
- Once batch production starts, stopping it midway may cost a huge amount to the company.

### Mass production (or) Flow production

- It is used in industries where continuous production is required,
- One of the best example of mass production is the manufacturing process

→ It is also known as assembly line production.

→ It is one of the most common type of products used in the automobile industry.

→ Mass production focus on specialization.

There are multiple work stations installed and the assembly line goes through all the work stations turn by turn.

→ The work is done in a specialized manner & each work station is responsible.

→ If 1000 products are manufactured using mass production, each one of them should be exactly the same. There should be no deviation in the product manufactured.

## Features of Mass production

- It is used only if the product is standardized,
- Mass production requires huge investment

## Continuous production or Process production

- There is a lot of confusion between mass production and continuous production,
- It can be ~~different~~ differentiated by single element. The amount of mechanical work is involved.
- In mass production, both machines and humans work in tandem, However, in continuous production, most of the work is done by machines rather than humans.
- In continuous production, the production is continuous 24x7 hours, in all days in a year



→ A good example of the continuous production is brewing.

→ The brewing production goes on 24-hours a day & 365 days a year. This is because brewing takes a lot of time and production is important.

→ There are many chemicals which are manufactured in the form of a continuous process due to the huge demand across the world,

### Features of continuous production

→ The work is continuous in nature.

→ Once production starts, it cannot be stopped otherwise it will cause huge losses.

Production function:

→ In economics, equation that expresses the relationship between the quantities of productive factors (such as labour and capital) used and the amount of product obtained.

→ It can also be used to determine the cheapest combination of productive factors that can be used to produce a given output

→ In symbolic logic the production function of a firm is;

$$Q = g(L, K, n)$$

where,

Q - output

g - Some function.

L - Labour.

K - Capital

n - natural resource

Isoquant

→ The term "isoquant" broken down in Latin, means "equal quantity"; with 'iso' means equal and 'quant' means quantity.

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What are isoquants in economics?

- An isoquant in economics is a curve that, when plotted on a graph, shows all the combinations of two factors that produce a given output.
- often used in manufacturing, with capital and labour as the two factors, isoquants can show the optimal combination of inputs that will produce the maximum output at minimum cost.

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What is Isocost & Isoquant?

- An isoquant shows all combination of factors that produce a certain output.
- An isocost show all combinations of factors that cost the same amount
- Both Isoquant & Isocost can show the optimal combination of factors of production to produce the maximum ~~at~~ output at minimum cost



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What is the difference between indifference curve and isoquant?

→ An indifference curve represents satisfaction, which cannot be expressed in physical units.

→ In contrast, the isoquant curve represents the output, which can be expressed in physical units.

Example : A given quantity of good 'X' can be produced using different combinations of labour and capital.  
Vertical axis → unit of capital (K)  
Horizontal axis → unit of labour (L).

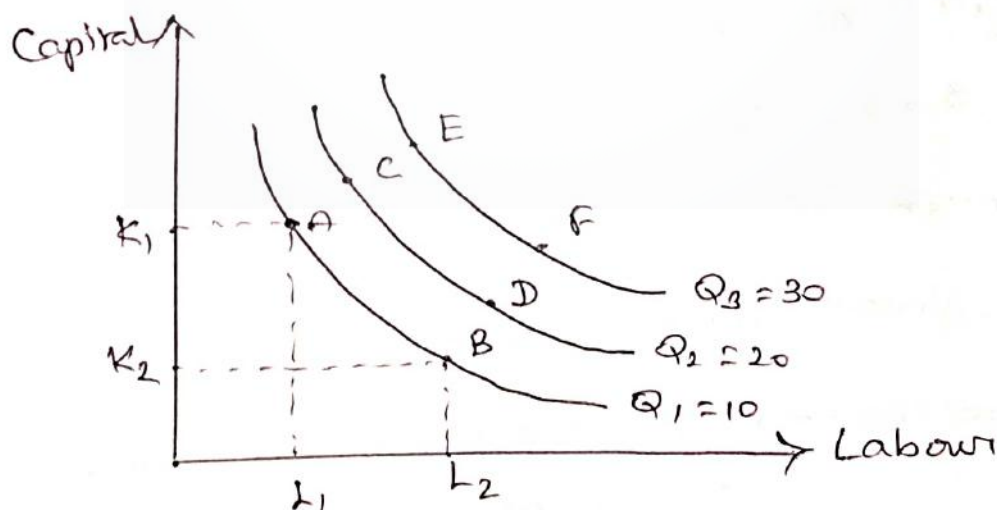


Fig: Isoquant / Isoquant map.  
curve

→ Point 'A' represents just one possible combination of 'K' and 'L' which can be used to produce  $Q_1$  unit of output.

→ Output  $Q_2$  and  $Q_3$  can be produced using any of the combinations of 'K' and 'L' represented by points along the isoquants.

### Cost minimization;

→ Cost minimization is a financial strategy that aims to achieve the most cost effective way of delivering goods and service to the require level of quality.

→ It is important to remember that cost minimization is not about reducing quality. It always remains important to meet customer needs.

Difference between profit maximization and cost minimization.

→ When we say, 'maximizing profits,' we aim at increasing the volume of sales.

and  
→ Keeping cost of production factors constant

→ But, 'minimizing cost' means reducing the waste, ~~unnecessary~~ unnecessary costs involved in the manufacturing of a product.

### Cost curve:

→ In economics, a cost curve is a graph of the cost of production as a function of total quantity produced.

- Total Fixed cost (TFC)
- Marginal cost (MC)
- Total variable cost (TVC)
- Average variable cost (AVC)
- Total cost (TC)
- Average total cost (ATC)

\* cost in the short run

\* cost in long run.



TFC : Total fixed cost

→ Costs independence of output  
eg: paying for factory.

MC : Marginal cost

→ The cost of producing an extra unit of output

TVC : Total variable cost

→ cost involved in producing more units, which in this case is the cost of employing workers.

Avc : Average variable cost

→ Total variable cost / quantity produced

TC : Total cost

→ total variable cost + Total fixed cost

→  $TVC + TFC$

$TVC + TFC$

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What is an isoquant and isocost curve?

→ An isoquant is a curve that shows all the possible combinations of inputs that yield the same output.

→ An isocost line shows all possible combinations of labor and capital that can be purchased for a given total cost.

Iso cost curve:

→ Imagine a situation in which the firm uses two inputs; labor ( $L$ ) and capital ( $K$ ), to produce output.

→ The price of labor ( $w$ ) & the price of capital ( $r$ ) are given; Therefore, the cost of employing  $L$  units of labor and  $K$  units of capital is  $[wL + rK]$ .

→ Iso-cost curve is the set of all input combinations  $(L, K)$  that cost the same given price  $(w, r)$ .

Example: let  $w=1$ ,  $r=2$

Iso-cost curve for cost equal to 10,  
→ is the set of input combinations that  
cost 10 and given is given by  $L + 2K = 10$

→ Likewise, iso-cost curve for cost  
equal to 20 is  $L + 2K = 20$ ,

→ for cost 40 is  $L + 2K = 40$ , there is the  
plot of these iso-cost curves;

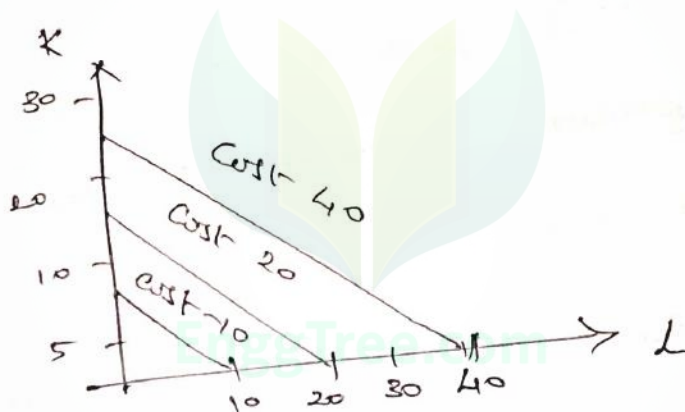


Fig: Iso-cost curve.

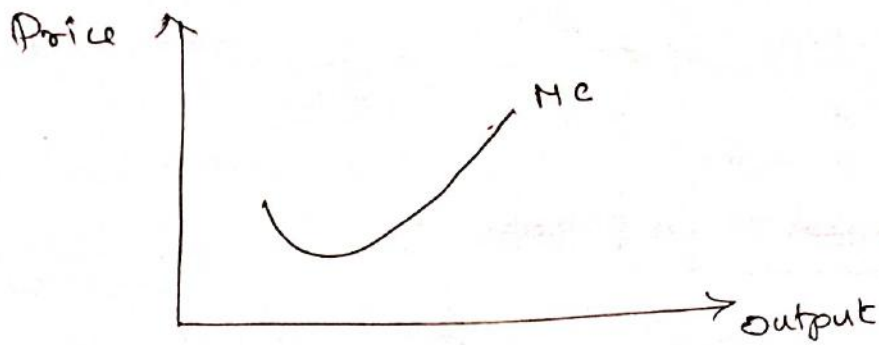
### Cost in the short run:

→ short run cost curves ~~tend~~ tend to  
be 'U' shaped because of diminishing  
~~the~~ returns.

→ In the short run, Capital is fixed.  
After a certain point, increasing extra  
workers leads to declining productivity



→ Therefore, as you employ more workers the marginal cost increases

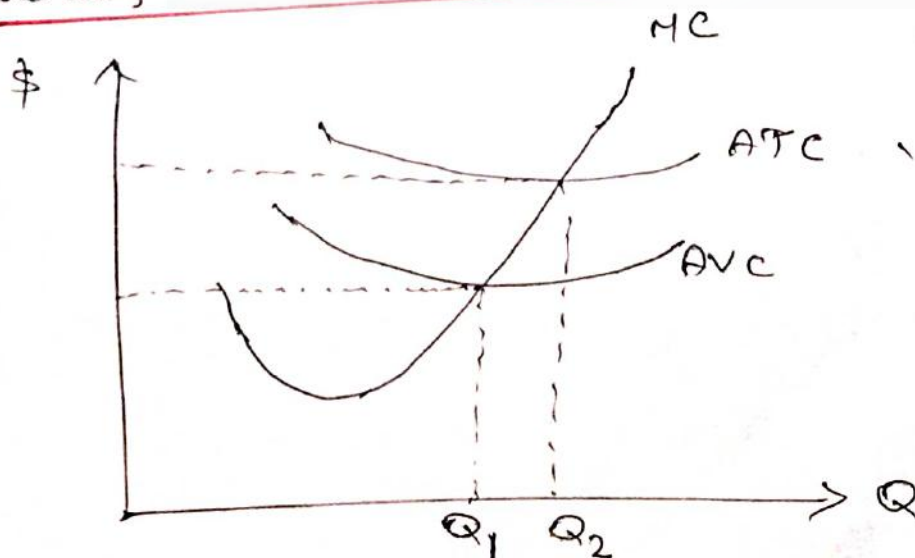


→ Because the short run marginal cost curve is sloped like this, mathematically the average cost curve will be 'U' shaped.

→ Initially average cost falls. When marginal cost ~~cost~~ is above the average cost, then average cost starts to rise

→ Marginal cost always passes through the lowest point of the average cost

Average cost curves:



'MC' < 'AVC'

AVC decreasing

'MC' > 'AVC'

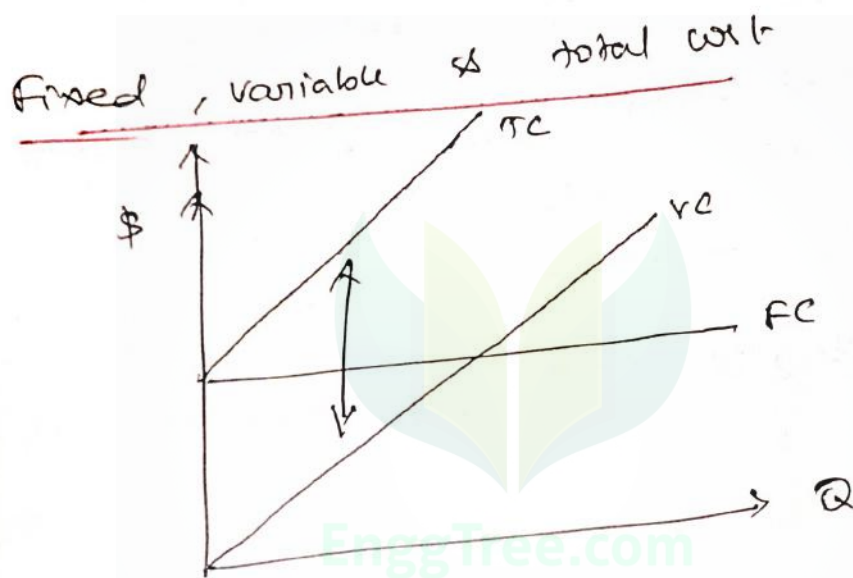
AVC increasing

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$$\text{Average Total Cost (ATC)} = \frac{\text{Total cost}}{\text{quantity}}$$

$$\text{Average variable cost (AVC)} = \frac{\text{Variable cost}}{\text{quantity}}$$

$$\text{Average fixed cost (AFC)} = \frac{\text{Fixed cost}}{\text{quantity}}$$



$$\text{Total cost (TC)} = [\text{Variable cost (VC)}] + [\text{Fixed cost (FC)}]$$

The structure of cost in the short run.

→ The average total cost curve is typically U-shaped. Average variable cost (AVC) calculated by dividing variable cost by the quantity produced.



→ The average variable cost curve ~~and~~ lies between the average total cost curve <sup>ATC</sup> and it is typically U-shaped (or) upward-sloping.

→ Marginal cost <sup>(MC)</sup> is calculated by taking the ~~cost~~ change in total cost between two levels of output and dividing by the change in output.

→ The marginal cost curve is upward sloping.

Labor	Qty	FC (\$)	VC (\$)	TC (\$)	MC (\$)	ATC (\$)	Ave (\$)
			80	240	5.0	15	5.0
1	16	160	160	320	3.3	8	4.0
2	40	160	240	400	4.0	6.6	4.0
3	60	160	320	480	6.6	6.6	4.4
4	72	160	400	560	10.0	7.0	5.0
5	80	160	480	640	20.0	7.6	5.7
6	84	160					

→ Since the total cost (TC) of producing 40 haircut is \$320, the average total cost for producing each of 40 haircuts is  $\$320 / 40$  or \$8 per haircuts.



→ Average cost curves are typically U-shaped

$$\rightarrow \text{Marginal cost (MC)} = \frac{\Delta C}{\Delta Q} = \frac{\Delta C}{\Delta Q}$$

$\Delta C$  - change in cost

$\Delta Q$  - change in quantity

MC - marginal cost

$$\rightarrow \text{Marginal cost} = \frac{\text{change in total cost}}{\text{change in quantity}}$$

For understanding see the below example

Unit produced	Total cost	marginal cost
0	100	0
1	350	250
2	530	180
3	670	140

→ Average total & variable cost

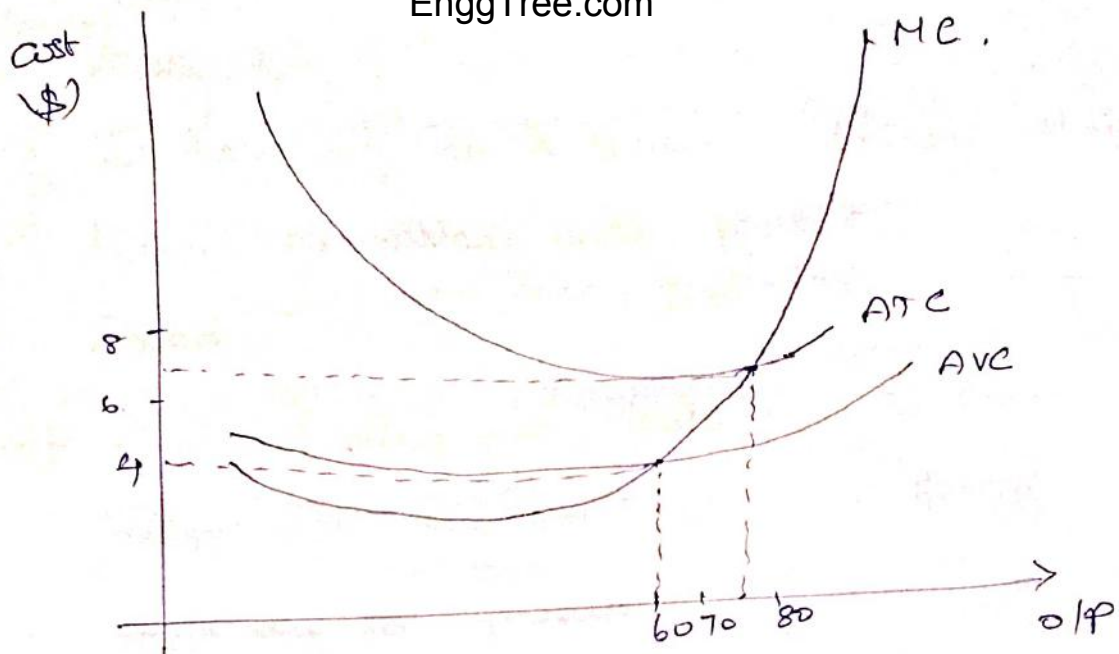
measure the average cost of producing some quantity of output

→ Marginal cost is somewhat different. Marginal cost is the additional cost of producing one more unit of output, so it is not the cost per unit of all units being produced.

→ The marginal cost curve is generally upward sloping, because diminishing marginal returns implies that additional units are more costly to produce.

→ A small range of increasing marginal returns can be seen in the figure as a dip in the marginal cost curve before it starts rising.

→ The marginal cost line intersects the average cost line exactly at the bottom of the average cost curve, which occurs at quantity of 72 & cost of 66¢.



Short run cost vs long run cost

→ The long run cost have no fixed factors of production, while short run cost have fixed factors and variables that impact production.

Examples for short run cost;

→ Reference to the cost that remains fixed in short period. These cost do not change with the change in the level of output.

→ For example; rent, interest, salaries



## Short run:

- In the short run scenario, any one of the factors associated with production is fixed.
- For achieving more output, the firms may change the level of other factors necessary for production.
- The factors that remain fixed are known as the fixed factors of production, while the variable factors are known as the variable factors of production.
- An example, of a short run ~~cost~~ can be a company ABC, which is able to produce 10 cars in a day, and looks to produce more cars (15 cars per day) by using the available infrastructure due to increase in demand during the season.

## Long run:

- In the long run, the factors associated with production, and also the associated costs, are variable.

→ In this period, a firm achieves flexibility in making decisions.

→ In addition to that, a firm can expect more competition in long run

→ An example, if a long run can be of the same company ABC, permanently looking to expand production capacity of cars instead of only during the season. It requires new land, labour, and equipment in addition to the existing infrastructure.

Diminishing interest (or) Reducing Balance rate.

→ An interest rate that is calculated on the outstanding loan amount every month is known as the reducing or diminishing interest rate.

→ In this method EMI comprises the principal repayment plus the payable interest on the loan amount that is outstanding.

~~Def~~Diminishing marginal product Law:

→ An economic rule governing production which holds that if more variable input units are used along with a certain amount of fixed input, the overall output might grow at a faster rate initially, then at a steady rate, but ultimately, it will grow at a declining rate.

Example:

→ If a factory employs workers to manufacture its products, at some point, the company will operate at an optimal level; with all other production factors constant, adding additional workers beyond this optimal level will result in less efficient operations.

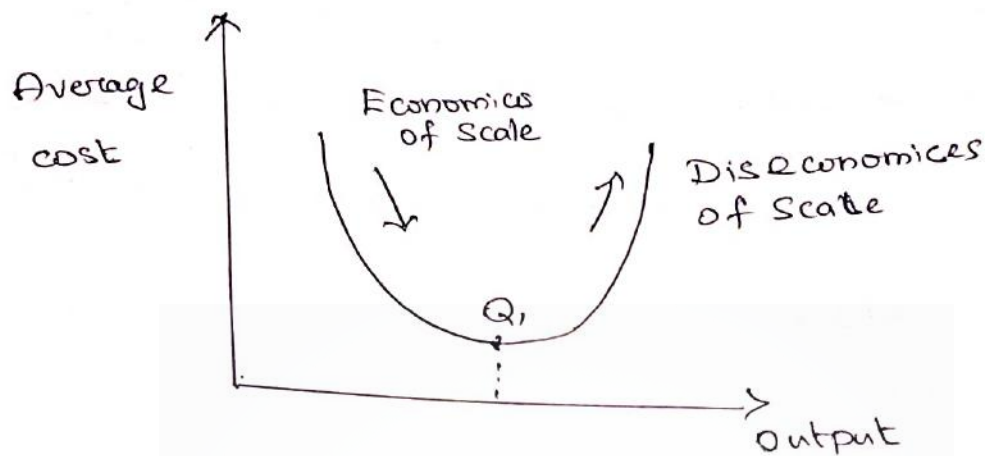
Diminishing returns:

→ As investment in a particular area increases, the rate of profit from that investment, after a certain point, cannot continue to increase if other variables remain at a constant.



## Diseconomies of Scale

→ Diseconomies of Scale happen when a company or business grows so large that the costs per unit increase.



→ For example, the graph shows that at a point ' $Q_1$ ', average cost start to increase

→ It means that, the Average unit cost start to increase.

### Example:

→ A coffee shop serves 100 customers an hour and employs 5 people at \$15 an hour to do so - ; which equals to \$75 per hour. If turn, each employee serves 20 customers.

→ The coffee shop sees an increase in demand, so there are now 140 customers per hour. The store responds by

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hiring two new staff members to serve the extra 40 customers.

→ However, the store has not increased in size, so the new staff starts getting in everybody's way and making orders twice. This subsequently means that they are only able to serve 30 additional customers.

→ These workers cost the coffee shop an extra \$30, which works out as a cost of \$1 per customer. This is far lower than the 100 customers served by the 5 other workers at a cost of 0.75 per customer (or) workers cost \$75.

### Monopolistic Competition:

→ Monopolistic competition exists when many companies offer competing products or service that are similar, but not perfect substitutes. (Imperfect competition).

→ the competing companies differentiate themselves based on pricing and marketing decisions.

→ Example: Restaurants, hair salons, house hold items,

## Monopoly Competition;

- A monopoly is a type of imperfect competition in which a company and its product dominate the industry.
- This situation arises when there is no competitor in the market for the same product.
- The competitor are unable to enter the market due to high barrier of entry.
- Monopolies enjoy a significant market share due to the absence of any competitors.

### Monopoly Competition,

1. Seller or producer captures the majority of the market share due to lack of competitors
2. No. of player : 01
3. Degree of competition:  
\* No competition exists
4. Demand curve: Steep
5. Price control:  
\* Price is controlled by the seller.

### Monopolistic Competition

- Many sellers try to capture the market share by differentiating their products.
- No. of player : Many
- Degree of competition,  
\* A very high competition exists.
- Demand curve: Flat
- Price control ;  
\* Price control is exercised by buyers, as many sellers are available.



- Perfect competition occurs when all companies sell identical products, market share does not influence price, companies are able to enter or exit without barriers, buyers have perfect or full information, and company can not determine prices
- Opposite to imperfect competition.
- It is a market that is entirely influenced by market forces.

Characteristics of perfect competition:

- There are a large number of firms in the market
- Firms in the market sell an identical product
- Firms are price takers.
- No monopolies.
- Buyer have complete information about the product

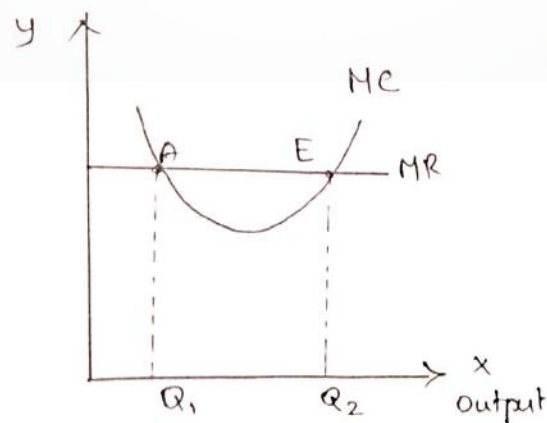
Example: for perfect competitions.

- x Large no. of buyers.
- x Large no. of sellers.

## Equilibrium under perfect competition,

- Marginal cost (MC) is equal to price for attaining equilibrium in the market situation.
- Perfect competition is a type of market where there are huge no. of buyers and sellers who deal in the same type of products due to which no individual unit is able to influence the price of the product.
- so, Marginal revenue or Average revenue } =  $\frac{\text{Total Sales}}{\text{Quantity}}$
- Therefore, under perfect competition marginal revenue, Average revenue and the price remains the same throughout.

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E = Equilibrium.

MC = MR @ point A

Beyond A, not equilibrium,  
 $MC < MR$

- A firm is in equilibrium, (i.e) maximizes profit when it produces that quantity of output at which;

(i)  $MC = MR$

(ii) MC becomes greater than

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## Macro economics.

National Income and its Components - GNP, NNP, GDP, NDP. Consumption Function; Investments; Simple Keynesian model of income determination and the Keynesian multiplier; Government sector - Taxes and Subsidies; External sector - Exports and imports; Money - Definition; Demand for money transactions and speculative Demand; Supply of money - Bank credit creation multiplier; Integrating money and commodity markets - IS, LM model

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## National Income - Basics.

- National Income is the final outcome or the end result of all economic activities of a nation.
- Economic activities generates two kind of flows in a modern economy i) Money flow, ii) Product flow.
- Money flows in exchange for services of factors of production in the form of wages, rent, interest and profits, known as factor earnings.
- Product flows are flow of goods & services.



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- on the basis of these two kind of flows, national income concept may be broadly divided into (i) concepts related to money flows  
(ii) concept related to product flows.

### Money flows:

- National income is the money value of the end results of all economic activities of the nation.
- Economic activities generate a large number of goods and services, and make net addition to the national stock of capital.
- These together ~~constitute~~ constitute the national income of a 'closed economy' which has no economic transaction with the rest of the world.
- In 'open economy', national income includes also the net results of its transactions with the rest of the world.
- All human activities which create goods and services that can be valued at market price are broadly the economic activities. It includes production by farmers; production by firms; Production by other kinds, bank, organization etc
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→ Non-economic activities are those which produce goods and services that do not have economic value.

→ Non-economic activities include psychological, social, & political services.

Product flow:

→ While economic activities generate flow of goods and services on the one hand, they generate money-flows, on the other, in the form of factor payments - wages, interest, rent, profits and earnings of self-employment.

→ Thus, national income may also be obtained by adding the factor earnings and adjusting the sum for indirect taxes and subsidies.

→ The concept of national income is linked to the society. It differs fundamentally from the concept of private income.

→ National income refers to the money value of the entire economic activities of the country. It is not true of the private income.

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Example: for national income:

→ Employer's contribution to the social security and welfare funds for the benefit of employees.

Examples for private income:

→ Interest on loan

→ Pensions.

→ Social security benefits.

Gross National Product (GNP)

→ GNP is the most important and widely used measure the national income.

→ GNP is defined as the value of all final goods and services produced during a specific period, usually one year.

→ GNP is estimated on the basis of product flows.

→ GNI (Gross national income) is estimated on the basis of money income flows, (wages, profits, interest etc),



→ Gross National Product (GNP), it includes GDP, income earned by residents from overseas investments, minus income earned by foreign residents.

→ GNP, total market value of the final goods and services produced by a nation's economy during a specific period of time usually a year, computed before allowance is made for the depreciation.

What is GNP and GDP?

→ Gross Domestic product (GDP) is the value of the finished domestic goods and services produced within a nation borders.

→ on other hand, gross national product (GNP) is the value of all finished goods & services owned by a country citizens, whether or not those goods are produced in that country.

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How GNP is calculated?

→ Gross National product is commonly calculated by taking the sum of personal consumption expenditures, private domestic investment, government expenditure, net exports, and any income earned by residents from overseas investments, then subtracting income earned by foreign residents.

What is the difference between GDP and GNP?

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GDP

GNP.

EnggTree.com

1. Local Scale

2. Goods and services that are being produced outside the economy are excluded

3. It highlights the strength of the country's economy

4. Definition: The value of goods & services produced within the geographical boundaries of a nation in a financial year is termed as GDP

International Scale

The goods and services that are produced by the foreigners living in the country are excluded.

It highlights the contribution of the residents to the development of the economy.

Definition: The value of goods & services produced by the citizens of a nation irrespective of the geographic limits is known as GNP

How do you calculate GDP from GNP?

$$* \text{GDP} = \text{Consumption} + \text{Investments} + (\text{Govt. Spending}) + (\text{Exports} - \text{Imports})$$

$$* \text{GNP} = \text{GDP} + \text{NR} (\text{Net income inflow from assets abroad}) - \text{NP} (\text{Net payment outflow to foreign assets})$$

What will happen if GDP is greater than

GNP?

→ Net factor income earned abroad is negative

Gross Domestic Product (GDP)

→ It is based on domestic income only.

→ Income received from abroad is not considered here.

→ GDP at market price = GNP at market price - payment received from abroad - payment made to abroad.



Net National ~~EnggTree.com~~ (NNP),

→ It is defined as GNP less depreciations.

$$NNP = GNP - \text{Depreciations.}$$

→ Depreciation is that of total productive assets which is used to replace the capital worn out in the process of creating GNP.

→ NNP refers to gross national product. (i.e.) the total market value of all final goods & service produced by the factors of production of a country during a given time period, minus depreciation.

To further Understand:

→ GNP included what is produced domestically and what is produced by domestic labor and business abroad in a year.

→ National income includes all income earned; wages, profits, rent, profit income.

$$\underline{NNP} = GNP - \text{Depreciation.}$$

Net Domestic Product (NDP),

→ It is the excess of GDP over above depreciations.

$$NDP = GDP - \text{Depreciation}$$

→ NDP (Net domestic product) equals the gross domestic product minus depreciation on a country capital goods.

→ Decrease in value of fixed assets.

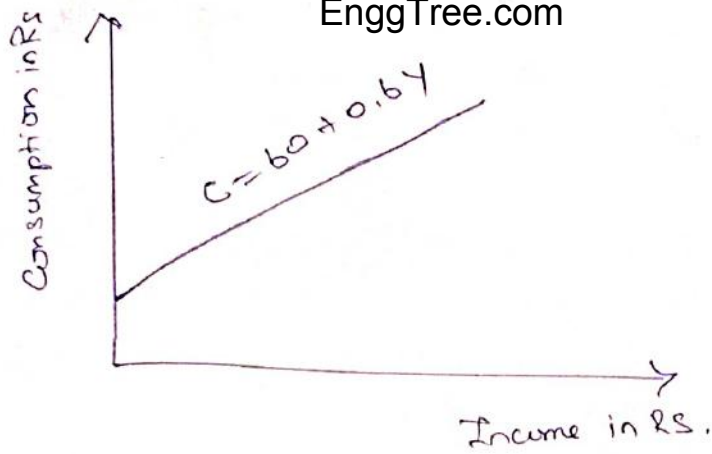
Ex: computer, building, transport equipment, machinery etc.

Consumption function:

→ In economics, relationship between consumer spending and the various factors determining it.

→ At the household or family level, these factors may include income, wealth, expectations about the level and riskiness of future income or wealth, interest rate, age, education, & family size.

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→ The consumption function refers to the standard equation of consumption which defines the relationship between consumption and income where consumption value can be derived at each level with the use of income value.

Investments:

→ An investment is an asset or item acquired with the goal of generating income or appreciation.

→ Appreciation refers to an increase in the value of an asset over time.

→ When an individual purchases a good as an investment, the intent is not to consume the good but rather to use it in the future to create wealth.



## Types of investments

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- Stocks
- Bond
- Mutual fund
- Bank products.
- Savings for education etc

## Simple Keynesian model of income determination

- According to Keynesian model, the equilibrium level of national income is determined at a point where the aggregate demand curve intersects the aggregate supply curve
- The aggregate income is always equal to consumption and savings.

$$\text{Aggregate income} = \text{Consumption (C)} + \text{Savings (S)}$$

## Different models:

### models for income Determination

Two Sector  
model



Household +  
Business only

Three Sector  
model



Household (HH)  
+  
Business (B)  
+  
Government (G)

Four Sector  
model



HH + B + G  
+  
Foreign  
Sector

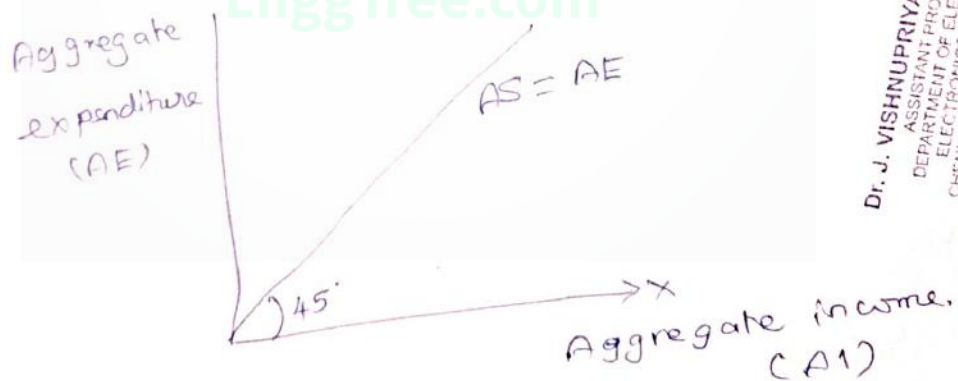
## Aggregate Supply (AS)

→ AS can be defined as total value of goods and service produced and supplied at a particular point-of time.

→ It comprises consumer goods as well as producer goods.

→ When goods and services produced at a particular point of time is multiplied by the respective price of goods and services, it provides the national output.

→ The correlation between income and expenditure is represented by an angle of  $45^\circ$ .



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→ According to Keynes theory of national income determination, the aggregate income is always equal to consumption & savings.

$$\text{Aggregate income} = \text{Consumption (C)} + \text{Savings (S)}$$

→ AD refers to the effective demand that is equal to the actual expenditure.

→ Aggregate effective demand refers to the aggregate expenditure of an economy in a specific time frame.

→ AD involves two concepts, namely 'AD' for consumer goods or consumptions (C) and aggregate demand for capital goods

(or) Investments (I).

$$\therefore AD = C + I$$

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→ According to Keynes theory of national income determination, in short-run investments (I) remain constant throughout AD schedule, while consumption (C) keeps on changing.  $\therefore$  consumption (C) acts as the major determinant (or) function of income (Y)

$$C = a + by,$$

By sub AD value,

$$AD = [a + by] + I$$

a - constant (exp.

consumption when income zero).

b - Proportion of income consumed

$$\left( \frac{\Delta C}{\Delta Y} \right)$$



- It is theory that states the economy will flourish the more the government spends,
- According to the theory, the net effect is greater than dollar amount spent by the government.

→ Critics of this theory state that it ignores how government finance spending by taxation or through debt issues.

What is the multiplier equal to in the Keynesian model?

- The multiplier tells us how much increase in ~~income~~ income occurs when autonomous ~~investments~~ investments increases by Rs. 1

→ That is, investment multiplier  $\frac{\Delta Y}{\Delta I}$  is

and its value is equal to  $\frac{1}{1-b}$  where

$b$  - stands for marginal propensity to consume

EnggTree.com  
How is Keynesian tax multiplier calculated.

→ It is calculated as  $MSP = \frac{\Delta C}{\Delta Y}$

→ Suppose an individual receives a year end bonus of \$600 and spends \$300 on goods and services. The MPS is  $\frac{(600-300)}{600} = 0.5$ .

Government sector; (or) Public sector

→ Public sector is the part of the economy composed of both public services and public enterprises.

→ Public sector organisation are owned, controlled and managed by the Government.

→ Private sector are owned, controlled and managed by individual or group etc.

Government Sectors

→ Defence.

→ Education

→ Health and Human services.

→ Security and Justice.

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## EnggTree.com Pros and Cons of Public Sector:

### Pros (or) Advantages:

- Job security
- Higher Salaries.
- working hours
- Training
- changing Jobs.
- Diversity

Taxes & Government Revenue.  
→ collecting taxes and fees is a fundamental way of generating public revenues that makes it possible to ~~finance~~ finance investments in human capital.

→ Tax reform will allow the government to invest in the Filipino people through infrastructure, education, health, housing and social protection.

→ Following taxes collected by the Government.

- \* Income tax
- \* Wealth tax
- \* Gift tax
- \* Corporate tax
- \* Transaction tax
- \* Capital gain tax
- \* Sales tax
- \* Property tax
- \* Estate tax



## Subsidies:

EnggTree.com

- Subsidies are payments, tax breaks, or other forms of economic support given by Government to certain industries or economic sectors.
- Subsidies are a payment from Government to private entities, usually to ensure firms to stay in business & protect jobs.

## Examples:

- Agriculture.
- Electric car.
- welfare payments.
- Green Energy
- Transport

→ Basically subsidies are provided by Government to specific industries with the aim of keeping the prices of products and services low for people to be able to afford them and also to encourage production & consumption.

→ The effect of a subsidy is to shift the supply or demand curves to the right.  
[ leads to increase in supply or demand ]

## External Sectors, EnggTree.com

- The external sector is the portion of a country's economy that interacts with the economies of other countries.
- In the Goods market, the external sector involves exports & imports.

### India's External Sectors:

- Trade
- Forex investment
- Budget deficits,
- Balance of Payment
- Current account
- Other economic operation in foreign currency
- Exporting refers to the selling of goods and services from the home country to a foreign nation
- Whereas, importing refers to the purchase of foreign products and bringing them into one's home country.

## Money - Definition EnggTree.com

→ ~~Money~~ Money is a commodity accepted by General consent as a medium of economic exchange

→ It is the medium in which price & value are expressed,

→ It circulates from person to person & country to country & it is the measure of wealth.

→ Money is an accepted or authorized medium of exchange.

### ① Demand for money transactions

→ People need money on a regular basis to pay bills and finance their discretionary consumptions.

→ A precautionary reason, as an unexpected need, can often arise;

→ A speculative reason, if they expect the value of such money to increase versus other asset classes.



## Speculative Demand,

→ Money held for speculative reasons is also known as the portfolio demand for money.

→ If prices decline, the money stored today will be more valuable tomorrow.

→ When people want to speculate on changes in currency rates. For example, if

Somebody expects its domestic currency to depreciate significantly against a foreign currency. They can buy the foreign currency and store it and wait for its appreciation against domestic currency, the strategy is known as hedging.

## Supply of money:

→ In ~~macro~~ macroeconomics, the money supply refers to the total value of currency held by the public at a particular point of time.

EnggTree.com  
→ The money supply is the total amount of money cash, coins, and balance in bank account in circulation.

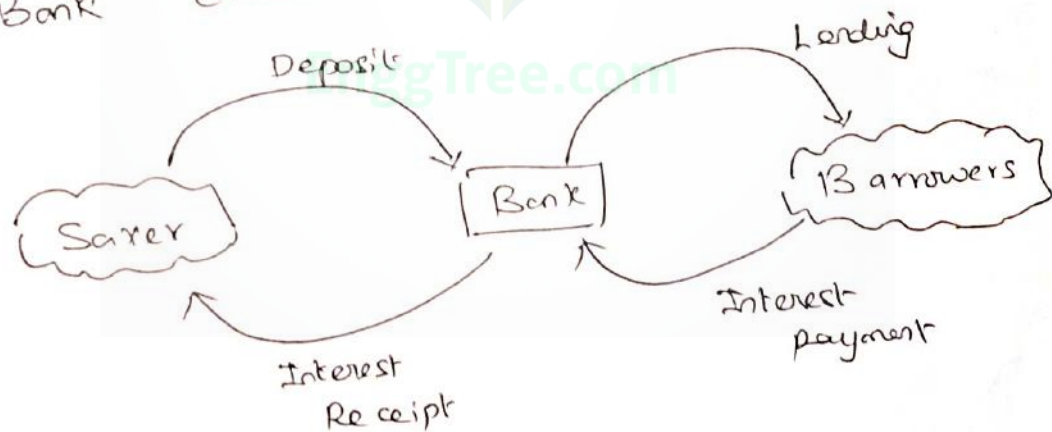
→ RBI is the main supply of money

→ RBI monitors the money supply in the economy and has power to print and issue currency.

→ Formula for money supply:

$$\text{Money Supply (MS)} = \text{Reserves} \times \text{money multiplier}$$

Bank Credit creation multiplier:



Credit multiplier:

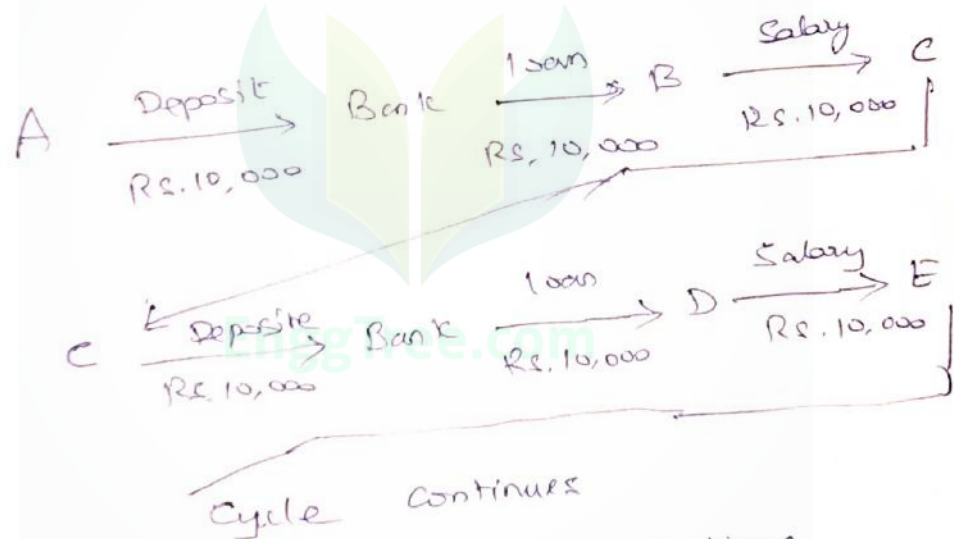
→ Given a certain amount of cash, a bank can create multiple times credit.

→ In the process of multiple credit creation, the total amount of derivation deposits

that a bank ~~creates~~ is a multiple of the initial cash reserves.

Example 1 (Assume no reserve case)

→ Suppose 'A' deposits money in Bank of Rs. 10,000, Bank gives this money of 10,000 as loan to 'B' (No reserve) with this loan money, this person gives salary or pays other ~~se~~ expenses to 'C'. This money again gets deposited in Bank and cycle continues.



→ In this way, cycle will continue

Concept of money multiplier:

→ It is the ratio of Deposits created over initial Deposits.

→ Formula: Money multiplier =  $\frac{\text{Deposit created}}{\text{Initial Deposits}}$



→ Suppose initial deposit is of Rs. 10,000  
& Reserve is 20%.

Deposit	Reserve	Loan
10,000	2,000	8,000
8,000	1,600	6,400
6,400	1,280	5,120
5,120	1,024	4,096
4,096	819	3,277
Total 50,000	10,000	40,000

↓  
This reserve become equal  
to initial deposit.

Process of money  
creation

→ With the initial deposit of Rs. 10,000  
Bank were able to generate the total  
deposit of 50,000 rupees.

→ More deposit means more money. This  
is how bank help in process of money  
creation.

Process of credit creation:

- Credit means loan given by bank with initial deposit of 10,000.
- Bank were able to give total credit (loan) of Rs. 40,000. This is how bank help in process of credit creation.

Shortcut formula to calculate Money multiplier:

- Money multiplier depends upon legal Reserve Ratio.

$$\rightarrow \text{Money multiplier} = \frac{1}{\text{Legal Reserve Ratio}}$$

Example 1

Initial Deposit 10,000

~~Initial~~ Legal Reserve Ratio 20%.

$$\begin{aligned} \text{Money multiplier} &= \frac{1}{\text{Legal reserve ratio}} \\ &= \frac{1}{20\%} = 5 \end{aligned}$$

It means,

Initial Deposit = 10,000

Money multiplier : 5

Deposit created : 50,000

Example 2

Initial Deposit 10,000

Legal Reserve ratio 25%.

$$\begin{aligned} \text{Money multiplier} &= \frac{1}{\text{Legal reserve ratio}} \\ &= \frac{1}{25\%} = 4. \end{aligned}$$

It means,

Initial Deposit : 10,000

Money multiplier : 4

Deposit created : 40,000

→ More the legal reserve ratio, less deposits created, Hence less money generated in economy.

### Components of Bank Balance sheet

Liabilities (Everything the Bank owes to other people).

Assets, (What the Bank owns),

1. Capital

1. Cash & Balance with RBI

2. Reserve & Surplus,

2. Investments

3. Deposit

3. Fixed Assets,

4. Borrowings,

4. Advances,

~~5. loan to~~

~~5. Savings account~~

5. Savings account

~~6. own fund~~

6. own fund,

~~7. liabilities from central bank~~

7. liabilities from central Bank.

5. loan to non-Bank

6. loan to central Bank

### Integrating money and commodity market:

→ Money market is a part of financial market where short term borrowings can be issued, this kind of market includes assets that deal with short term borrowings, lending, buying & selling.

→ whereas, commodity market is a physical, ~~setting~~ or virtual market place for buying, selling and trading raw or primary products.



## IS-LM model EnggTree.com CK1 - Hansen model

- The IS-LM curve model emphasises the interaction between the goods and money markets.
- The goods market is in equilibrium when aggregate demand is equal to income.
- The aggregate demand is determined by consumption demand and investment demand.

What is IS-LM model?

- The IS-LM model, which stands for "Investment Savings (IS) and Liquidity Preference money Supply (LM)" is a Keynesian macroeconomics model. That shows how the market for economic goods (IS) interacts with the loanable funds market (LM) or money markets.

- The LM equation calculates the demand for money, and the equation is,

$$L = K \times Y - h \times \dot{i} \quad \dot{i} - \text{interest}$$

L - Demand for real money

Y = income

K - income sensitivity of Demand for real money

h - interest sensitivity of Demand for Real money

What is LM? EnggTree.com

→ In macroeconomics, LM refers to the liquidity of money (LM).

→ As interest rates increase, the demand for money decreases.

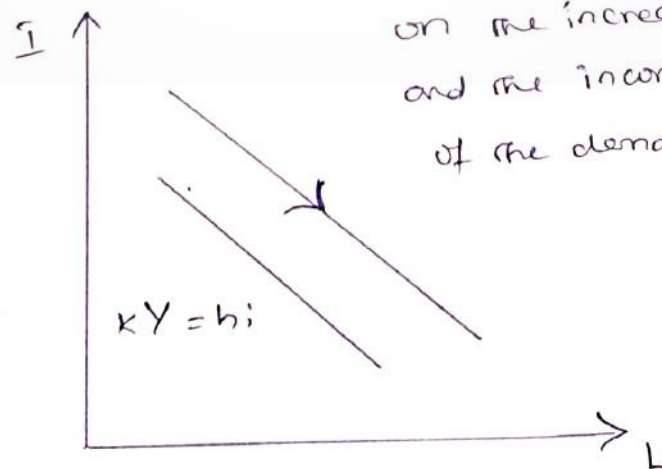
→ LM is really part of a large model, the IS-LM model, where IS-LM stands for Investment Savings - Liquidity Preference money supply.

→ These large words are basically just used to model money and income in an economy.

→ The models are used to define points of equilibrium, or balance; in other words, intersecting values where the demanded money equals the amount available to invest.

→ The size of the shift depends on the increase in income and the income sensitivity of the demand of money.

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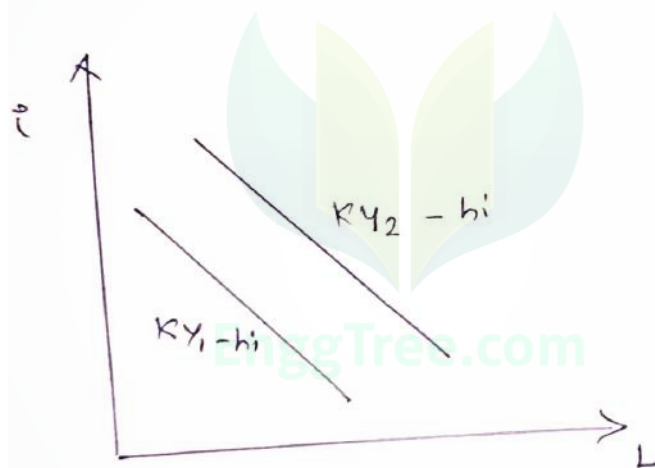
→ Demand for money also depends on income.

The more you make, the more you spend or save in offshore accounts.

→ The LM equation can be used to create a straight line, much as the standard math formula ( $y = mx + b$ ).

→ Put the interest rate on the y-axis, since this is the independent variable; and put  $L$  on the x-axis, since this is the demand for money.

→ When interest rates go down, so does the demand for money.



→ As national income increases, the demand curve shifts upward and outward, towards  $L$  on the graph.

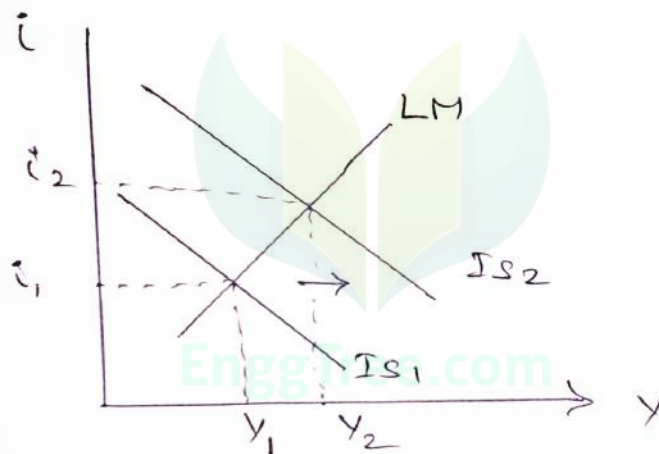
→ The size of the shift depends on the increase in income and the income sensitivity of the demand for money.



IS - LM model,

→ It shows the relationship between interest rates and assets market. Also known as real output in goods and service market + money market.

→ The intersection of the investment-savings (IS) and liquidity preference money supply (LM) curves model, General equilibrium.



→ The 'IS' curve moves to right, causing higher interest rates ( $i$ )

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Business cycles and stabilization.

Monetary and fiscal policy - central Bank and the Government; the classical paradigm - Price and wage rigidities - voluntary and involuntary unemployment.

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## Monetary Policy:

- Monetary Policy is the policy adopted by the monetary authority of a nation to control either the interest rate payable for very short term borrowing or money supply, often as an attempt to reduce inflation or the interest rate, to ensure price stability and stability of nation's currency.
- Monetary policy is a modification of the supply of money i.e. 'Printing more money' or decreasing the money supply by changing interest rate or removing excess reserves.
- the purpose of monetary policy are usually to stabilize the gross domestic product, to achieve and ~~to~~ maintain low unemployment.

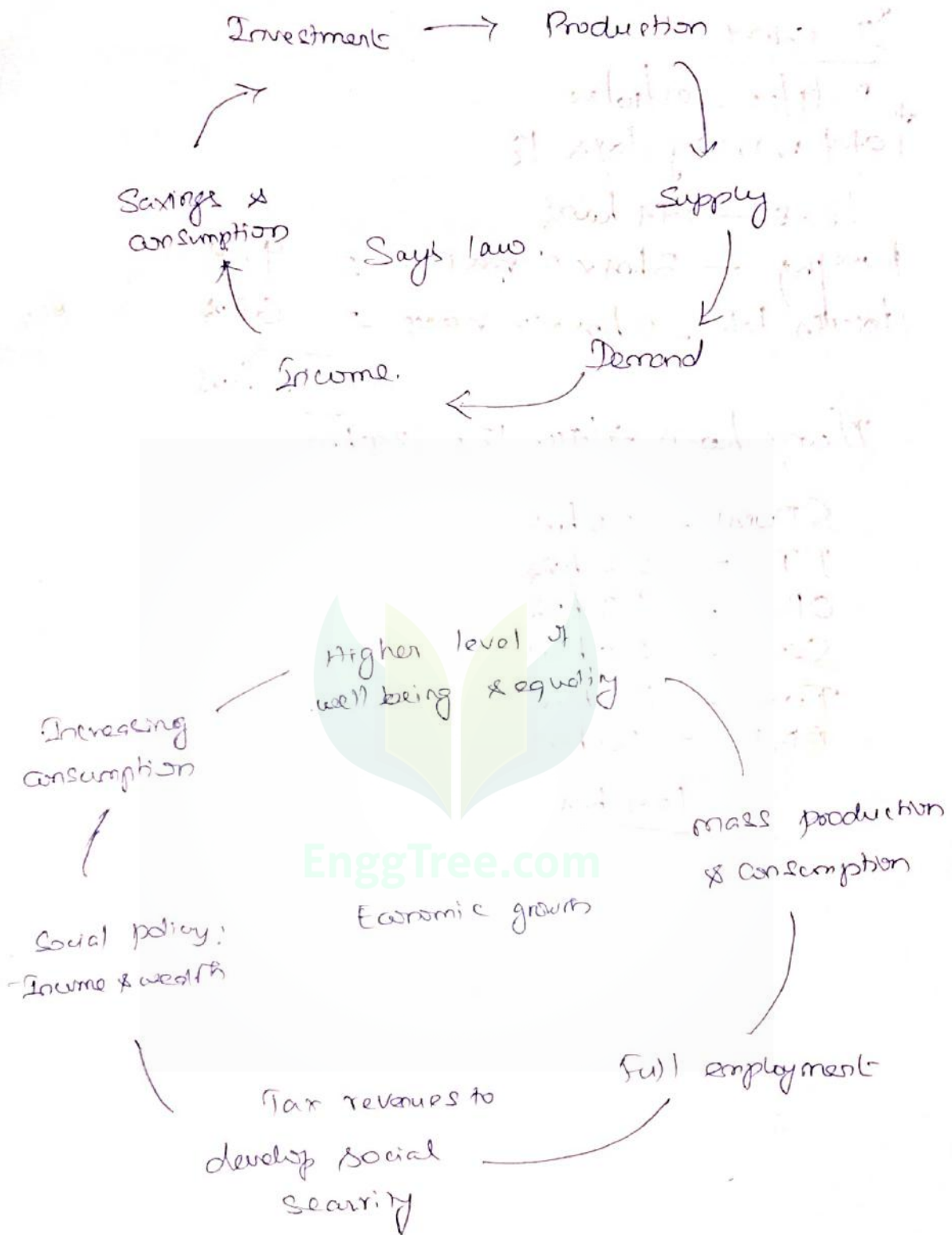
- Momentary <sup>EnggTree.com</sup> referred to as being either expansionary or contractionary
- Expansionary policy — It is used to reduce the unemployment during recession by decreasing interest rates.
- Contractionary policy — maintains short term interest rates greater than usual, slows the rate of growth of the money supply. Contractionary policy can result in increased unemployment.

### Fiscal Policy:

- In economics and political science, fiscal policy is the use of government revenue collection (taxes or tax cuts) and expenditure to influence a country's economy.
- Fiscal policy deals with taxation and government spending and is often administered by a government department; while monetary policy deals with money supply, interest rates and is often administered by country's central bank (RBI).

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## Tools used in monetary policy

- Repo rate
- Reverse Repo rate
- open market operations
- Bank rate policy (discount rate)
- Cash Reserve Ratio (CRR)
- Statutory Liquidity Ratio (SLR)

### What is repo rate?

- Repo [or] Repurchase option rate is a means of short term borrowing, wherein banks sell approved government securities to RBI and get funds in exchange.
- In other words, in a repo transaction, RBI repurchases government securities from Bank, depending on the level of money supply it decides to maintain in the country's monetary system.
- In India Repo rate @ 2022 is

5.9 %

## Difference - Repo rate & Reserve Repo rate.

Repo rate	Reserve Repo rate
→ The repo rate is the rate at which commercial bank by selling their assets	→ Reserve Repo rate is the rate at which the country's central Bank (RBI) borrows money from commercial banks.

## Open-market Operations (OMO)

→ OMO is the term refers to the purchase and sales of securities in the open market by Federal Reserve or Central Bank or RBI

## Bank Rate policy (Discount rate)

→ The rate charged on the loans offered by the central Bank to commercial bankers without any collateral.



## Cash Reserve EnggTree.com (CRR)

- CRR is the percentage of Bank's total deposits that it needs to maintain as liquid cash.
- Central Bank regulations that sets the minimum amount that a commercial Bank must hold in liquid assets.
- CRR is a reserve maintained by Banks with the RBI. It is a percentage of the Bank's deposits maintained in cash form.

## Statutory Liquidity Ratio (SLR)

- SLR is an obligatory reserve that commercial Banks must maintain themselves.
- SLR is the minimum percentage of deposits that the commercial bank maintains through Gold, Cash and ~~other assets~~ other securities.

## Tools for fiscal policy:

→ Taxes.

→ Govt. Spending.

\* Private investment is not a tool for fiscal policy.

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### Govt. Spending tools:

→ Capital expenditure: It refers to what a govt. spends on amenities such as schools, roads, and hospitals.

This spending adds to a country's capital stock.

→ Current Govt Spending: It refers to goods and services, which it regularly provides. Ex: Defense, health & Education. This aims to improve labour productivity.

### Govt. Revenue Tools

→ Indirect taxes: It is imposed on specific goods such as cigarettes, alcohol, fuel & services.

Ex: VAT - Value Added Taxes.

→ Direct Taxes: Taxes on profit, income, wealth are direct taxes.

Ex: National insurance tax, corporate taxes,

Difference between central Bank and commercial Bank.

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Basis	Central Bank	Commercial Bank.
Number	There is only one Central Bank in a country	The no. of Commercial Banks in a country
Status	Central Bank is an Apex institution of the money market	Commercial Banks are units which work under central Bank
Aim	To control & supervise monetary and banking system	To earn profit.
Ownership	owned by Govt	It may be Pvt or Govt.
Dealings	Central Bank does not deal with public	It deals with public
Issuing currency	Monopoly to issue currency	Not authorised to issue currency
Branch	Situated within country	May be situated in abroad.

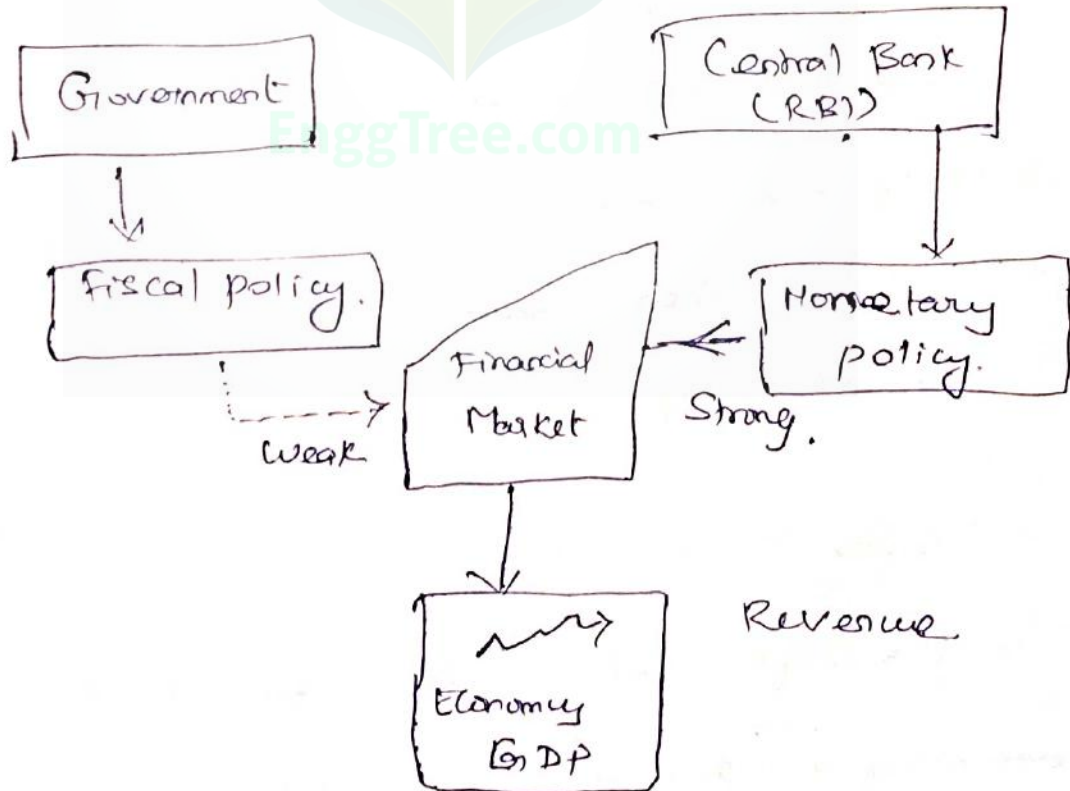


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## Relationship between Central Bank and the Government.

### Role of Central Bank :

- Issue money (Notes & coins)
- Ensure stability of banking system
- Monetary policy (set interest rates)
- Lender of last resort to govt.
- Lender of last resort to commercial Banks.



## Price and wage rigidities:

→ Normal rigidity, also known as price-stickiness or wage stickiness, is a situation in which a normal price is resistant to change.

→ In macroeconomics, rigidities are real prices and wages that fail to adjust to the level indicated by equilibrium or if something holds one price or wage fixed to a relative value of another.

\* Relationship between price & wages:

→ when workers receive a wage hike, they demand more goods and services, this in turn, causes prices to rise.

→ wages rigidity: The observation that wages cannot be adjusted downward - has important implications for labour market and macroeconomic performance.

→ Price rigidity: It is ~~the~~ a price of a product fixed after deliberations and negotiations by the oligopolistic firms, to which they generally stick with a view to avoid any sort of price war.

→ Oligopolistic competition: A competitive situation in which there are only few sellers (of product that can be differentiated but not to any great extent); each seller has a high percentage of the market and can not afford to ignore the actions of others.

\* Why are prices rigidity under oligopoly

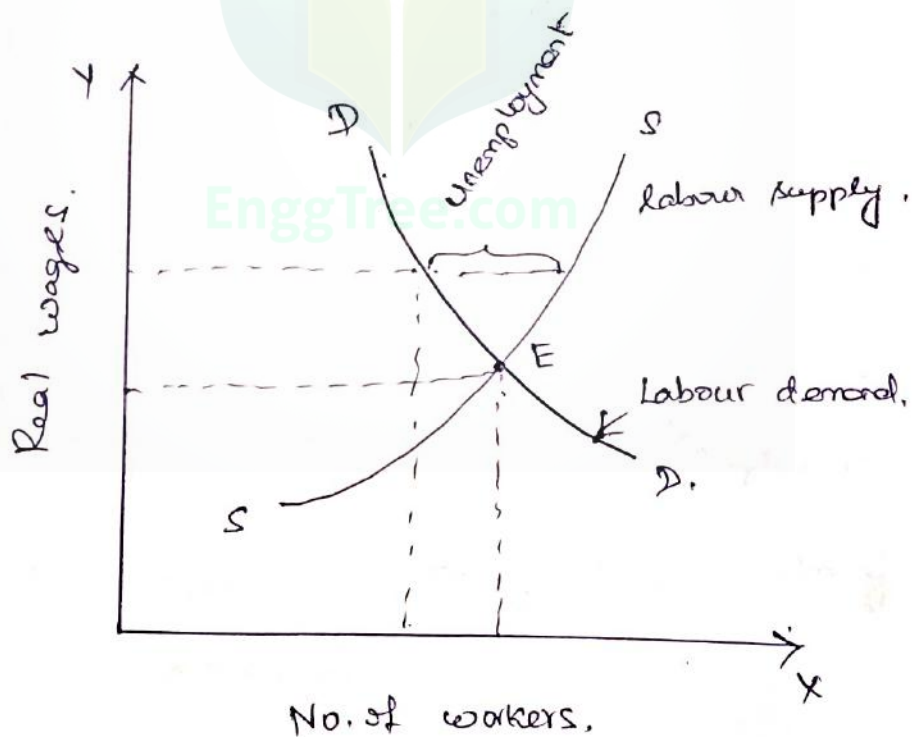
→ A firm can not gain or lose by changing its price from the prevailing price in the market. In this case, there is no increase in demand for firm which changes its price. Hence, firm stick to the same price over time.



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## How wage rigidity give rise wait . unemployment in the economy?

- wage rigidity implies that the wages fail to adjust until demand for labour become equal to the supply to labour
- wage rigidity arises because sometimes the wages are not flexible and the real wages are fixed above the equilibrium level. This results in unemployment.



Panel.

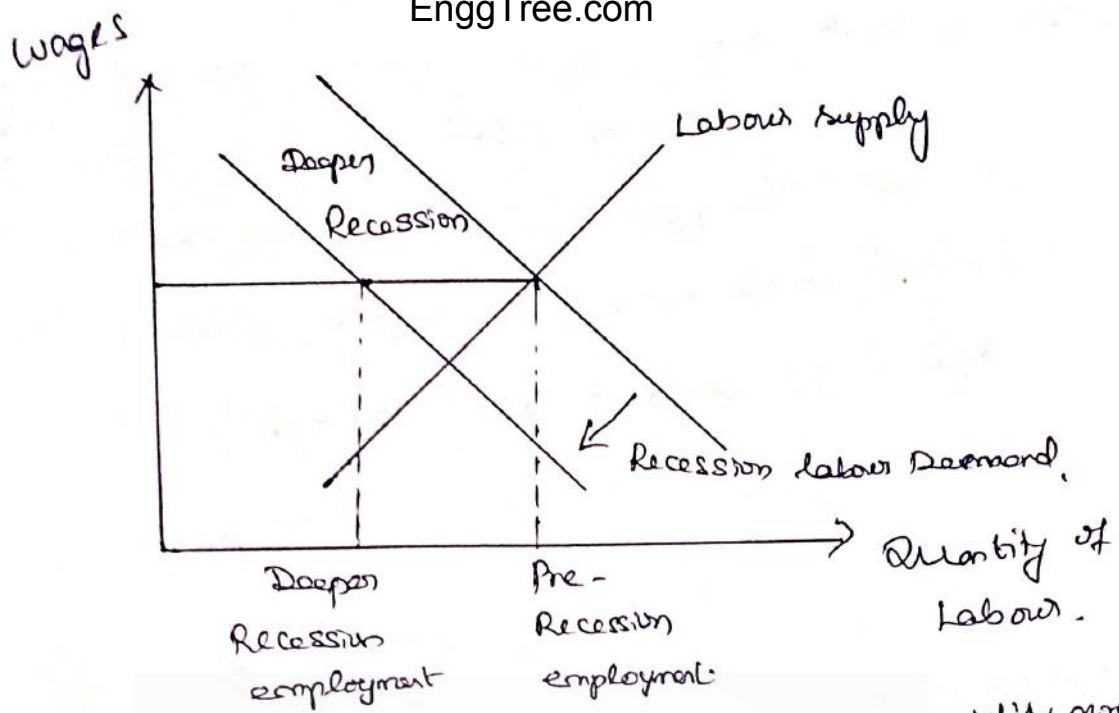


Fig: Keynes' money - wages rigidity model.

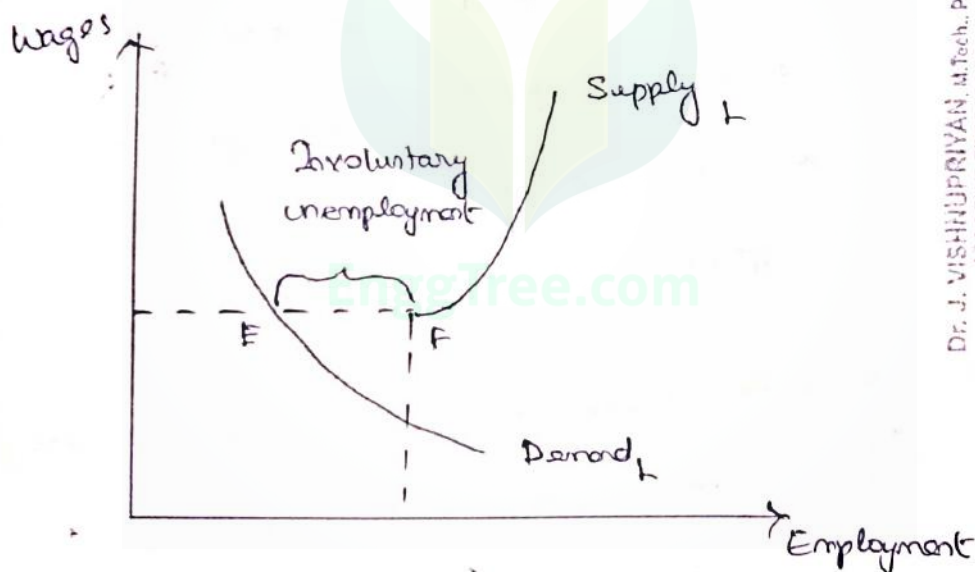


Fig: Keynesian theory of involuntary unemployment

Price / wage rigidity:

→ Presence of wage contracts between firms and labour union which usually fixes wage rate over the duration of wage contract creates an important reason for the wage rigidity.

→ In other words, even when demand for their output falls and firms lower their output, they may not be able to reduce wages or even form labour force due to the presence of wage contracts.

### Voluntary unemployment;

→ In this situation in which someone chooses to not work, either because they will not take a job with low pay, or they are satisfied with the amount they receive from the government in benefits while not working.

→ In other words, a person refuses to work because their reservation wage is higher than the prevailing wages.

### In Voluntary unemployment:

→ A person is unemployed despite being willing to work at the prevailing wages.



What is voluntary unemployment class 12

→ Unemployment of those person who are not willing to do work although suitable work is available for them.

Why are people voluntarily unemployed

→ Some times people reject employment opportunities if they do not receive desired wages or if they are not offered the kind of work they wish to do.

What are the causes of unemployment:

- Mismatch of skills in the labour market
- Occupational immobilities.
- Geographical immobilities.
- Technological change.
- Structural change in economy.

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What are the effects of unemployment?

- lower economic growth (GDP)
- As fewer people have jobs, firms won't be able to produce as many goods and services.  
As a result, the output goods and services in the economy, GDP, will be lower.

How do solve voluntary ~~un~~ unemployment?

- It can be reduced by increasing incentives

Major reasons for youth unemployment.

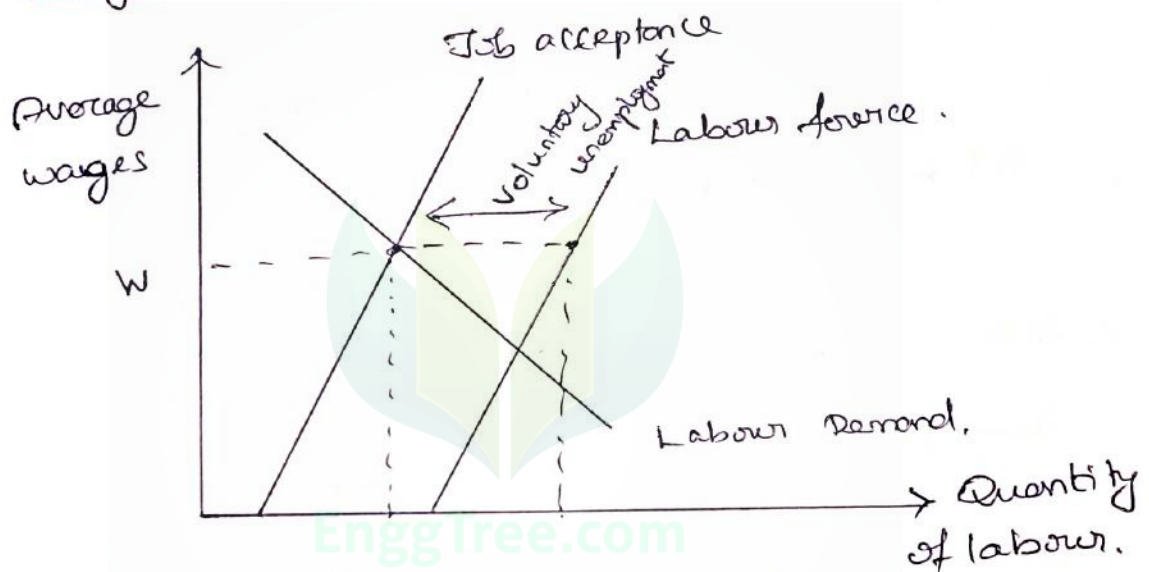
- Higher number in education
- Lowest level of relevant job skills.
- Lack of communication.
- No adjustment in the work.

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## Types of unemployment:

- Frictional unemployment
- cyclical unemployment
- Structural unemployment
- Institutional unemployment.

## Diagram for Voluntary unemployment



- Labour force - It refers to the total supply of labour.
- Job acceptance - It refers to the workers who are preferred to accept work at the going wage rate.
- The gap between two curves represents voluntary unemployment.



Frictional unemployment:

- It is a type of short-term unemployment.
- It happens when a person is voluntarily job searching or searching a new career.
- It is not a bad thing.

Cyclical unemployment:

- It related to cyclical trends in industry.
- Example! construction workers were laid off during recession period.

Structural unemployment:

- When workers experience unemployment for a long period of time as a result of structural changes in an economy and its labour force.
- It happens when the massive changes in the industry.

## Institutional unemployment:

→ Restrictive licensing laws, discriminatory hiring or high rates of ~~the~~ unionization, it can lead to institutional unemployment



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