

Economics (HSA250)

18/1/22

Module-1: Introduction to Economics

Economics is the study of subject where resources are limited. How to use resources in an efficient way.

Microeconomics:

Branch of economics that deals with the behaviour of individual economic units - consumers, firms, workers, and investors - as well as the markets that these units comprise.

Macroeconomics:

Branch of economics that deals with aggregate economic variables, such as the level and growth rate of national output, interest rates, unemployment, and inflation.

→ These are the two main branches of economics.

Economics is divided into two main branches

Micro Macroeconomics

Themes of Microeconomics

a) Tr limits -

Much microeconomics is about limits - ex: the limited incomes that consumers can spend on goods and services.

Microeconomics is also about ways to make the most of these limits. More precisely, it is about the allocation of scarce resources.

→ For example, microeconomics explains how consumers can best allocate their limited resources' incomes to various goods and services.

→ It explains how workers can best allocate their time to labor instead of leisure or to one job instead of other.

→ And it explains how firms can best allocate limited financial resources to hiring additional workers versus buying new machinery and to producing one set of products versus other.

b) Trade-offs

In modern market economics, consumers, workers and firms have much more flexibility and choice when it comes to allocating scarce resources.

Microeconomics describes trade-offs that consumers, workers and firms etc face and show how these trade-offs are best made.

Trade off → opportunity cost is expressed in terms of next best alternatives.

All trade offs are based on prices and markets
(demand & supply).

c) Prices & Markets

↳ Role of prices. - Microeconomics also describes how prices are determined.

In a centrally planned economy, prices are set by government.
In a market economy, prices are determined by interactions of consumers, workers and self firms.

— Collection of buyers and sellers together determine the price of a good.

v) Theories and models.

- Begins with assumptions.

Theories are developed to explain observed phenomena in terms of a set of basic rules and assumptions.

with the application of statistical and econometric techniques,

A model is a mathematical representation

We can depict our model either through mathematical formula or graphical representation.

Market :

Check the MA-I.

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Basic economic problems, Model construction & market

Three significant questions, equilibrium.

What, how & for whom.

1) What to produce

2) How to produce

3) For whom to produce.

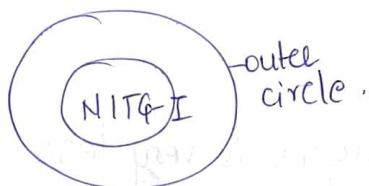
Incentives → Concession to stimulate greater output or investment.

SEZ special economic zone.

Let us take a Model,

Case of Apartment, rental purpose.

→ If we connect all apartments around nitgoa we can visible two circles



where you want to stay as a student of NITG.

→ inner circle

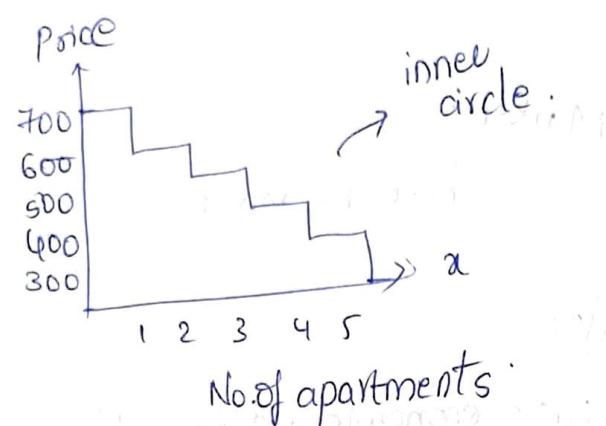
Who is deciding where to stay
→ DEMAND.

BUT! everyone can't stay at inner circle, as apartments are limited.

- Prices of apartment at inner circle are high wrt outer.
- Structure is same but demand is more.

How the price is going to determine

Demand & supply graph

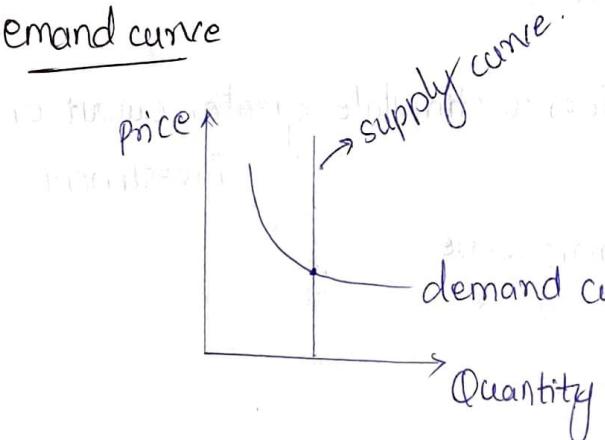


Price & Quantity demanded are inversely proportional.

independent
(Price) \propto Quantity demand

DEMAND LAW

Demand curve



Why there is diff in both demand curves?

In first case:

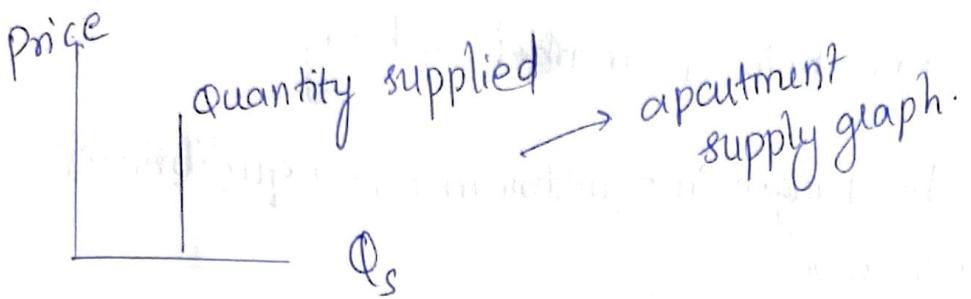
no. of buyers are very less and diff of price is also less.

In second case:

Price diff b/w two buyers is very less, so that curve is looking like that.

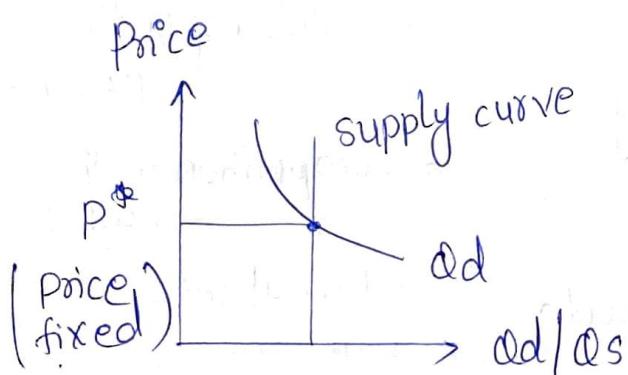
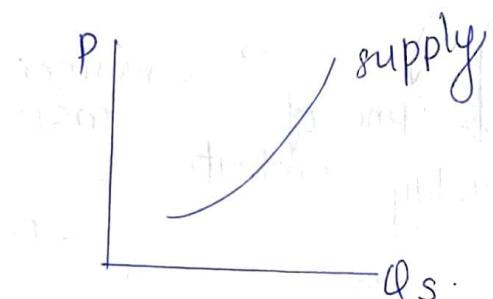
- Many buyers & sellers.

Supply curve

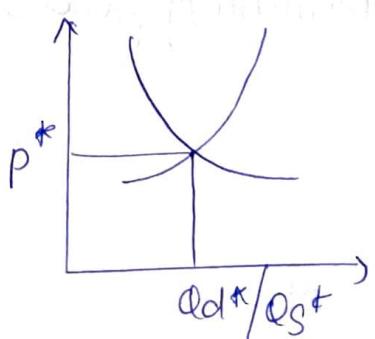


- We can't increase supply within short period
- it doesn't depend on price.

Normal supply curve



Equilibrium :-



Whenever there is change in price (means some $P > P^*$ or $P < P^*$)

equilibrium will arrive

See MA-2.

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- Equilibrium price helps for market stability.

There will be changes in equilibrium but equilibrium price always same.

- There will be an equilibrium.

Demand function & Supply function:

$$Q_d = f(P, Q_L, P_R, T, Y)$$

income of buyer/consumer.
Consumers taste & preference.
Desire to buy the product
Availability of the product
Competition in the market
Usefulness.

Q_d depends on
price of the product
Quality
Substitute

$P_R \rightarrow$ price of related commodity.

Substitute goods or
complementary goods.

Ex:- Petrol is complementary good of car/bike
left & right shoes are complementary goods
fuel & car
pencil & paper.

$Q_d = f(P)$ Other things constant:

can be function of price only
or

can be function of price & income

This may not change constantly
so, only price is taken.

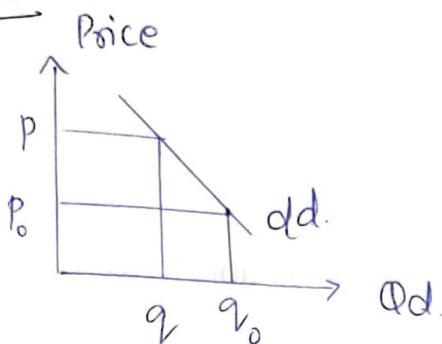
$Q_s = f(P)$

→ Q_s also can be defined as function of price.

DEMAND LAW - Q_d is inversely proportional to price

SUPPLY LAW - Q_s is directly proportional to price.

Graphs



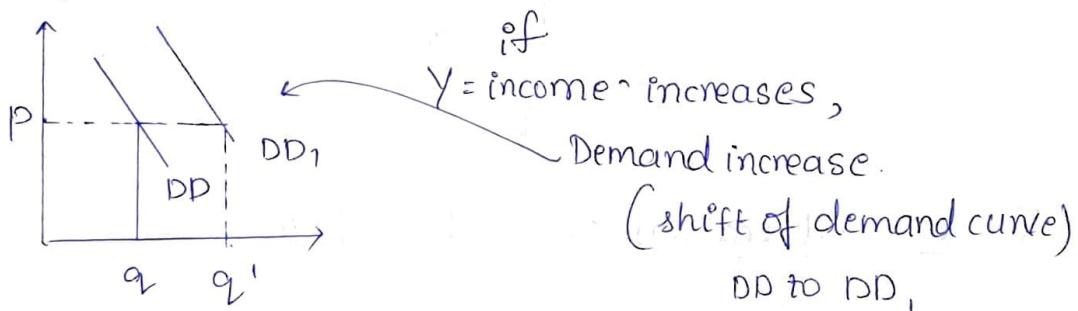
- If price is high, Q_d will be low
- Whenever there is changes in price, quantity will be moving through demand curve.

Change in price can be measured through existing demand curve.

How demand curve changes when there is a change in any of other things (other than price)?

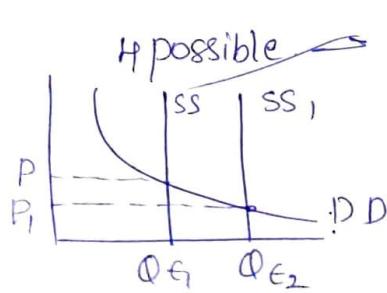
We assumed that all other factors are constant.

If they are not constant,



Apartment case :-

From today onwards, new builder launch apartment for rent purpose. Then what happens.



More supply, so ss shifts right. slight reduction in price occurs where there is more availability of same commodity.

Demand ↓.

Equilibrium price changed (decreased).

Actually, 4 possibilities are there in total.

Ss shift right

Ss shift left

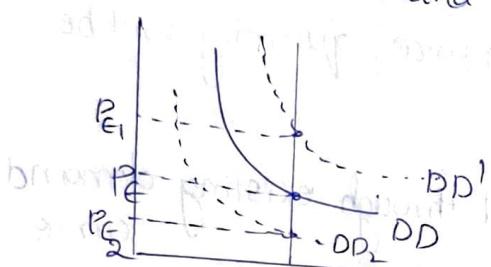
DD shift right

DD shift left

If 4th year students have to leave immediately,

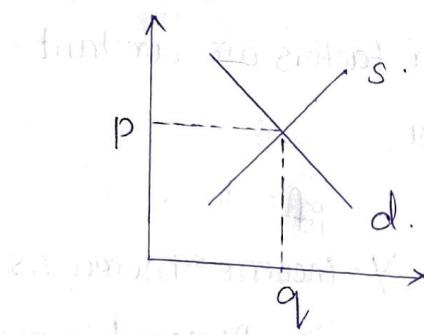
dd ↑

demand increases.



There will be an equilibrium; but it may be a new one.

Equilibrium :-



(Resource Allocation) can be through?

- 1) Price mechanism
- 2) merit based system

↳ who all are eligible

- 3) Lottery
- 4) First come first serve
- 5) Reservation system
- 6) Auction (we will set a base price)

7) Rationing

Suppose there ^{is} ~~will be~~ a flood, Govt will take class over the supply of essential goods
Biased distribution = Rationing.

These all are various forms/mechanism available to distribute goods.

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Module-2. Utility, Budget Constraint & preferences

What is economics?

- Study of limited resources
- Study of production & transfer of goods
- Distribution of commodities.

Economics is a science, which deals with all human behaviour aspects related to wants and ~~sours~~ alternatives.

~~all resources are sours.~~

(Limited in available)

Economics tells -

- 1) How to reach equilibrium position
- 2) How to satisfy human beings with limited resources that have multiple uses.
- 3) Teaches you the relation b/w wants and sours.

Micro & Macro economics

↓

Study of individual human behaviour (firm)

Consumer's preference :-

Q. How to express the preference?

A

B

2 Bundles / baskets where multiple goods are available.

- Same price & same size.

Ans: based on requirement

based on utility

how much we can afford

} Answers by
students.

Whether these two bundles will give same satisfaction

There are three cases :-

$A > B \Rightarrow$ Strictly preferred (at any point / location) the consumer will choose A over B)

$A \geq B \Rightarrow$ Weakly preferred (\rightarrow today may be i preferred A over B, tomorrow it may change)

$A \sim B \Rightarrow$ A is indifferent over B [Indifferent preference].
(equally)

(neither A nor B consumer doesn't have any preference)

This is not economics.

Economics is fully aware of commodities.

Three axioms :-

① Completeness : every time consumer can compare any bundle and tell the preference.

At any time consumer can compare btw commodities and take the preference.

② Reflectivity :

$A \sim B$

equally preferred to A

Compare

A with A

A with A

every place

Preference is A .

indifferent in A over A that's y

we choose A every time.

③ Transitivity:

A over B
B over C
then A over C

$A > B, B > C \text{ then}$
 $A > C$.

Utility:

- Every product have their own utility \rightarrow Satisfaction
- Utility \rightarrow Power of commodity.

Subjective in nature

\hookrightarrow vary from person to person.

- It can be measured. - "Cardinal Utility Measurement"

- Some other says, it can't be measured.

Finally, \Rightarrow Utility can be "Ordinal". \rightarrow in case of utility, cost doesn't matter.

\hookrightarrow can be ordered but not measured

or
Utility can be convertly measured.

Total utility:

(3 apples)

$$U_1 + U_2 + U_3 = TU.$$

Total utility refers to the total satisfaction received by the consumer from consuming different units of a commodity.

While marginal utility, denotes the additional utility derived from the consumption of extra unit of a commodity.

Marginal utility:

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

when you are consuming an additional unit of same commodity, how much utility is derived is known as Marginal Utility.

Quantity / Units	Total Utility (TU)
3	10
4	15

$$MU = 15 - 10 = 5.$$

units	TU
3	10
5	16

$$\frac{6}{2} = 3$$

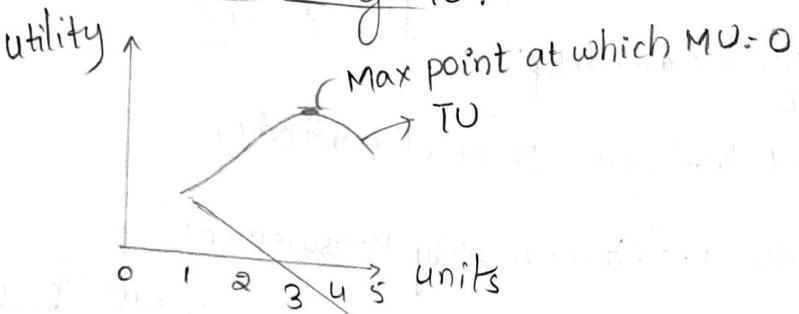
- may be 3

- but not exactly 3

* Marginal utility can be +ve, -ve, 0.

$$MU = \Delta TU = \Delta U.$$

Law of diminishing MU :-



→ When total utility increases, MU & TU changes.
MU is always decreases.

→ At max point, MU=0.

→ TU → decreases
MU → becomes -ve

U	TU	MU
1.	10	-
2.	18	8
3	24	4
5	30	2
6	30	0
7	28	-2

TU > MU.

MU is derived from TU.

MU ⊂ TU.

↓
is subset of

slides regarding this topic

- Consumer preference
- Fundamental assumptions on CP.
- Utility
- Law of diminishing marginal utility

Preferences:

- Every consumer has a set of likes and dislikes, desires and tastes called preferences over all goods and services.

A

B

Bundle A

Bundle B.

- Can compare two combinations or bundles of goods and services in terms of better, worse, or the same.

- Strictly preferred ($>$) $x > y$

- Indifferent (\sim) $x \sim y$

- Weakly preferred (Σ) $x \geq y$ (at least as much as)

Three axioms

- fundamental assumptions to ensure internal consistency.

- Completeness:- the consumer can compare any bundles and render a preferred or indifferent judgement.

- Reflexivity:- this identity condition says that the consumer is indifferent when comparing a bundle to itself.

- Transitivity:- if bundle A is preferred to bundle B and bundle B is preferred to bundle C then bundle A must be preferred to bundle C.

Utility:

A curve that showing combinations of two goods that gives the consumer equal satisfaction and utility.

- Utility is the want satisfying power of commodity
- Utility is subjective
- Utility is relative - varies with time, place and person
- Cardinal and ordinal utility

Concepts of utility

- Initial Utility: the utility derived from very first unit of commodity.
 - Total Utility: The aggregate of utilities obtained from the consumption of different units of commodity.
- $$TU_n = U_1 + U_2 + \dots + U_n$$
- Marginal Utility: change in utility resulting from change in consumption
 - $MU = \Delta U = TU_n - TU_{n-1}$
 - Positive, zero and negative MU.

Law of diminishing marginal utility

The law states that the additional benefit which a person derives from a given increase in stock of a thing diminishes with every increase in the stock that he already has, *ceteris paribus*.

This assumption increases the marginal utility derived from each additional unit declines.

- Utility can be measured
- MU of money remains constant
- Every unit of commodity remains the same wrt size and quality.
- Continuous consumption
- Suitable quantity of the commodity is consumed
- There is no change in income, tastes, character, fashion

and habits of the consumer.

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Indifference curve

- Representation of consumer's preference \rightarrow IC is the best
- An indifference curve (IC) shows the diff combinations of x_1 and x_2 that yield equal satisfaction to the consumer.

Combinations			satisfaction
A	1	20	10
B	2	15	10

Assumptions:

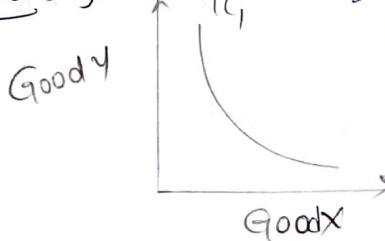
- An ordinal approach
- Rationality of consumer - consumer sees all the available choices and choose the best.
- Non-satiety : consumer is not oversupplied with goods in question
- Transitivity of choice
- Consistency of choice
- Diminishing marginal rate of substitution

IC schedule

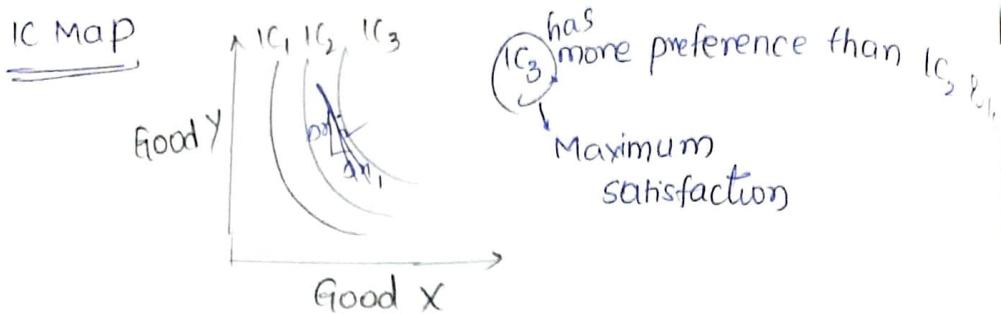
Combinations

A	1	20	--
B	2	15	5
C	3	11	4
D	4	8	3
E	5	6	2
F	6	5	1

Graphical representation



IC has a peculiarity that it has same level of satisfaction

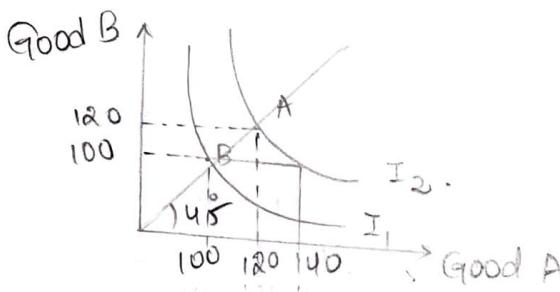


Marginal rate of substitution \Rightarrow slope of indifference curve = $\frac{\Delta Y}{\Delta X}$

- The rate at which an individual must give up good 1 in order to obtain one more unit of good 2, while keeping their overall satisfaction level constant
- MRS keeps declining since consumer has more and more units of one good, he gives up less units of other goods.

Properties of IC

- Negative & slope
- Always convex to the origin
- Two IC never intersect each other
- Higher IC shows higher level of satisfaction
- More goods are preferred to less goods
- Higher IC contains more of either one or both goods.



- Downward sloping.
 - Implies that when the amount of one good in combination is increased, the amount of other good is reduced
 - This is essential if the level of satisfaction is to remain the same on an IC.

- Convex to the origin.

- Two commodities are imperfect substitutes for each other
- MRS btwn two goods decreases when consumer moves along an IC.

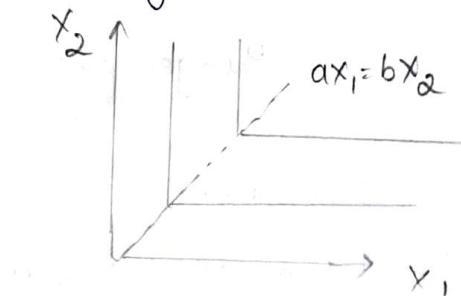
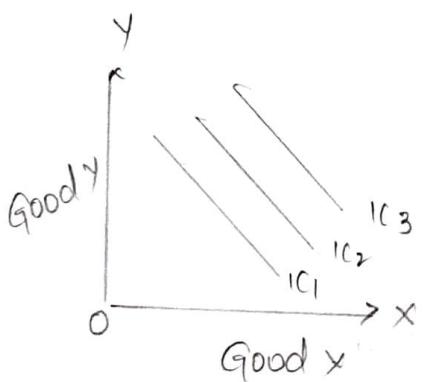
Two extreme conditions:

- When two goods are perfect substitute, IC will be a straight line

↓
rate of exchange is
same. MRS is same / constant.

- When two goods are complementary, IC will be L shaped.

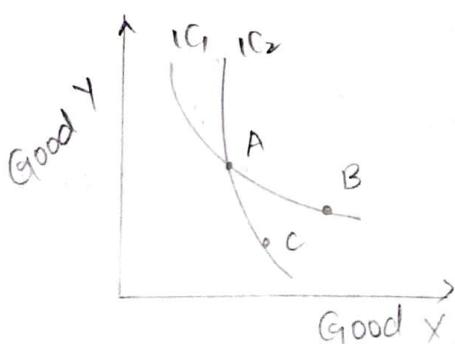
↓
we need both the commodities for our
satisfaction



- Two ICs never intersect each other.

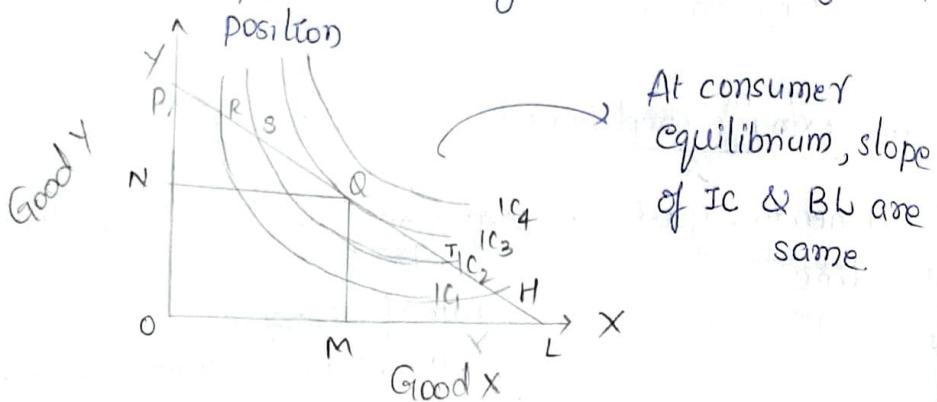
Q IC's → two diff levels of satisfaction

when they intersect → at that point two diff
satisfactions will be there
which is not possible.



Consumer equilibrium

- Consumer is in equilibrium when he is deriving max satisfaction from the goods and:
- He is in no option to re-arrange the purchase of goods.



At consumer equilibrium, slope of IC & BL are same.

At equilibrium slope of IC and BL are same

$$MRS_{x,y} = \frac{\Delta y}{\Delta x} = \frac{P_x}{P_y}$$

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Budget preference

Module 2 describes -

- Describes what a consumer can afford
- how the consumer determines what is best

Budget Constraint

- Consumption Bundle (x_1, x_2)
- Prices of the two goods (P_1, P_2)
- Amount of money (m)
- Budget constraint $\rightarrow P_1x_1 + P_2x_2 \leq m$ inequality
- Budget set \rightarrow equality

Budget constraint

Equilibrium is a situation where two forces are meeting each other, we can't change that position.

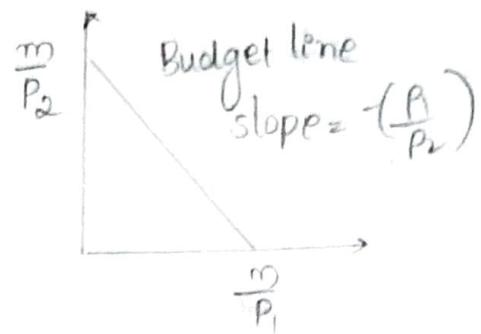
- ① Willingness \rightarrow human wants are unlimited
- ② Budget \rightarrow limitation to our wants.

Properties of budget set

Budget line $\rightarrow P_1x_1 + P_2x_2 = m$

$$x_2 = \frac{m}{P_2} - \frac{P_1}{P_2}x_1$$

Vertical intercept slope



Slope and opportunity cost

The slope of the BL measures the rate at which good 1 is substituted for good 2

- $P_1x_1 + P_2x_2 = m$
- $P_1(x_1 + \Delta x_1) + P_2(x_2 + \Delta x_2) = m$
- $P_1\Delta x_1 + P_2\Delta x_2 = 0$
- Total value of changes in consumption is zero
- $\frac{\Delta x_2}{\Delta x_1} = -\left(\frac{P_1}{P_2}\right)$

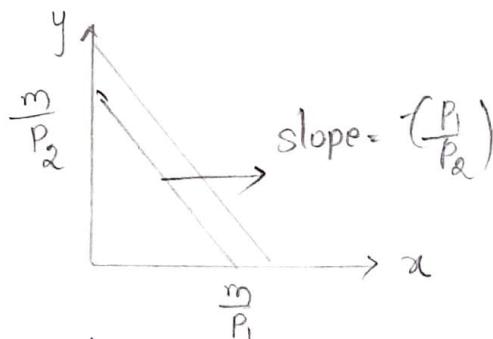
- Shifting of budget line
- Impact of taxes, subsidies and rationing
- Indifference curve. \rightarrow consumer equilibrium

changes in Budget Line (changes in prices and income)

- changes in Income

$$x_2 = \frac{m}{P_2} - \frac{P_1}{P_2}x_1$$

Price changes \rightarrow slope changes.

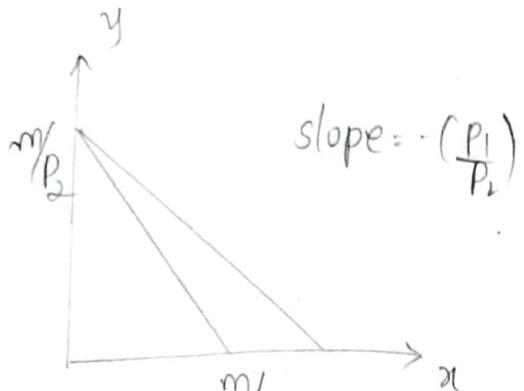


As income increases, BL shift right side

Budget line
slope = $-(\frac{P_1}{P_2})$

As $P_1 \downarrow$ then $\frac{m}{P_1} \uparrow$

Price changes → slope changes

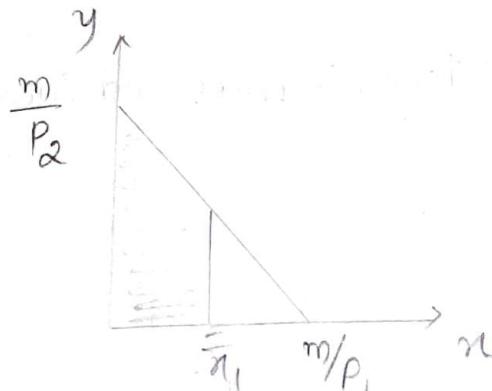


Taxes, Subsidies and Rationing

- Quantity tax: consumer has to pay a certain amount to the government for each unit of the good he purchases.
 - Tax is just like a higher price $\rightarrow (P_t + P)$
 - BL must get steeper
- Value Tax: tax is on the value and is expressed as a percentage.
 - The actual price facing the consumer is $(1+p)P$
- Lump sum tax
- Subsidy is the opposite of taxes.

Rationing

- Level of consumption of some good is fixed to be no larger than some amount



Module 3 :-

Demand, Revealed Preference & Slutsky equation

We have discussed on:

- Budget line
- Consumers preference
- Optimal choice.

The demand function :

- Demand refers to consumer's desire to purchase goods and services and his willingness to pay for the same.
- demand function gives the optimal amounts of each of the goods as a function of the prices and income faced by the consumer.
- $x_1 = x_1(p_1, p_2, m)$
- $x_2 = x_2(p_1, p_2, m)$
- how the demand for a good changes as prices and income change.

Normal and Inferior good

- Let's start by considering how a consumer's demand for a good changes as his income changes.
- Prices will be fixed.
- Normally as income increases, demand for each good also increases.
- Accordingly BL will shift outward
- Normal good: $\frac{\partial x_1}{\partial m} > 0$
- Are there abnormal goods?
- An increase of income results in a reduction in the consumption of one of the goods
- Inferior good: $\frac{\partial x_1}{\partial m} < 0$.

Normal goods \rightarrow As income \uparrow demand also \uparrow .

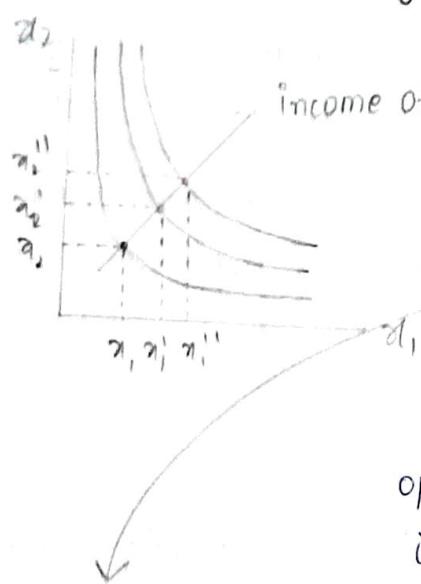
\rightarrow Among price, income, if anyone changes demand changes.

Inferior commodity \rightarrow when income \uparrow demand \downarrow
 \rightarrow inversely proportional

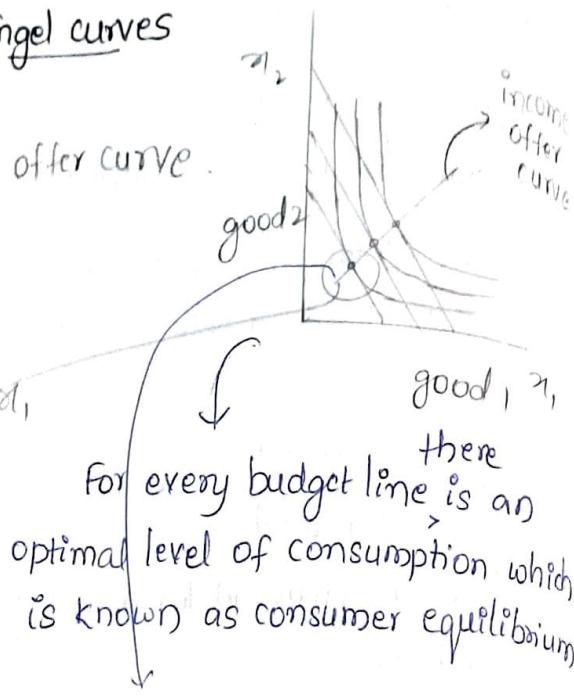
Ex:- Auto.

when income \uparrow , they want to travel in taxi. demand \downarrow

Income Offer curve and Engel curves



income offer curve.



For every budget line there
is an optimal level of consumption which
is known as consumer equilibrium

- lower level of budget and
lower level of satisfaction.

3 optimal points

corresponds to three diff levels
of consumption.

- As it shifts right,

we are consuming both π_1, π_2
more and more level of satisfaction.

Consumption of both goods increases.

π_1, π_2 \rightarrow two commodities.

\rightarrow +ve slope is because both the commodities are normal
(income \uparrow demand \uparrow)

\hookrightarrow consumption of goods \uparrow .

Assignment \rightarrow What will be the curve, if when one of the good is inferior.

Note: For inferior commodities, it is not necessary that the graphs are straight lines.

- Income Offer curve is also known as income expansion path
- Will be having a positive slope if both goods are normal good.

Engel Curve :

$$\textcircled{1} \quad x_i^o = x_i(p_1^o, p_2^o, m) : \text{ Guess what?}$$

- Normal demand curve.

\downarrow
income & price

As price \uparrow demand \downarrow

income \uparrow demand $\uparrow \rightarrow$ income curve.

\textcircled{2} Then,

$$x_i^o = x_i(p_1, p_2, m_i) : \text{what is this?}$$

- Engel curve.

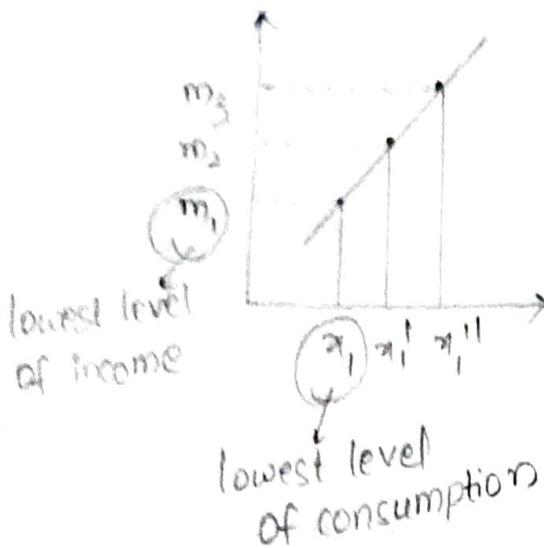
- Price is constant,

- demand of commodity and income.

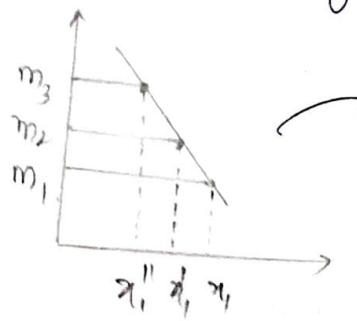
Both income curve & engel curve are changes in income, & price is constant. Then what is the difference?

Engel curve \rightarrow particular commodity

Income curve \rightarrow optimal combination of two commodities.

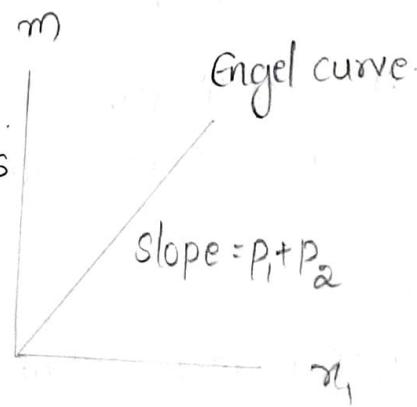
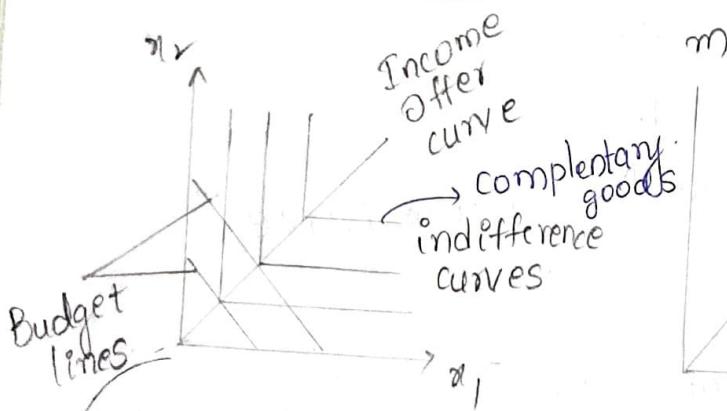


→ if α is inferior commodity?



it is already mentioned that for inferior commodity, it is not necessary that graph is straight line.

Example: Perfect complement



A. Income offer curve

B. Engel curve.

→ Same degree & same angle.

- Since the consumer will always consume the same amount of each good, no matter what, the income offer curve is the diagonal line through the origin

- Since the demand for good 1 is $\rightarrow x_1 = \frac{m}{p_1 + p_2}$

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Ordinary good and Giffen good

- Let's now consider price changes.
- Suppose that we decrease the price of good 1 and hold the price of good 2 and money income fixed. Then what can happen to the quantity demanded of good 1.
 - This is ordinary good.
 - Decrease/increase in the price of certain good leads to reduction/increase in the quantity demanded of that good.
 - Such goods are called Giffen good.

Income fixed

↳ decrease/increase in price of certain good leads to reduction/increase in demand.
↓
Giffen good

- Price \propto demand \rightarrow Ordinary good. \rightarrow Law of demand

Why giffen?

↳ let us take an illustration

- Consider a family with maximum expenditure on food 400 rupees
- Minimum consumption required 50 kg (rice and wheat).

Good	Price	Qty	Expenditure	
Rice	5	40	200	↳ 400 Rs.
Wheat	20	10	200.	

If price of Rice increases to 6 Rs. \rightarrow

Good	Price	Qty	Expenditure
Rice	6	40	240
wheat	20	10	200.
			440 Rs.

Now they reduce wheat consumption and increase rice

6	43	258
20	7	140.
		398 Rs.

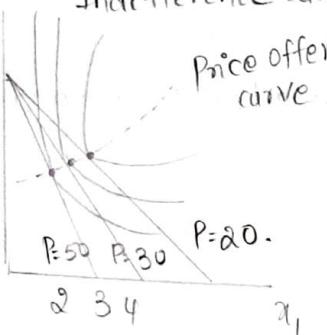
Although price of rice ↑, consumption ↑ to balance.

Note:

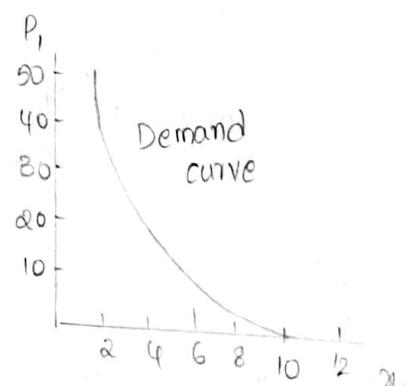
- All giffen goods are inferior goods
- All inferior goods are not giffen.

The relationship btw price offer curve & demand curve

a) Indifference curves



A. Price offer curve.



B. Demand curve.

Examples:

- Few examples of demand curve
- Perfect substitute
- The demand for good 1 is

$$= 0 \quad \text{when } P_1 > P_2$$

$$= \text{any point} \quad \text{when } P_1 = P_2 \\ \text{on the BL}$$

$$= m/P_1 \quad \text{when } P_1 < P_2$$

What can be the case of perfect complements?

Slutsky Equation → Assignment

Income and substitution effect

- when price of a good changes there are two sorts of effects in your consumption: the INCOME effect and SUBSTITUTION effect.
- A consumer might respond in following two ways when price of pepsi falls :

1. Great news! Now that pepsi is cheaper, my income has greater purchasing power. I am, in effect, richer than I was. Because I am richer, I can buy both new more pizza and more pepsi.

- This is the income effect.

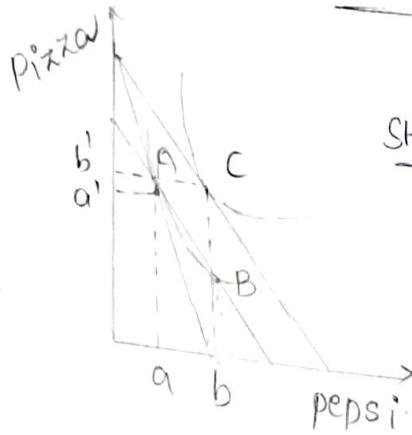
2. Now that the price of pepsi has fallen, I get more liters of pepsi for every pizza that I give up. Because pizza is now relatively more expensive, I should buy less pizza and more pepsi.

- This is the substitution effect.

Change in demand due to change in the rate of exchange (relatively price changes) btw two goods is called -
Substitution effect.

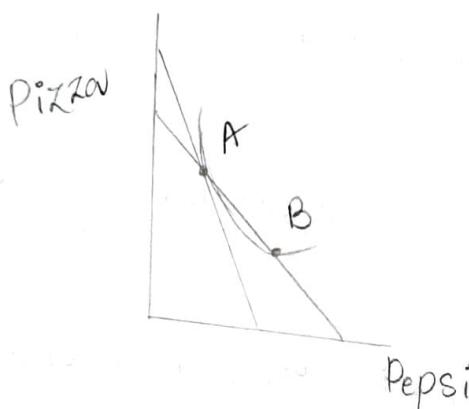
- Change in demand due to the change in purchasing power - Income effect

Decomposition of Pf and SE



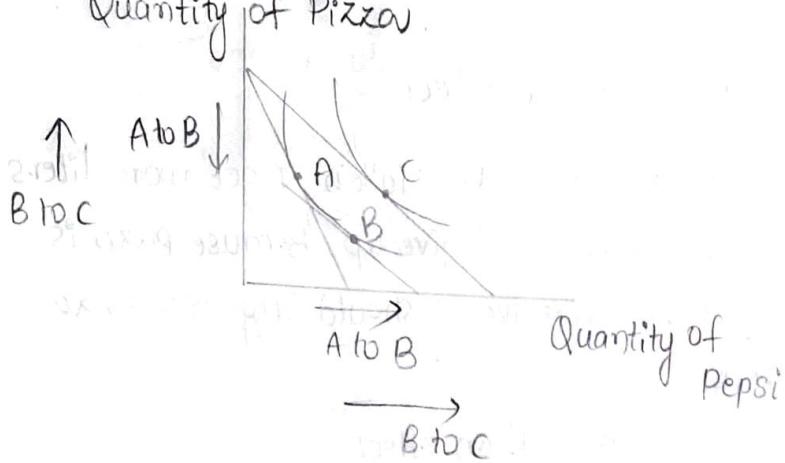
Step 1: relative price changes, adjust m_{mon}
income to hold pp constant

Step 2: pp adjust while holding relative
prices constant



Income and Substitution Effects

Quantity of Pizza.



Initial optimum at A.

Price of Pepsi falls.

Substitution effect:

From A to B, buy more Pepsi and fewer pizzas.

Income effect:

From B to C, buy more of both goods.

Good	Income effect	Substitution effect	Total effect
Pepsi	+ (Richer - More Pepsi)	+ (Relatively cheaper)	+
Pizza	+ (Richer)	- (Relatively More expensive)	-

- Check Assignment for clear understanding.

22/2/22

Assignment

Module 4 : Consumer Surplus, Market Demand & Equilibrium

Market equilibrium → Prices are adjusting to make supply and demand meet.

Welfare → Satisfaction they are attaining

Nations wealth is measured by GDP → National income standard.

but many are critizized becoz some may have more wealth, some may not have any.

→ It won't measure actual wealth like happiness.

(rich but not happy).

Revisiting the market equilibrium :

- Do the equilibrium price and quantity maximize the total welfare of buyers and sellers?
- Market equilibrium reflects the way markets allocate scarce resources.

Welfare Economics :

- Study of how the allocation of resources and goods affects social welfare.

- Equilibrium in the market results in maximum benefits and therefore maximum total welfare for both the consumers and the producers of the product.
- Consumer surplus measures economic welfare from the buyer's side
- Producer surplus measures economic welfare from the seller's side.

Consumer surplus:

- Willingness to pay is the max amount that a buyer will pay for a good.
- It measures how much the buyer values the good or service
- Consumer surplus is the buyer's willingness to pay for a good minus the amount the buyer actually pays for it.

Four possible Buyer's Willingness to Pay -

Buyer	Willingness to Pay	Price	Buyers	Quantity Demanded
John	\$100			
Paul	80	More than \$100	None	0
George	70			
Ringo	50	\$80 to \$100	John	1
		\$70 to \$80	John, Paul	2
		\$50 to \$70	John, Paul, George	3
		\$50 or less	John, Paul, George, Ringo	4

Demand schedule and Demand curve -

