

* Economics:

- Microeconomics :
 - 1) Study of economics at an individual level, group or company level, e.g.: consumer shop, small business.
 - 2) Affects individuals and companies.
 - 3) Analyses the partial behaviour of economy.
 - 4) Scope \rightarrow less.
 - 5) Classical economists support this economics.
- Macroeconomics :
 - 1) Study of national economy as a whole, e.g.: national income, unemployment rates.
 - 2) Issues that affect whole economy.
 - 3) Analyses entire behaviour of economy.
 - 4) Scope is more.
 - 5) Modern economists support this economy.
- Economics :
 - Study of how society uses its limited resources.
 - Social Science that deals with the production, distribution and consumption of goods and services.
 - Term 'economics' derived from Greek word 'Oikonomia' meaning 'household management'.

* Law of Demand:

- Quantity of a good/product that the consumer is willing to buy and able to buy \rightarrow Demand (will + able to buy).
- Latent Demand -
 - (i) does not have enough money.
 - (ii) item is not available.
 - (iii) consumer does not know that the service is available.

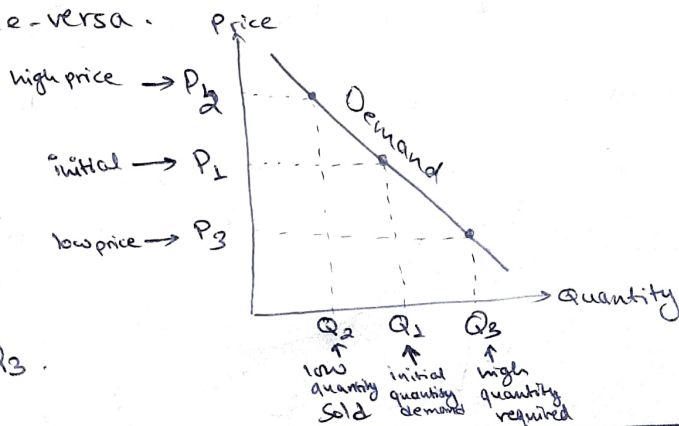
• Law of Demand:

quantity $\propto \frac{1}{\text{price}}$ (quantity & price relation)

As the price of a good falls, then the quantity demand will rise and vice-versa. Price

When price increases from P_1 to P_2 , the demand decreases from Q_1 to Q_2 .

When price decreases from P_1 to P_3 , the demand increases from Q_1 to Q_3 .



* Exception to the Law of Demand:

- 1) Giffen goods: Inferior goods whose demand increases with the increase in prices.
- 2) Veblen Goods: Proposed concept of 'conspicuous consumption'. Many people who measure the commodity purely by its price, i.e., 'higher priced goods have more prestige value'.
- 3) Ignorance & Illusion of Buyers/customers: 'higher priced good is better in quality'.
- 4) Emergency like war, flood, earthquake etc.: Due to shortage, people will buy even for overpriced to store.
- 5) Necessities of life: petrol, even if price rises, people will still buy. Same for basic needs like salt, water, milk etc.

* Elasticity of Demand: The quantity of demand extends or contracts when the price changes.

$$1) \text{ PRICE elasticity of demand} = \frac{\% \text{ change in quantity demand}}{\% \text{ change in price}} = \frac{\% \Delta Q}{\% \Delta P} = \frac{\frac{\Delta Q}{Q_1}}{\frac{\Delta P}{P_1}} = \frac{\Delta Q}{\Delta P} \times \frac{P_1}{Q_1}$$

Price elasticity of demand can also be calculated by using mid-point method ~~or~~ arc elasticity of demand.

$$\text{Arc elasticity of demand} = \frac{(Q_2 - Q_1) \div [(Q_2 + Q_1) / 2]}{(P_2 - P_1) \div [(P_2 + P_1) / 2]}$$

if $E_d = \infty$, perfectly elastic demand curve

$E_d = 1$, unitary elastic D.C.

$E_d < 1$, inelastic D.C.

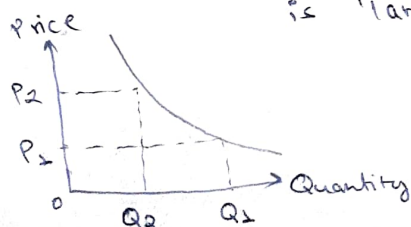
$E_d = 0$, perfectly inelastic D.C.

$E_d > 1$, Elastic demand Curve.

• Variation in price elasticity of demand.

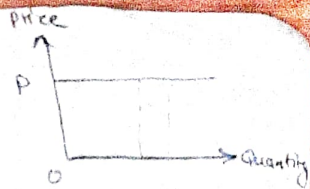
(i) Elastic demand: Δ quantity demanded due to a Δ price is 'large', i.e., $\Delta Q > \Delta P$

elasticity of demand > 1

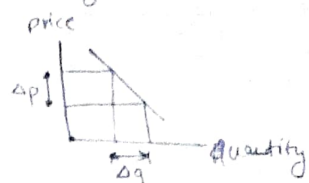


i.e., subtle change in price will have huge impact on demand

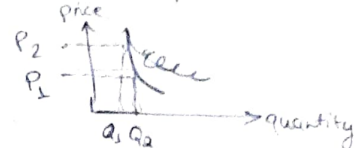
(i) Perfectly Elastic: quantity demand changes ∞ when there is even small change in price, $E_d = \infty$, $\Delta q \gg \Delta p$



(ii) Unit Elastic: quantity demand changes by the same % as the price.
 $E_d = 1$, $\Delta p = \Delta q$



(iii) Inelastic demand: Change in price is large, change in demand is small.
 $\Delta q < \Delta p$; $E_d < 1$



(iv) Perfectly inelastic demand: quantity demand is unaffected by any change in price
 $E_d = 0$; $\Delta q \ll \Delta p$ or, $\Delta q = 0$



• Total Revenue, $TR = P * q$. (price of good * quantity sold).

• Marginal Revenue, $MR = \frac{d TR}{d Q}$; calculated by dividing the change in total revenue by the change in output quantity.

addition of 1 unit

Marginal Revenue is defined as the increase in total revenue that results from the sale of 1 additional unit of output.

$$= \frac{d (P * q)}{d q} = p + q \frac{dp}{dq} = p \left[1 + \frac{dp}{dq} \left(\frac{q}{p} \right) \right]$$

$$= p \left[1 + \frac{1}{\text{price elasticity of demand}} \right]$$

• Average Revenue, $AR = \frac{TR}{Q}$

2) Income elasticity of demand $= \frac{\% \text{ change in quantity demand}}{\% \text{ change in income}} = (i) \frac{\% \Delta q}{\% \Delta i}$

when consumer's income increases, he will buy more of that product and vice-versa.

$$= \frac{Q_{\text{new}} - Q_{\text{old}}}{Q_{\text{old}}} * \frac{I_{\text{old}}}{I_{\text{new}} - I_{\text{old}}}$$

(i) income elasticity of demand > 1 ; good \rightarrow luxury good; income elastic.

(ii) income elasticity of demand < 1 & > 0 ; good \rightarrow normal; income, inelastic.

(iii) income elasticity of demand < 0 ; good \rightarrow inferior; negatively income ~~elastic~~ inelastic

3) Cross price Elasticity of demand $= \frac{\% \Delta \text{quantity demand for good X}}{\% \Delta \text{price for good Y}}$

i.e., it measures change in quantity of good X due to change in price of the other good.

Such goods are either substitute of one another or complimentary to each other, meaning:-

substitute goods: if colgate's price increases, people will start buying pepsodine or oral-b.

Complimentary goods: If bread's price increases, demand for jam decreases along with demand for bread.

if, (i) $C > 0$, goods are substitutes,

(ii) $C = 0$, goods are independent

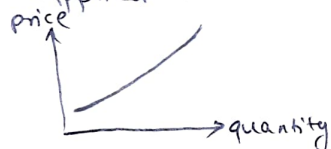
(iii) $C < 0$, goods are complementary

* Law of Supply:

• Supply: Willingness and ability of seller's or suppliers' to make available diff. possible quantities of goods at relevant prices.

• Law of Supply states the relationship between price and quantity of a supply of a good from suppliers' or producer's perspective.

When price \uparrow , quantity of goods supplied \uparrow .



• Determinants of Supply:

i) Cost: Cost \uparrow supply \downarrow & vice-versa.

ii) Price of commodity: Selling price \uparrow supply \uparrow

iii) No. of firms: people selling \uparrow supply \uparrow

iv) Taxation: Tax \uparrow cost \uparrow supply \downarrow

v) Technology: Advanced technology = supply \uparrow

vi) Future Expectation:

↳ if demand \uparrow in foreseeable future, then supply \uparrow .

↳ if future demand \downarrow , then supply \downarrow

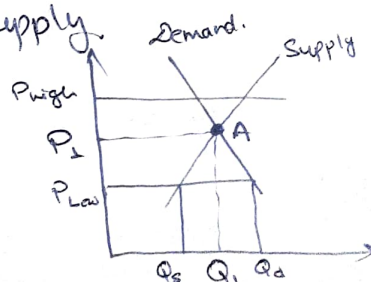
* Relation between demand and Supply.

case I:

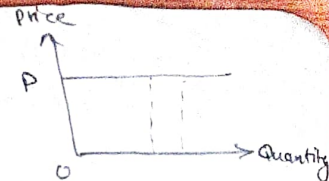
At Equilibrium Point A,

$$Q_d = Q_s.$$

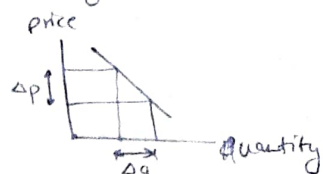
quantity of demand = quantity of supply.



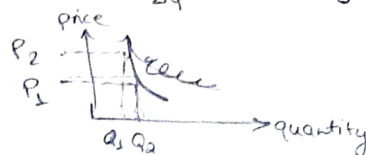
(ii) Perfectly Elastic: quantity demand changes ∞ when there is even small change in price, $E_d = \infty$, $\Delta q \gg \Delta p$



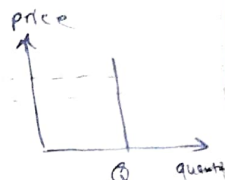
(iii) Unit Elastic: quantity demand changes by the same % as the price.
 $E_d = 1$, $\Delta p = \Delta q$



(iv) Inelastic demand: Change in price is large, change in demand is small.
 $\Delta q < \Delta p$; $E_d < 1$



(v) Perfectly inelastic demand: quantity demand is unaffected by any change in price
 $E_d = 0$; $\Delta q \ll \Delta p$
 or, $\Delta q = 0$



• Total Revenue, $TR = P * q$. (price of good * quantity sold).

• Marginal Revenue, $MR = \frac{d TR}{d Q}$; calculated by dividing the change in total revenue by the change in output quantity.

addition of 1 unit

Marginal Revenue is defined as the increase in total revenue that results from the sale of 1 additional unit of output.

$$= \frac{d (P * q)}{d q} = P + q \frac{d P}{d q} = P \left[1 + \frac{d P}{d q} \left(\frac{q}{P} \right) \right]$$

$$= P \left[1 + \frac{1}{\text{price elasticity of demand}} \right]$$

• Average Revenue, $AR = \frac{TR}{Q}$

2) Income elasticity of demand $= \frac{\% \text{ change in quantity demand}}{\% \text{ change in income}} = \frac{\% \Delta q}{\% \Delta i}$

when consumer's income increases, he will buy more of that product and vice-versa.

$$= \frac{Q_{\text{new}} - Q_{\text{old}}}{Q_{\text{old}}} \div \frac{I_{\text{new}} - I_{\text{old}}}{I_{\text{old}}}$$

- (i) income elasticity of demand > 1 ; good \rightarrow luxury good; income elastic.
- (ii) income elasticity of demand < 1 & > 0 ; good \rightarrow normal; income, inelastic.
- (iii) income elasticity of demand < 0 ; good \rightarrow inferior; negatively income ~~elastic~~ inelastic

3) Cross price Elasticity of demand $= \frac{\% \Delta \text{quantity demand for good X}}{\% \Delta \text{price for good Y}}$

i.e., it measures change in quantity of good X due to change in price of the other good.

Case II: P_{low} : $Q_s < Q_d$, then shortage. (excess demands) eventually leads to bidding against each other, raising the price.

Case III: P_{high} : $Q_d < Q_s$, then surplus (excess supply), eventually leads to customer attraction by shopkeepers by lowering the price.

* Elasticity of Supply:

It refers to the degree of responsiveness of quantity supplied due to change in price.

$$e = \frac{\% \text{ change in supply}}{\% \text{ change in price}} = \frac{\Delta Q_s / Q_s}{\Delta P / P}$$

same formula as elasticity of demand ($\frac{\Delta Q_d / Q_d}{\Delta P / P}$)

$e > 1$; elastic

$e < 1$; inelastic

$e = 0$; ~~perfectly~~ perfectly inelastic

$e = 1$; unitary.

* Production Possibility Curve:

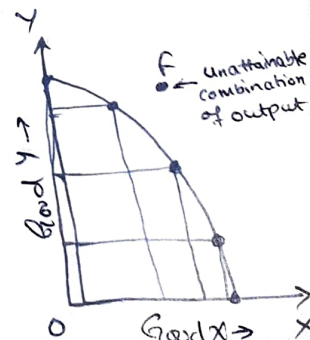
(aka Production Boundary / Production frontier)

(aka Transformation Line / Transformation Curve).

- Curve showing alternative production possibilities of two goods with given resources and technique of production.

- Curve showing different combination of two goods which can be produced with available resources on assumption:

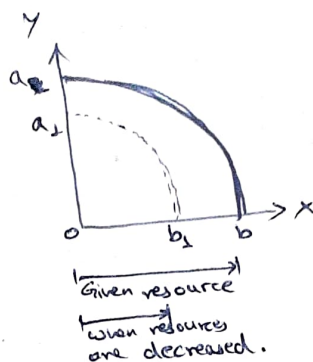
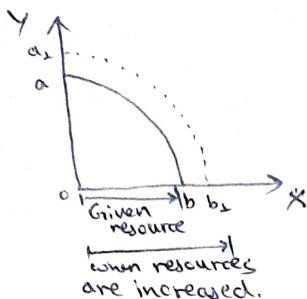
- i) resources are given
- ii) given resources are fully & efficiently utilised.
- iii) Technology remains constant.



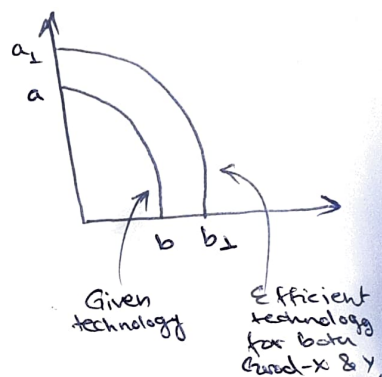
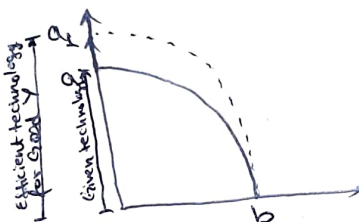
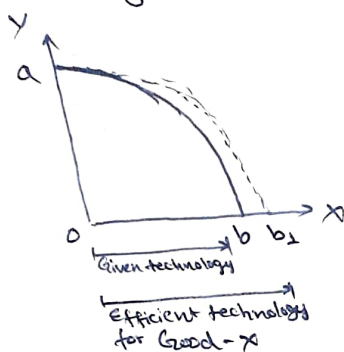
- All points lying on PPC or inside PPC are attainable combinations of output of two goods, with given resource.
- Any point lying outside the boundary line of PPC shows 'unattainable combination' of output of two goods.

• Shifting / Rotation of PPC:

1. Change in Resource.



2. Change in technology.



• Properties of PPC:

- i) PPC curve slopes downward.
- ii) PPC is concave to the point of origin.

• Opportunity Cost: It is the value of the next best alternative when a decision is made, it is what is given up in exchange for another product/good.

• Marginal opportunity cost:

Rate of loss of output of B for every additional unit of A produced when resources are shifted from B to A.

$$\text{Marginal opportunity Cost} = \frac{\Delta Y \text{ (loss in output)}}{\Delta X \text{ (gain in output)}}$$

defines slope of PPC.

i.e., Marginal opportunity cost is the slope of PPC.

* Consumer's Equilibrium:

CONSUMER THEORY : Law of Demand

• **Utility**: Satisfaction derived from the consumption of a commodity.

• **Measurement of Utility**:

- Utility Analysis → 1. **Cardinal Measurement**: Measuring satisfaction in cardinal numbers (like rating in scale of X).
- Indifference Curve Analysis → 2. **Ordinal Measurement**: Cannot be measured in units. Only can be ranked as 'high' or 'low'.

• **Consumer's Equilibrium** is a state wherein a consumer gets 'maximum satisfaction' out of his given income and he has no tendency to make any change in his existing expenditure.

* Utility Analysis of consumer's ~~Behaviour~~ Equilibrium assumes Cardinal Measurement

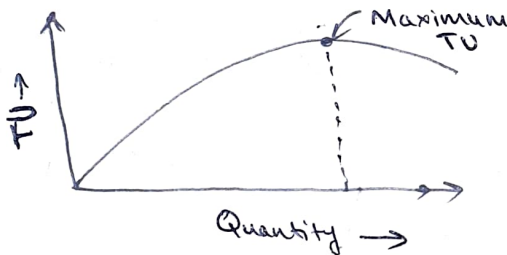
• **Total Utility (TU)** is sum total of utility = $U_1 + U_2 + \dots + U_n$

• **Marginal Utility (MU)**: $MU = TU(n) - TU(n-1)$

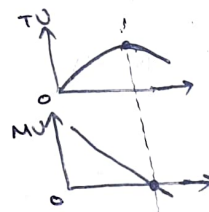
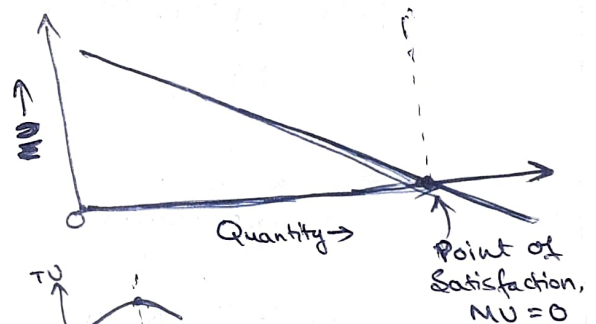
↳ @ an additional unit

$$MU = TU_n - TU_{n-1}$$

• **Relationship between TU and MU.**



- TU increases so long as MU is +ve
- TU is max when $MU = 0$
- TU starts declining when MU is -ve
- Decreasing MU implies that TU increases at a decreasing rate.



• **Law of Diminishing Marginal Utility (DMU)**

(aka, Fundamental Law of Satisfaction / Fundamental Psychological law)

- When consumer consumes more and more standard units of a commodity, after every addition unit consumed, the marginal utility derived must decline, given

Two assumptions → 1. Only Standard Unit of commodity consumed
2. Consumption of commodity is continuous

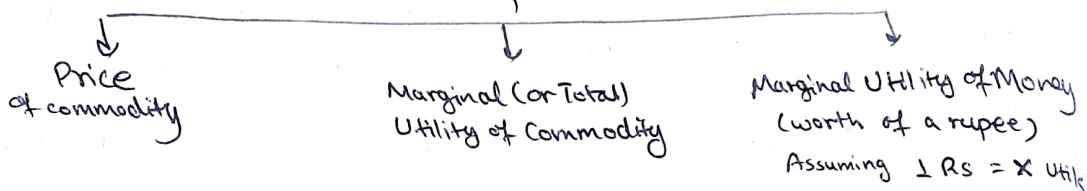
*Marginal Utility Analysis and Consumer Equilibrium

- How much commodity consumer buys to gain maximum satisfaction and attain point of equilibrium?
1. When only one good / commodity is consumed.
 2. When two or more commodities are consumed.

CASE I:

One Commodity Case

(purchase of commodity depends on 3 factors)



State of Equilibrium, when MU_x (in terms of Rs) = P_x

Alternative way

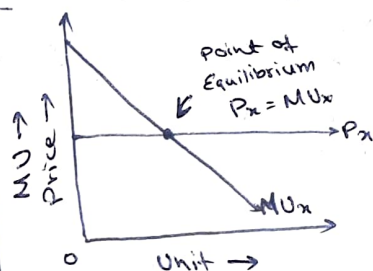
Equilibrium is when Rupee worth of Satisfaction that the consumer "expects" to Get (MU_m) is equal to Rupee worth of Satisfaction that he "actually" gets (MU_x / P_x)

MU_m =
Rupee worth of Satisfaction consumer expects to get.

$\frac{MU_x}{P_x}$ =
Rupee worth of Satisfaction that consumer actually gets

Marginal Utility of Money

Marginal Utility of Commodity / Price of Commodity



Consumer will keep consuming until he/she reaches the point of equilibrium, $P_x = MU_x$

CASE II:

Two Commodities Case

for good X, $\frac{MU_x}{P_x} = MU_m$ - (i)

for good Y, $\frac{MU_y}{P_y} = MU_m$ - (ii)

∴ Consumer Equilibrium, $MU_m = \frac{MU_y}{P_y} = \frac{MU_x}{P_x}$

\downarrow M.U. per rupee expected by consumer \downarrow M.U. per rupee spent on good-Y \downarrow M.U. per rupee spent on Good-X

CASE III: N-Commodities Case: $\frac{MU_1}{P_1} = \frac{MU_2}{P_2} = \frac{MU_3}{P_3} = \dots = \frac{MU_N}{P_N} = MU_m$

* Law of Equi-Marginal Utility:

Consumer strikes his equilibrium when the last rupee (spent by him) gives him equal marginal utility whether he spends it on Good-X or Good-Y.

In case of two-commodities, equi-marginal utility equation:

$$MU_x = MU_y$$

(as discussed in last part).

* Indifference Curve Analysis of Consumer's Equilibrium.

- Based on Ordinal measurement of utility.

• Assumptions:

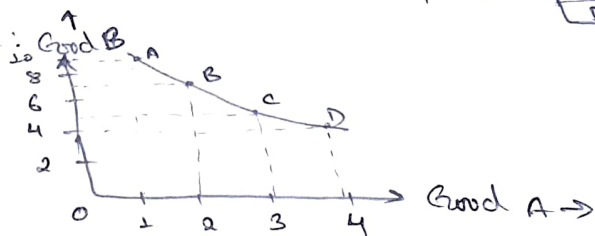
- Consumer's Money Income is given and it is fixed.
- Consumer spends his income on those goods which can be substituted for each other.
- Consumer's preference for two goods are well-defined.
- More of good always gives satisfaction to consumer (Monotonic Preference of goods).
- Consumer is rational and will try to maximise satisfaction.

• Indifference Set:

- Let Good A and Good B be substitute to each other.
- Different combination sets A, B, C, D.
- Each combo offers same level of satisfaction.

COMBO	GOOD A	GOOD B
A	1	10
B	2	7
C	3	5
D	4	4

• Indifference Curve:



• Properties of Indifference Curve (IC),

- 1) IC slopes Downward ↘
- 2) IC is convex to origin ↪

• MRS (Marginal Rate of Substitution) is Slope of IC = $\frac{\Delta Y}{\Delta X}$
Rate at which the consumer is willing to substitute one good for the other. $\frac{\Delta \text{good Y}}{\Delta \text{good X}}$

3) Higher IC shows Higher Level of Satisfaction

4) ICs do not cross/intersect each other

5) IC does not touch X-axis or Y-axis

