

- 1) Micro Economics
- 2) Macro Economics
- 3) Indian Economics

Indian Economics

National Income Accounting

→ GDP - Gross Domestic Product to grow by 7.1% in next financial year.

→ Gross National Product (GNP)

→ Market value / Monetary Value of all Final goods or services produced within the political boundary of a country within a specific time period is called GDP

1) Market value / Monetary Value

Diversified products : Rice, cars, softwares, computers.

Diversified products are quantified in terms of currency.
Thus easier to express

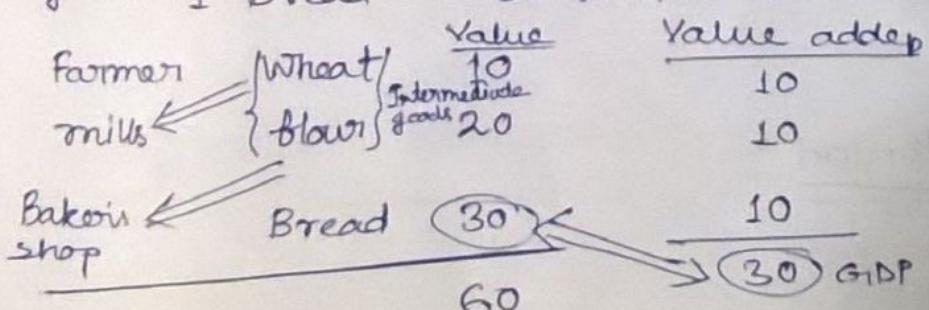
2) Final (avoids double count):

e.g. Nalanda complex = 100 Cr.

(Cement, Steel, Electrical equipment etc.) = 50 cr.

Intermediate goods

e.g. 1 Bread = 30 \Rightarrow GNDP



Final product depends on ultimate consumer i.e.
how consumers use them

3) Political Boundary:

- It is produced in political boundary of the country irrespective of the producer's citizenship.
This is domestic GDP
- Citizen of a country producing final goods in any other country accounts for GNP not GDP

GNP: Market value / Monetary value of all final goods and services produced by the citizens of a country within a specific time period.

Part of GNP may be included in GDP. Profit of NRI's are included in GDP of Indians.

e.g.

Factors of production ✓

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

⇒ Why to measure GNP?

To see economic progress / economic progress of all citizens

4) Specific Time Period:

Watch

2010 → 500

Result 2017 ⇒ (50) → not added in GDP

Reasons → No addition of value

Double count

Use-value
Exchange-value

Water-Diamond Paradox

depends on Marginal Utility
on
upon Scarcity

Books

Macro Economics - E. Shapiro
Mankiw

Micro Economics - A. Koutsoyiannis
D. Salvatore

Indian Economy - Dutt & Sundaram
Journal Articles

- Micro economics deals with individual consumer/product.
On the other hand macro eco. deals with aggregate.
- Business fluctuation, Cost fluctuation, these two are central issues of each and every economy

Inflation

Inflation → When cost of goods rise continuously

Deflation

Deflation → When cost of goods decline continuously

Aggregate demand = aggregate supply

Equilibrium

$AD \neq AS$

Fluctuation

$AD > AS \Rightarrow \text{Progression}$

$AD < AS \Rightarrow \text{Recession}$

If an economy experiences negative growth in GDP for consecutive two economies, it is called have recession

Producers, Consumers and the government are interrelated players in an economy.

(Factor market)

Consumers
or
households

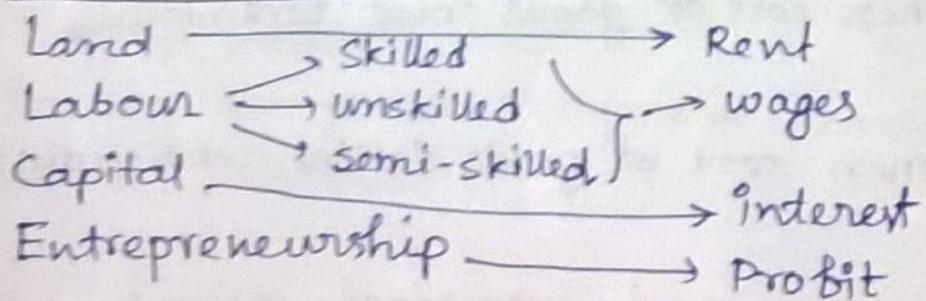
Govt.

Producers

Consumer perishable goods → Fish → Price changes with time
Consumer durable goods → Television → Price change over long period of time.
i.e every producer

Everyone is an entrepreneur producing a good or providing a service.

Factors of production

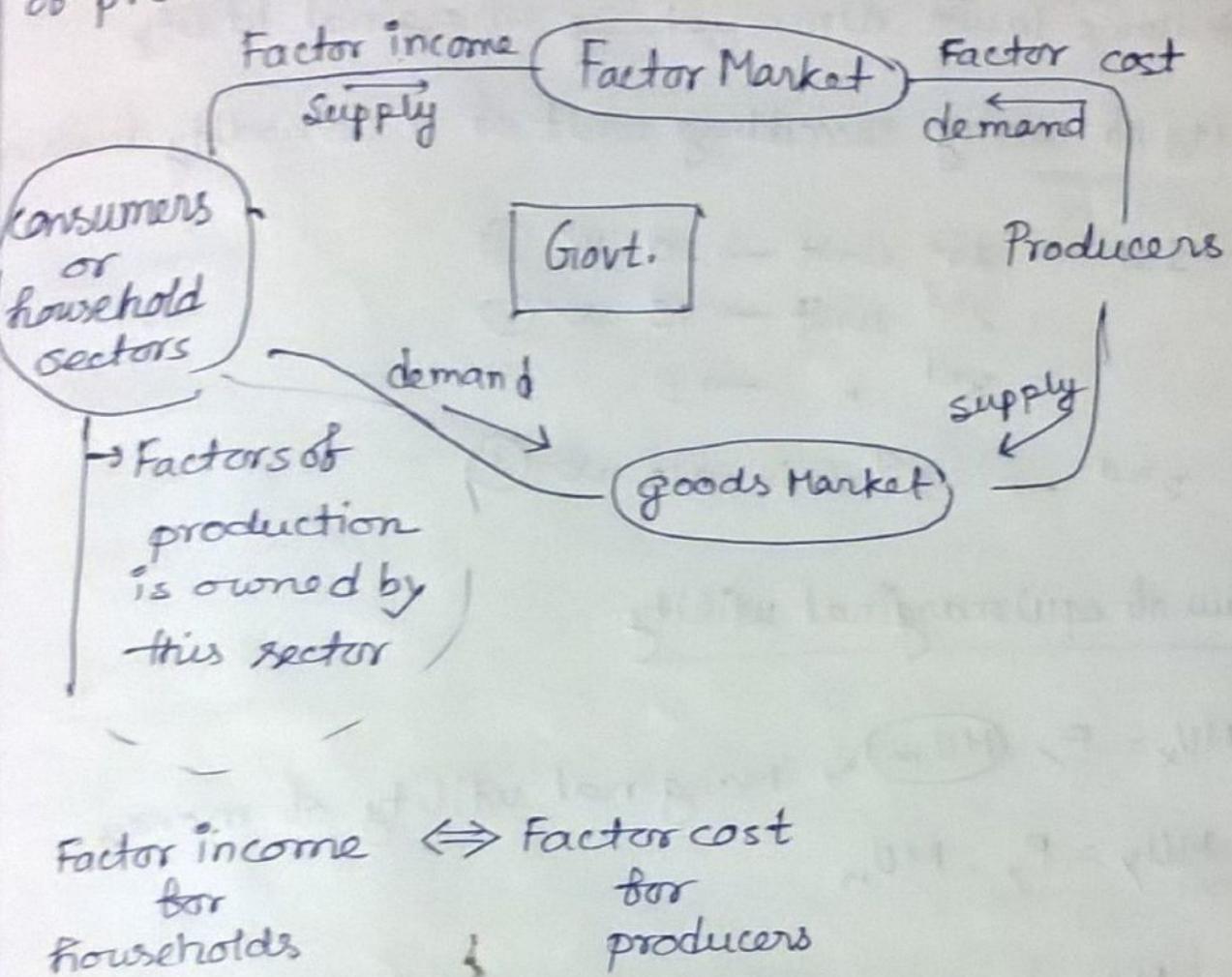


→ Capital: Equipments

Land → free gift of nature
capital → produced by man to quicken the production process, used in long run of time.

→ Entrepreneur: Takes risk to do the business ^{engaging} land, labour and capital firing

→ The household is the owner of all these four factors of production.



Total income of an economy

$$\Sigma \text{factors income} = (\text{wages} + \text{Rent} + \text{Interest} + \text{Profit})$$

10/01/2023

Kiran

- * Marginal utility of money remain const.
- * utility is additive
- * consumer is yet to saturate with satisfaction
- * that commodity follows law of diminishing marginal utility

Utility of every succeeding unit of a commodity decreases

- * 1st \rightarrow 1st unit $\rightarrow 20 \checkmark$ ①
- 2nd unit $\rightarrow 15 \checkmark$ ②
- 3rd $\rightarrow 5$

$$2^{\text{nd}} \rightarrow 2^{\text{nd}} \text{ unit} \rightarrow 12 \checkmark ③$$

* Law of equimarginal utility

$$\frac{MU_x}{P_x} = MU_m \rightarrow \text{Marginal utility of money}$$

$$MU_y = P_y \cdot MU_m$$

$$\frac{MU_x}{P_x} = MU_m = \frac{MU_y}{P_y}$$

$$\boxed{\frac{MU_x}{MU_y} = \frac{P_x}{P_y}}$$

\Rightarrow Law of equimarginal utility

Criticism

- \rightarrow Marginal utility of money should not be const.
It should also vary as any other commodity.
- \rightarrow Utility of a commodity is relative
- \rightarrow Level of satisfaction leads to irrational behavior of consumer

$$\frac{\Delta Y_1}{\Delta X_1}$$

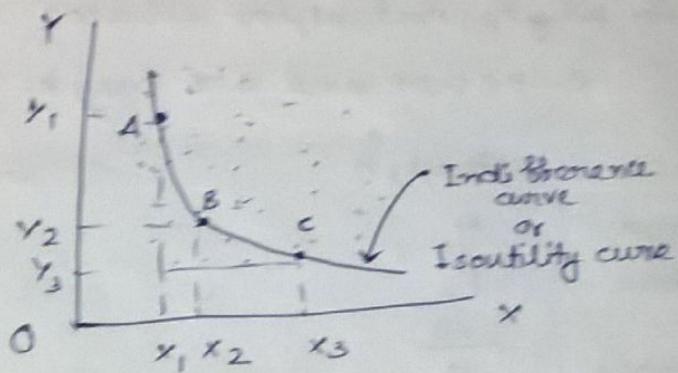
Isotiliv
 \rightarrow Negat
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- 1) Market
- 2) Final
- 3) Politic
- 4) Spec

\nwarrow Self
Black
 \searrow Prod
Self
me

Ordinal Measure of utility

→ Follows diminishing rate of substitution



$$\frac{\Delta y_1}{\Delta x_1} > \frac{\Delta y_2}{\Delta x_2} > \frac{\Delta y_3}{\Delta x_3}$$

IsoUtility curve

→ Negative slope

→ convex to ~~mirror~~ origin

12/01/2017
BKS

1) Market value / Monetary value

2) Final

3) Political territory

4) Specific time period

⇒ Self services / consumptions are not part of GDP.

Black market

→ Producers are included in GDP also in terms of self consumption unlike self service of a family member. Also rent of house is included in GDP.

In practical

$$GNP > GDP$$

and GDP is more important to a country

For any hypothetical solo situation

GNP < GDP and GNP may be crucial

	Country A		Country B
Land	A		B
Labour	L_A	>	$\frac{L_B}{10}$
	<u>10</u>		<u>1</u>
Domestic	9		9
outsource	1		

$$GNP_A = GNP_B = 10$$

$$GDP_A = 18$$

For country A GDP is more important
and Country B find GNP to be more
important.

If most of the citizens of a country work abroad,
then GNP is more important to the country compared
to GDP.

GDP Factor cost (GDP^F)

$$GDP_{\text{Market price}} = GDP^F + (\text{Industrial Taxes} - \text{subsidies})$$

$$= GDP^F + \text{net indirect taxes}$$

G_tNP^F

$$G_tNP^N = G_tNP^F + T - S$$

Net domestic product: NDP^F

$$= G_tDP^F - \text{Depreciation}$$

Depreciation = "Used up of fixed capital"

Net National Product : NNP

$$= G_tNP - \text{Depreciation}$$

MNP^F \Rightarrow ~~National Income~~

$$\begin{aligned} NNP^F &= G_tDP^F + \underbrace{\text{Net Income from abroad}}_{G_tNP^F} - \text{Depreciation} \\ &= \text{National Income} \end{aligned}$$

Three methods to calculate G_tDP, G_tNP, NNP

① Expenditure Method \rightarrow Measures G_tDP^F

② Income method

③ Value added method

Consumer Expenditure (C)

Producer Expenditure / Investment Expenditure (I)

Government spendings (G)

Export (X)

Import (M)

$$C + I + G + \underbrace{(X - M)}_{\text{Net foreign spending}} = G_tDP^F$$

Net foreign spending

$I = \text{private expenditure} + \text{public expenditure}$

$G =$

$X = \text{Foreigner spending on domestic goods and services}$

$M = \text{Domestic spending on foreign goods.}$

2) Income Method

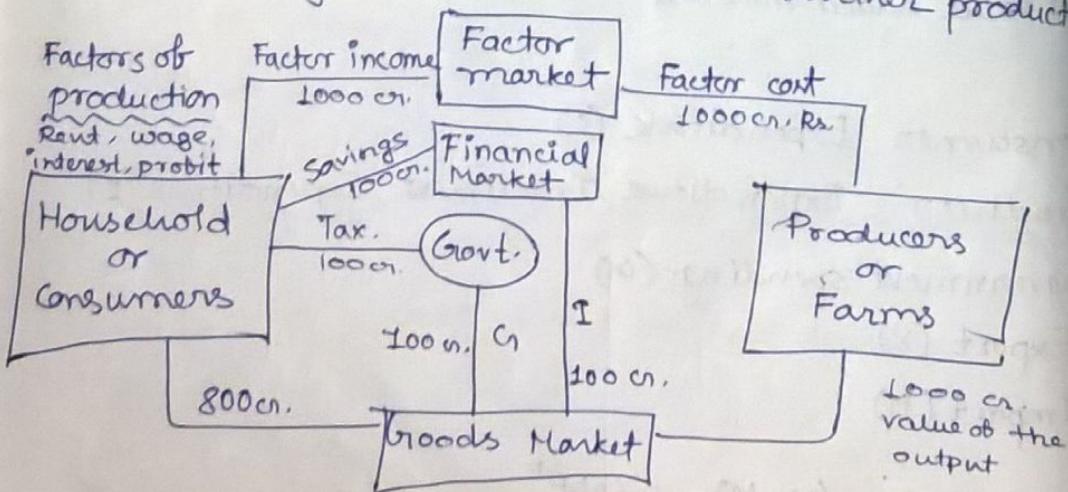
$$NNP^F = \text{Wage} + \text{Rent} + \text{Interest} + \text{Profit}$$

3) Value-added Method : Measures $\# NDP^M$

	<u>Value</u>	<u>Value added</u>
Farmer : wheat	10	10
Mills : Flour	20	10
Baker's Shop: Bread	30	10
NDP^M		(30)

16/01/17
NC Nayak

Capital good / Investment good / Producer good: Products that are again used in course of further production



Factors of production:

1) Land 2) Labour, 3) Capital, 4) Entrepreneurship

Price of product = $R + W + I + P$ = Value of the output

Personal disposable income = Factor income - tax

Tools & equipments are basically considered as capital goods

Govt demands both capital goods and consumer goods.

In India govt. acts as both producer and consumers.

Govt. Revenue = Tax revenue + Non-tax revenue
(probit generated by
PSU undertaking)

Lower the rate of interest, higher is the investment

Income is flow, Wealth is stock

G_I = Govt. investment in goods market

I = Banks providing loan, is also of the form of investment of goods market

* India is in a state of demographic dividend

* Income is at equilibrium. Demand, supply should be in an equilibrium

$$AD = AS$$

Aggregate demand Aggregate supply

$AD > AS \rightarrow$ Boon, Inflation

$AD < AS$

Demand propels growth

$$S_t = D_{t-1}$$

Supply in 2018 - Demand in 2017

No country experiences inflation

* Rising price is always welcome, brings growth.
It is acceptable to a certain limit. Falling price reduces
the growth.

Zimbabwe has inflation rate of almost 1000%

Same applies for Russia when Soviet Union ^{was} broke

- During inflation fixed income people are worst affected. Salaried class are not fixed income people.
- Inflation rate within a certain limit promotes growth. 3% inflation rate is growth promoting and wellness promoting.
- Growth vs. development

17/01/17

K. Grewani

Ordinal Measure of utility

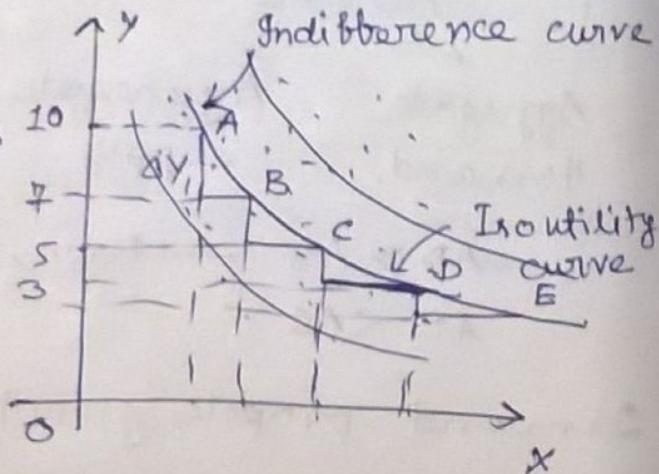
Income is limited

Consumer should be rational

Utility is transitive* & relative

Follows diminishing rate of substitution

Locus of points at which two different commodity that generates same utility is called iso utility curve.



$$\Delta Y_1 \cdot MU_Y = \Delta X_1 \cdot MU_{X_1}$$

$$\frac{\Delta Y_1}{\Delta X_1} = \frac{MU_X}{MU_Y}$$

Rate of substitution of y for x = $\frac{\Delta Y_1}{\Delta X_1}$

= Slope of indifference curve.

There may be family of indifference curves. These curves never intersect. They are always parallel.

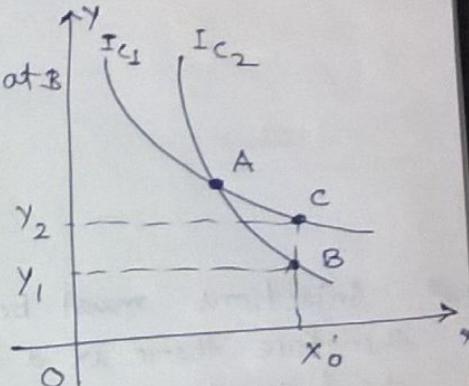
Let such two curves intersects

utility at A = utility at C = utility at B

at C $y = OY_2$, $x = X_0$

at B $y = OY_1$, $x = X_0$

\Rightarrow utility at C \neq utility at B



\Rightarrow They can not intersect

Higher the indifference curve, higher is the level of satisfaction.

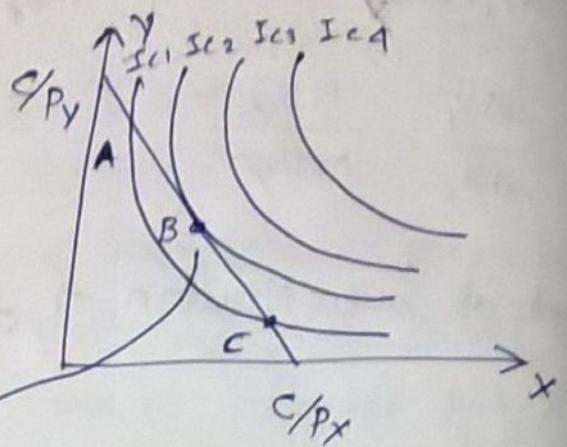
consistency & transitive

$$C = P_x \cdot X + P_y \cdot Y$$

$$X = \frac{C}{P_x} - \frac{P_y}{P_x} Y$$

$$Y = \frac{C}{P_y} - \frac{P_x}{P_y} X$$

point of tangency of budget line to indifference curve gives consumer equilibrium



17/01/17

N C Nayak

injections must be equal to leakages
therefore there is a balance between income/demand and supply.

Equilibrium Income

Keyansian Theory

Prior to keyansian there was classical theory.

(1776 - 1936)

classical Gdology

→ Market is supreme

→ Govt. should not interfere market

Keyansian Theory : Capitalist

→ Resources are owned by private sector

Equilibrium Income
↓

$$AS = AD$$

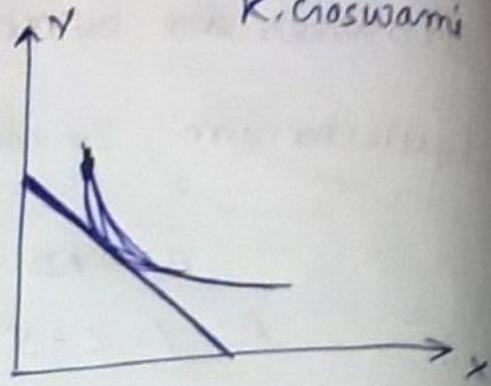
$$AS = Y = C + S \longrightarrow \text{Identity}$$

$$\begin{array}{ccc} \text{Savings} & \xleftarrow{\quad} & S = I \\ \text{leakage} & & \xrightarrow{\quad} \text{Injection} \\ Y = C + I & \xrightarrow{\quad} & \text{eqbm.} \end{array}$$

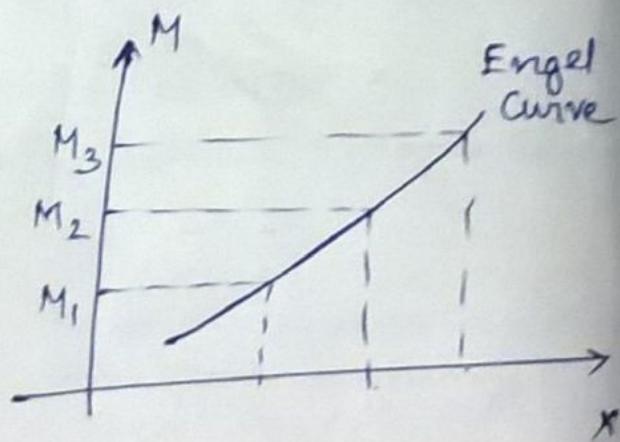
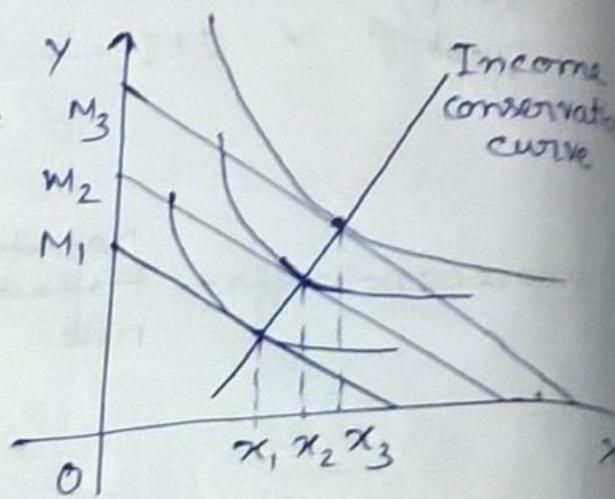
Microeconomics -

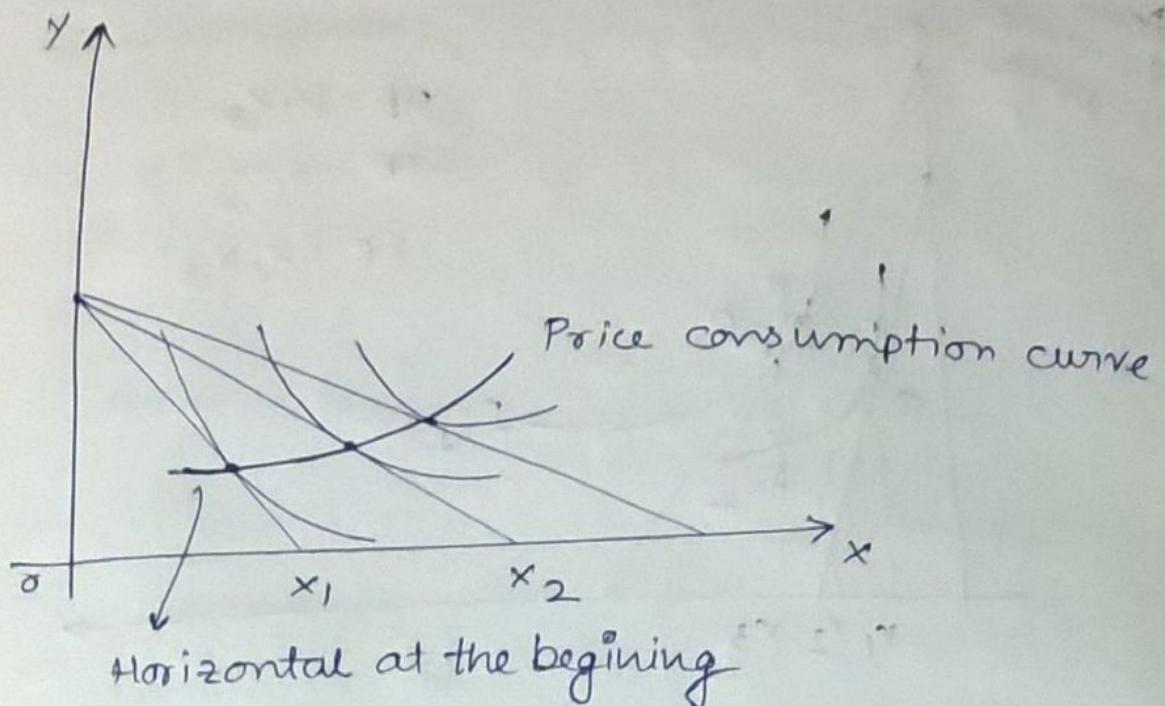
Madan Lal
~~Mutharika &~~
Miller

19/01/17



ICC lines might not be a straight line always





Income effect of price change helps facilitate thinking that income has increased or decreased

Substitution effect.

+ Hicksian Approach

As price of x decreases, consumption of x increases

$$\underbrace{PE}_{\text{price effect}} = x_1 x_3$$

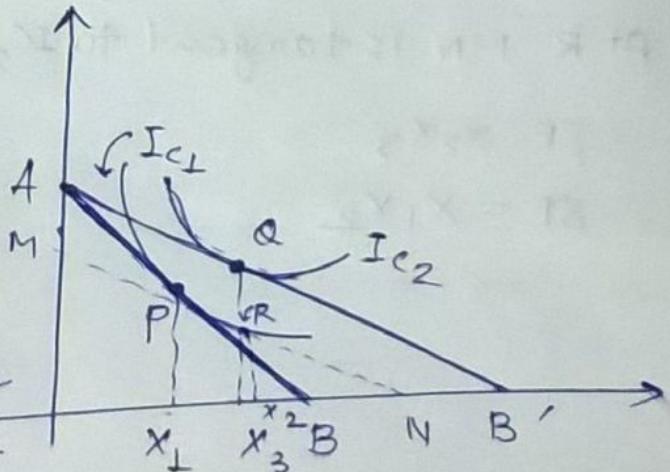
Income decreases in such a way that it return back to initial ^{indifference} position.

MN || AB'

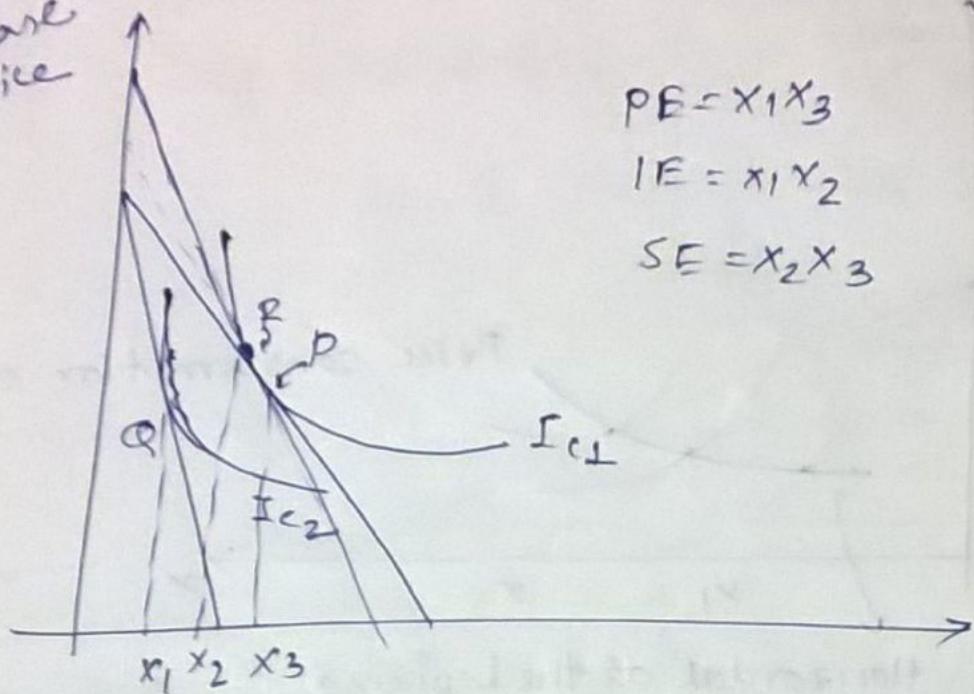
$Q \rightarrow R$ movement is due to income effect

$$\underbrace{IE}_{\text{Substitution effect}} = x_2 x_3$$

$$PE - IE = \underbrace{SE}_{\text{Substitution effect}} = x_1 x_3 - x_2 x_3 = x_1 x_2$$



~~Decrease~~
Increase
in price



* Slutsky Approach

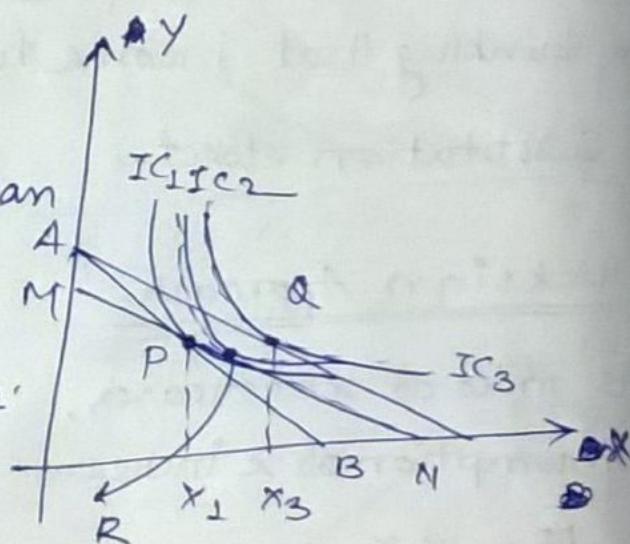
$$PE = x_1 x_3$$

If income decrease, one can purchase the original combination of x & y .

At R MN is tangent to IC_2 .

$$IE = x_2 x_3$$

$$SE = x_1 x_2$$



Equilibrium Income

$$AS = AD$$

$$Y = C + S \longrightarrow \text{Identity}$$

$$\begin{aligned} S &= I \\ Y &= C + I \end{aligned} \quad \left. \begin{array}{l} \\ \end{array} \right\} \text{equilibrium}$$

$$Y = C + S + T$$

$$S + T = I + G$$

In open economy

$$S + T + M = I + G + X$$

↓ ↓
Import Export

$$Y = C + I + G + (X - M)$$

$$\boxed{Y = C + I}$$

Consumption Function

$$C = a + bY$$

↑ Autonomous income consumption
↑ Induced consumption

Consumption of current period depends only on current income.

$$S = -a + (1-b)Y$$

There is some consumption irrespective of income

Y	0	40	80	120	160
C	20	50	80	110	140
S	-20	-10	8	10	20

$$MPC = \frac{3}{4}$$

↓
Dis-savings → Borrowing
→ withdrawal of the past savings

$$b = \frac{dc}{dy} = \text{marginal propensity to consumption}$$

(MPC)

In short run MPC is const. In long run MPC may change.

1. $0 < MPC < 1$

$MPC = 1 \Rightarrow$ Entire changed income is saved.

2. $MPC = \text{const.}$

3. $APC \rightarrow$ Average propensity to consume

$$APC = \frac{C}{Y}$$

level of

At 0 income, APC is ∞ & then it declines and always remains above MPC.

As income increase, APC decreases.

unless all that is saved is invested, the economy will ^{not} be at eqm.

APC in India is much higher than that of USA.
APS in USA is much higher.

Real GDP and Nominal GDP

21/01/17

B. K. Sahoo

		GDP 2016		GDP 2016 (Real GDP)	
		A	B	A	B
016	100	200		100	200
\sum_6	$\Sigma 1$	$\Sigma 1$			
17	100	150			
Σ_{17}	$\Sigma 2$	$\Sigma 1$	200	150	

$$\frac{\text{Nominal GDP}}{\text{Price index}} = \text{Real GDP}$$

$$\frac{\text{GDP Nominal}}{\text{GDP Real}} = \text{GDP deflator} = \frac{\text{Inflation}}{\text{P.I. (Price index)}}$$

Inflation: Increase in general price level over a time period. It measures price index (P.I.)

$$\frac{\text{Price } \Sigma}{\text{General price}} = \frac{\text{Aggregate price (P)}}{\text{General price}} = \frac{\sum w_i p_i}{\sum w_i} = \frac{\sum w_i p_i}{w_i} = \frac{\sum w_i p_i}{\sum w_i}$$

w_i = weight for commodity i
 p_i = price for commodity i
 $\sum w_i = 1$

$$\frac{\text{Price } \Sigma}{\text{weight}}$$

x_1	2	0.1
x_2	3	0.5
x_3	1	0.4

$$P = 0.2 + 1.5 + 0.4 = 2.1$$

$$\text{Inflation} = \frac{P_t}{P_b} \times 100$$

P_b = general price level in base year

P_t = general price level in time t

$$\text{Price index} = \frac{\sum w_i p_t}{\sum w_i p_b}$$

P_{it} = Price of commodity i in time period t

$P_{id} = u^v \cdot r^{ip}$ in base year

~~#~~
Base year

\Rightarrow Not far from the current year

⇒ not be abnormal year or normal year
normal in terms
of both economic
& natural normality

i.e there should be economic normality
and no natural disasters like flood, draught or
tsunami.

$$PI = \frac{\sum w_i p_t}{\sum w_i p_{t^*}} \quad w_i = \text{commodity } i$$

$w_i^* = \frac{\text{current}}{\text{Base year quantity}}$

$$= \frac{\sum q_{ibt} p_{it}}{\sum q_{ipt} p_{ib}} = \text{Laapse price index}$$

$$PI(P) = w_i = q_{ib}$$

$$PI(L) = w_i = q_{it}$$

w_i = base year quantity

$$= q_{ib} - \frac{\sum q_{ib} P_{it}}{\sum q_{ib} P_{ib}} = P_{...}'s \text{ price index}$$

	Base <u>q</u>	Base <u>P</u>	Current <u>q</u>	Current <u>P</u>
X (Tea)	100	₹5	50	₹10
Y (Cotton)	100	₹5	150	₹8

Fisher index

$$PI(F) = \sqrt{PI(L) * PI(P)}$$

↓
Ideal price index.

$$GDP^R = \frac{GDP^N}{PI}$$

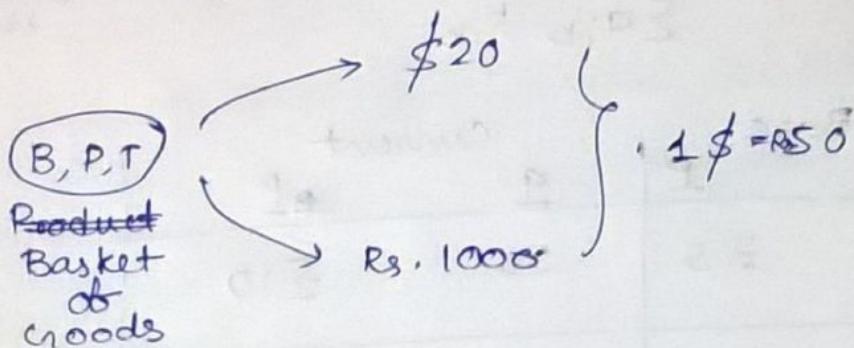
Per capita GDP

$$\frac{GDP}{\text{Population}} = \text{per-capita national income.}$$

Per capita income = $\frac{GDP}{\text{Population}}$

GDP purchasing Power Parity

GDP of different ~~even~~ countries should be in same currency to be compared. This is determined by purchasing power parity.



National Income Accounting

- GDP → GDP^M , GDP^F → Indirect taxes, direct taxes
- GNP vs. NNP vs. NDP vs. National Income
- Real GDP & Nominal GDP
- Price Index
- per capita GDP

Different concepts of inflation

- 1) Consumer price index (CPI)
- 2) Whole sale price index (WPI)

30/01/17

K. Choswami
and

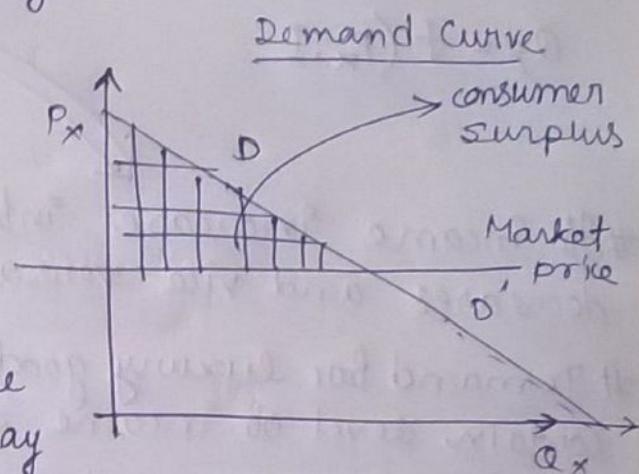
Demand

→ Desire for something backed by willingness and purchasing power.

→ Potential Buyer, Actual Buyer

$$Q_x = a - bP_x$$

↓
Price
demand



→ Law of demand holds true for aggregate level. But may not hold true at individual level

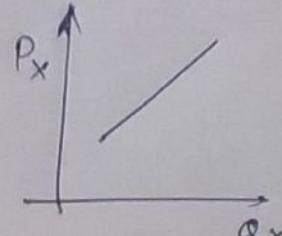
→ Exception for demand law

- Expectation for future price rise
- Purchasing a gift

Giffen Goods: Any essential commodity consumed by poor household, which takes almost their entire income.

e.g. <u>Foodgrains</u>	
10 kg	@ 15/-
5 kg	@ 8/-
15 kg	16/- } 300/-

→ Demand increase for poor quality good (costing less) with increase in price for a small time period

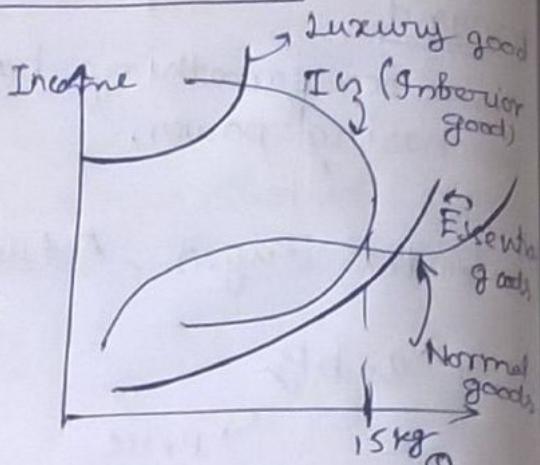


Demand curve may be non-linear also

$$Q_x = \alpha P_x^{-b}$$

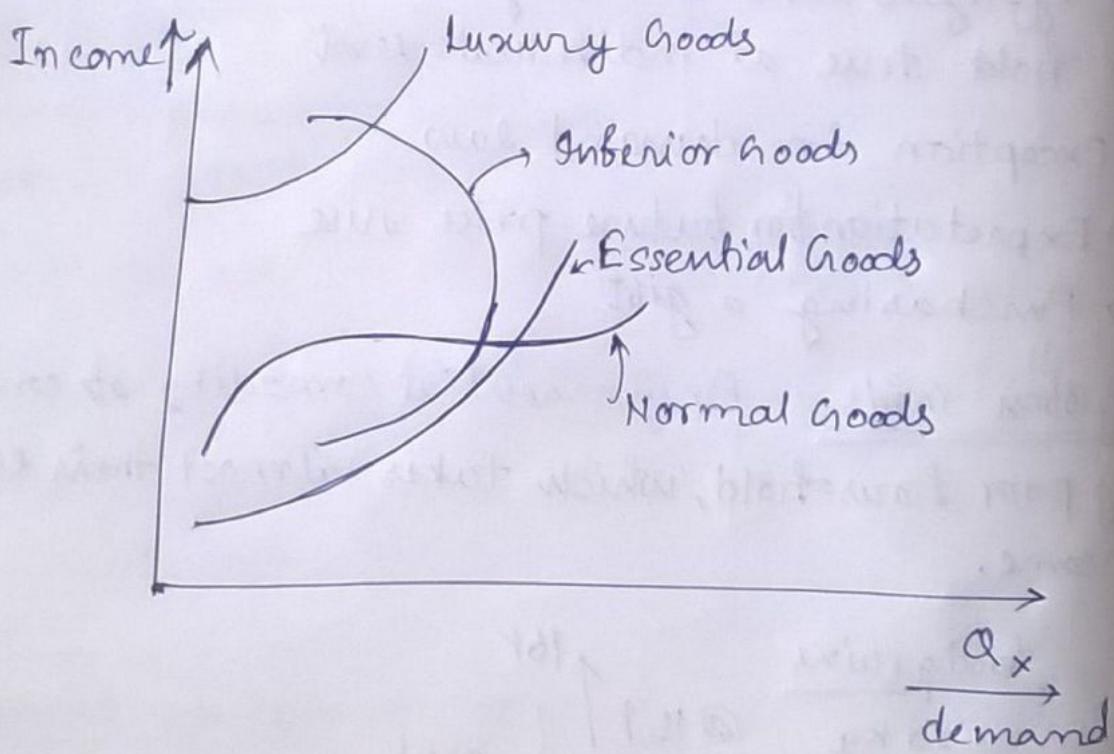
$$Q_x = \frac{a}{P_x + c} \cdot b$$

$$Q_x = f(P_x, I)$$



If income increases, inferior good demand decreases and vice versa is also true.

Demand for luxury goods initiates only after a certain level of income is reached



Demand also depends on close substitute price

Investment Function

$$Y = C + I$$

↓

Consumption Demand Investment Demand

Average propensity of averages in U.S.A is much higher compared to India.

Investment

- 1. Business Fixed Investment
- 2. Residential Investment
- 3. Inventory Investment

Consumer good may be natural or man-made
 Investment good are typically man made, these are basically tools and equipments.

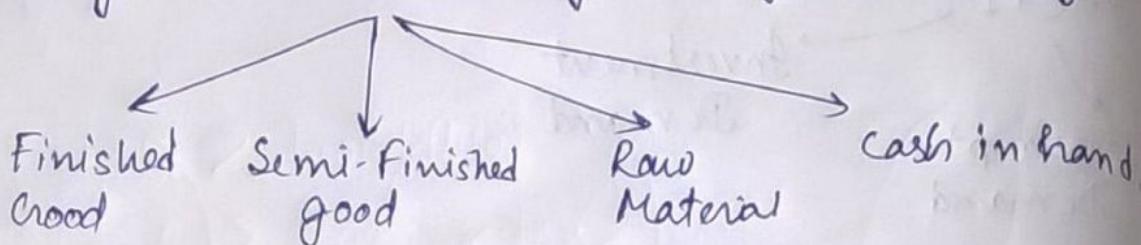
A good can be both consumer good or capital good;
 eg A car demanded by household → Consumer good
 A car n n companies → Capital good.

Investment in consumer goods ⇒ short time growth
 Investment in capital goods ⇒ long run growth

Most important type of investment is 1. Business fixed investment. These are fixed factor in use depending on ~~time~~ type of business. The mode of production can be either capital intensive or labour intensive.

Any developing economy is to realise a high investment in real estates

Inventory is a stock piling activity of company.



This type of investment comes into play when there is either of the two preceding types of investment

Inventory is set up to meet unforeseen contingencies

- nature of product
- nature of customer
- nature of competition

(Investment) \neq (Capital)

- Accumulation of wealth
- a stock
- a flow

Investment \neq Capital

$$I_t^g = 100 \text{ a.}$$

Change in Capital stock

= ~~gross~~ gross investment

gross capital in time t

$$I_t^g = K_t^g - K_{t+1}^g$$

gross investment
in time t

gross capital in time t + 1

When additional investment is made, there is a depreciation in capital.

$$I_t^n = I_t^g - D$$

↓ ↓
net investment depreciation
in time t

Net investment can be +ve, -ve or zero depending on depreciation

~~Growth~~ growth is promoted by the additional opportunities created by an investment

For long term economic growth, a +ve net investment is required.

Here we need to create new capital instead of making replacement investment

Investment depends on relative strength of these two

→ Marginal efficiency of capital (MEC)

→ Rate of Interest (r_o)

$$I = f(MEC, r_o)$$



Annual ~~return~~ rate of return on the Capital invested.

MEC is that discount rate which equalizes the present value of the prospective yields with the initial amount of capital invested.

Mathematically,

$$\sum_{t=1}^n \frac{R_t}{(1+i)^t} - \sum_{t=1}^n \frac{c_t}{(1+i)^t} = 0$$

$i > r \Rightarrow$ Profitable

$i < r \Rightarrow$ Loss concern

Present value of prospective yield

$R_t \rightarrow$ annual rate of return

$c_t \rightarrow$ initial investment

31/01/17

B. K. Sahoo

Price Index

→ consumer price index (C.P.I.)

→ wholesale price index (W.P.I.)

WPI	CPI
→ Does not include services	Includ services
→ Imported and intermediate goods are included	Not included

C.P.I.

→ C.P.I. for Rural Area

→ C.P.I. for urban area

→ C.P.I. for industrial workers

→ C.P.I. for agriculture labour

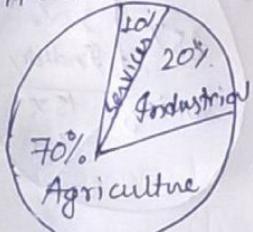
Basket of goods and price differ for different locations

Structural Transformation

Composition of GDP & employment changes over the period/process of development.

(1st stage of development)
Under-Developed

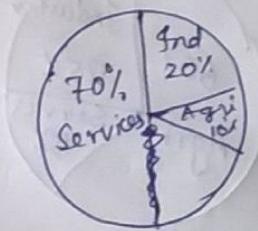
Both GDP & employment



(2nd stage of development)
Developing



Developed

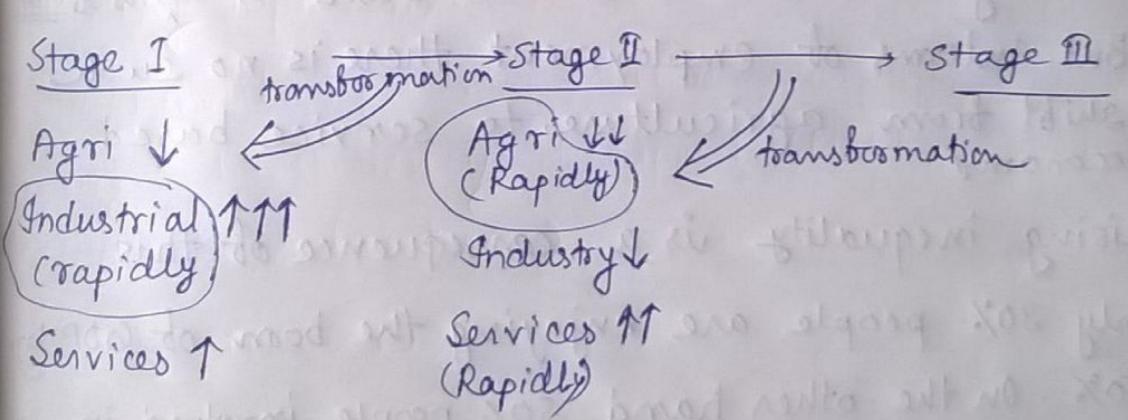


Agri ↓
Industrial ↑ (Rapidly)
Services ↑
GDP / Employment

Agriculture / Primary

Industrial / Secondary

Services / Tertiary

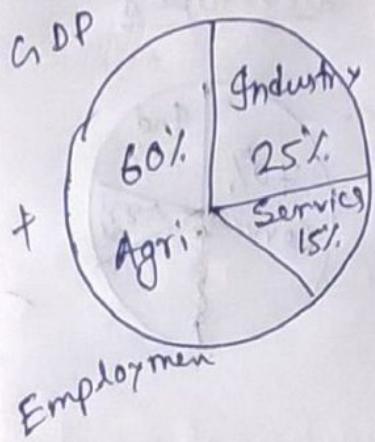


Transformation includes both GDP & employment.
Change in both should be in same direction.

Structural transformation, changes an agricultural based under developed, to industry based developing to services based developed economy.

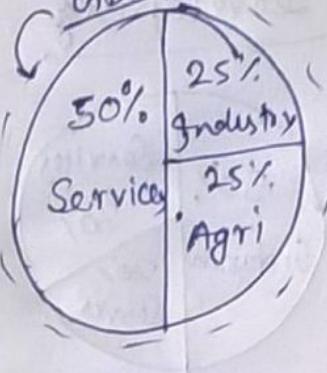
India has not followed this typical process of structural transformation

Stage I
(1960's)



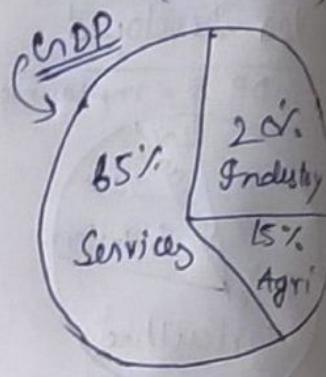
Employment

Stage II
(Late 1990's - 2000)



employment

Stage III
(2015-2016)



employment



Economy is shifted to service based in terms of GDP

But in terms of employment there is no such shift from agriculture to service based economy

Rising inequality is a consequence of this

Only 30% people are enjoying the boom of GDP
50%. On the other hand 50% people involved in agriculture enjoys less portion of GDP

Human Development Index (HDI)

Human Development Index (HDI)
→ GDP is not a good measure of development.
↓
Focuses on economic development

Human Development: Enlarging people's choices.

"valued"

choices may be → valued across globe

- Income
- Free speech
- Democracy
- Education
- Health
- Sanitation
- Free Mobility

Indicators to measure human development Index

- 1 → Income
2 → Education
3 → Health } Universally accepted valued choices
(HDI indicators)

Income is measured in terms of per capita income
For most south-A

Income countries
Education → Adult Literacy Rate (Self Reported literacy Rate)
→ Gross enrollment in primary education

* 1990's global human development report by
UN

Indicator

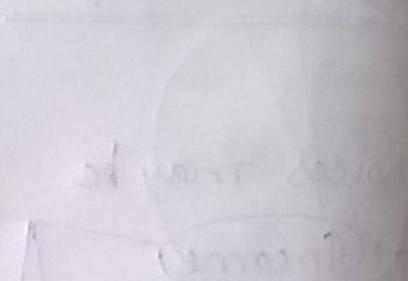
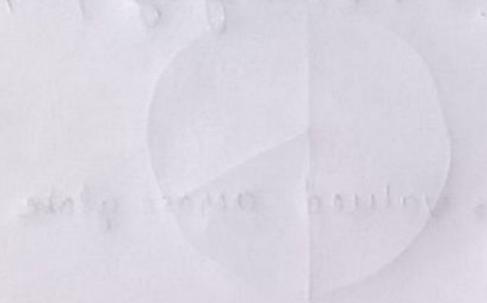
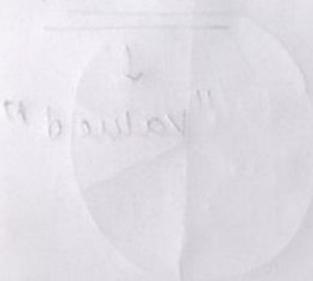
Income

Education

Health

Measurement

per-capita income



per capita income measured in terms of purchasing power parity (PPP) adjusted for inflation.

World Bank's International Comparison Program (ICP) (2011)

market exchange rates
with subsidies
without taxes

adjusted for purchasing power parity (PPP) and inflation.
The ICP is a global survey of living standards and
is conducted every five years by the World Bank.
The survey measures the cost of a basket of goods
and services in different countries, including food,
clothing, housing, transportation, and leisure.

Date of consumer 06/02/17

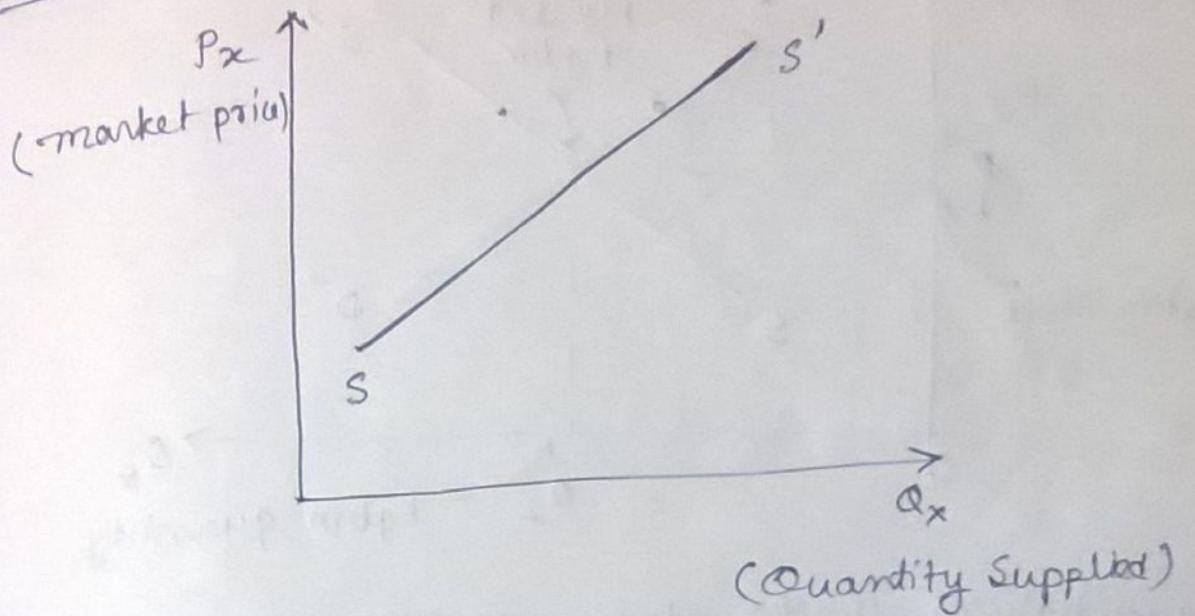
Dynamic demand factor

$$Q_x = f(P_x, I, P_{c,s}, T)$$

Income
 Price of
 x
 Price of
 complementary
 or substitute
 goods

Band wagon

Supply

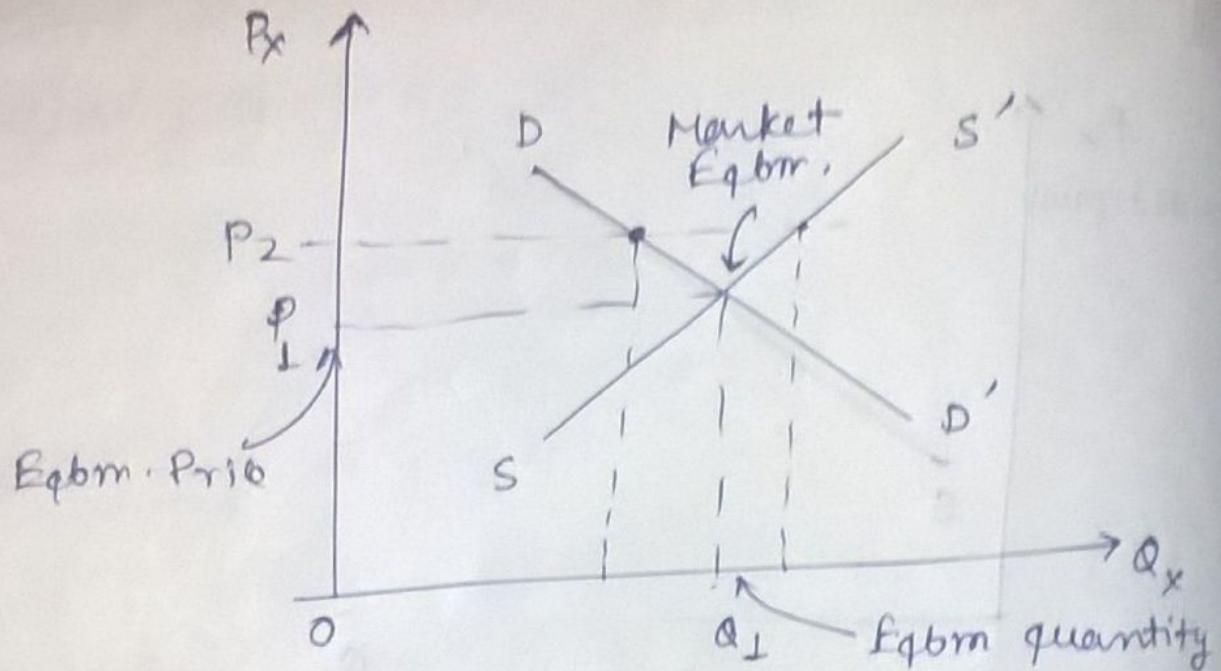


considered for small duration and other conditions to be constant

- $Q_x = f$
- Break even point & shut down point

Q_x : Factors

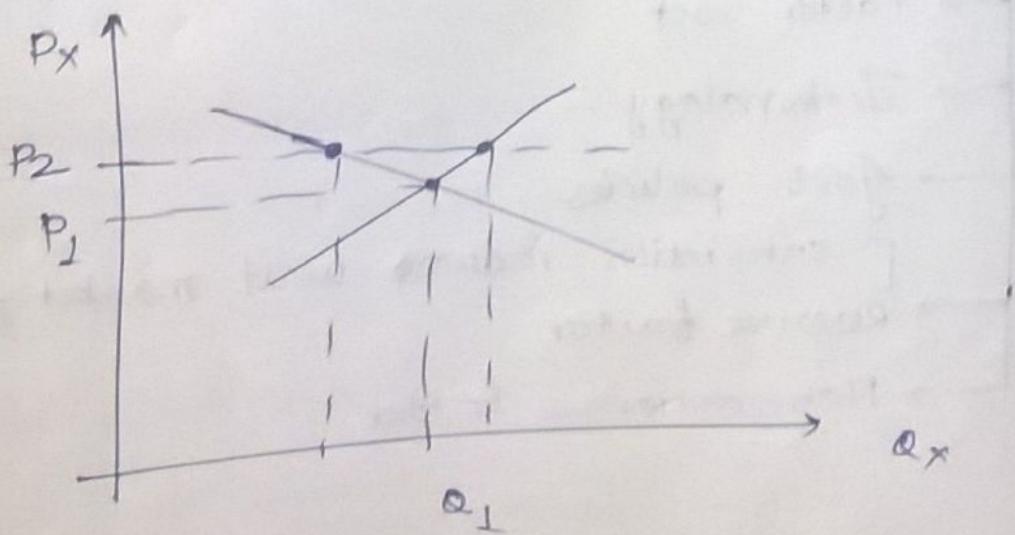
- Factor cost
- Technology
- Govt. policies
 - [subsidies reduce unit market price]
- Reserve factor
- Non economic factor



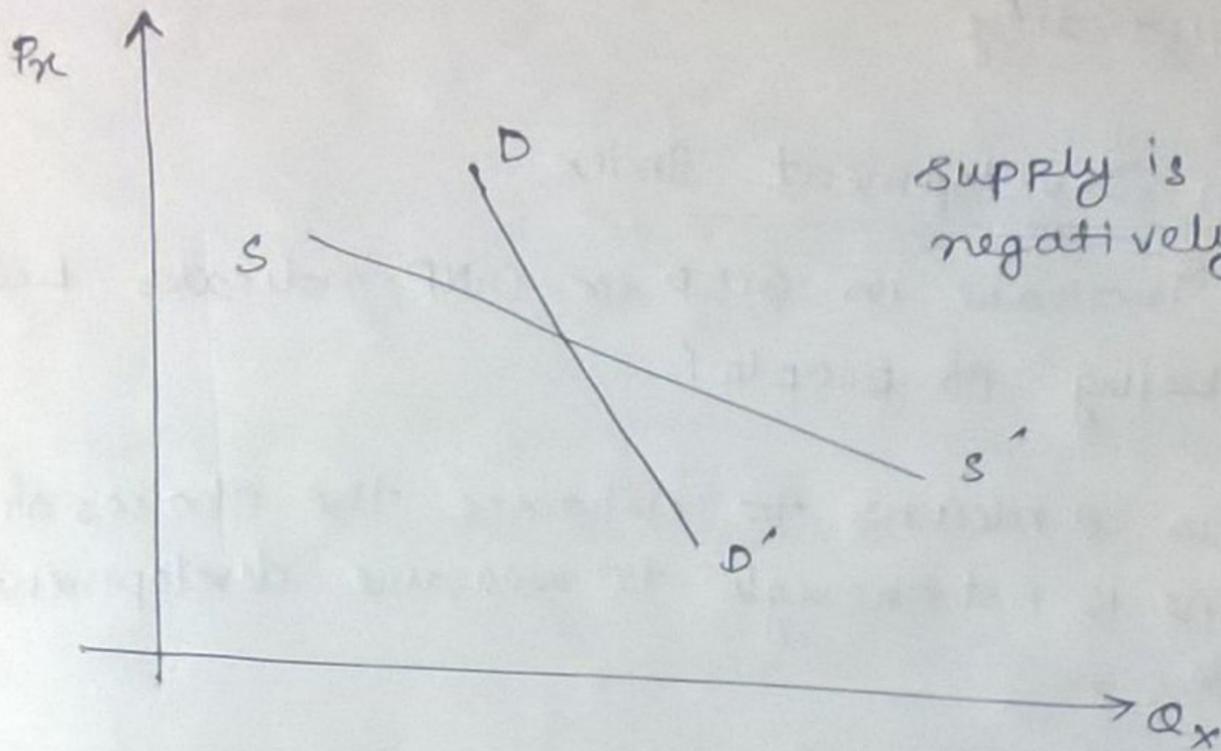
Equilibrium under static economy

- ① Stable Eq.bm.
 - ② Unstable "
 - ③ Neutral "
- * monopolies can not fix any price.

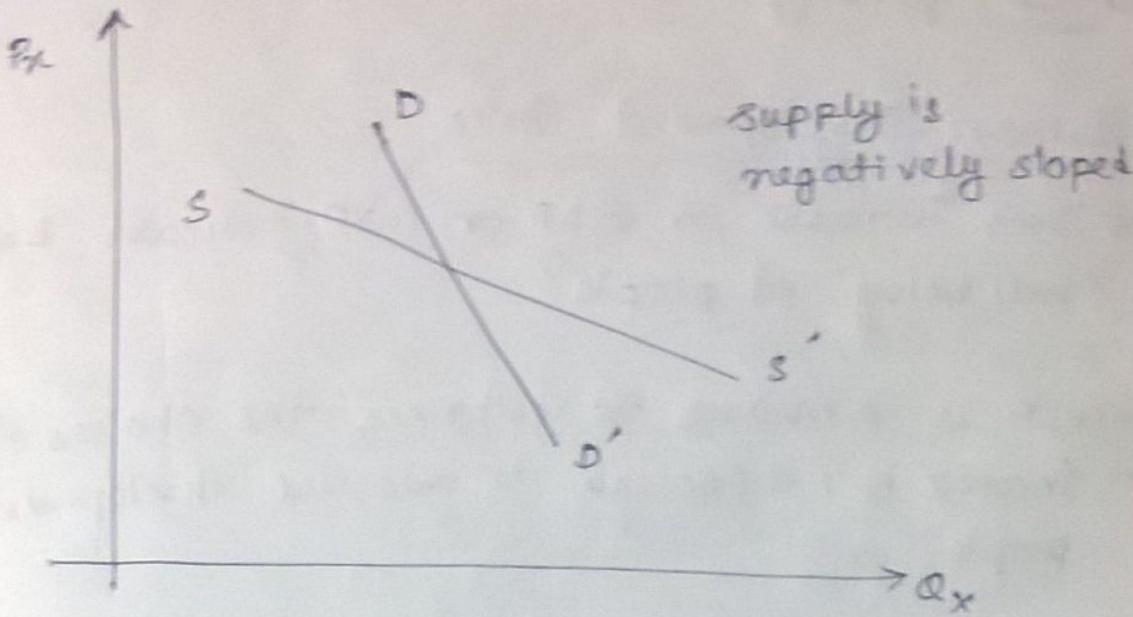
① Stable



Unstable Eqbm.



② Unstable Eqm.



07/02/16

B.K. Sahoo

~~Wise~~

Paasche's Price Index
Laspeyres price index

weights used
in different

Commodities

$$[PI]_L = \frac{\sum q_{ib} p_{it}}{\sum q_{ib} p_{ib}}$$

~~Products~~

$$[PI]_P = \frac{\sum q_{it} p_{it}}{\sum q_{it} p_{ib}}$$

~~Laspeyres~~

		x	y	
		q	10	20
		p	5	10
2010	(Base)			
		q	8	25
		p	10	10
2017				

$$PI(L) = \frac{10 \times 10 + 20 \times 10}{10 \times 5 + 20 \times 10} = \frac{6}{5} = 1.2$$

Inflation rate = 20%.

$$PI(P) \approx 1.3 \Rightarrow \text{Inflation rate } 10x\% \\ = 1.3$$

Fisher's price index = $\sqrt{1.2 \times 1.3}$

Base quantity

Human Development Index

Does increase in GDP or GNP indicates better "well being" of people?

- GDP is a means to enhance the choices of people.
- Income is not enough to measure development of people.
- People's development is measured by Human Development Index.
- Human development is a process of enlarging people's choices and also level of achievements.
- Increase their capability to value their life, they are living.

Dimensions leading to enlarging people's choices

- Long and healthy life:
 - knowledge
 - Standard of living
 - Free speech
 - Employment
 - Political Participation
- } Universally valued

Dimensions

→ Long and healthy life
(Health)

Indicators

- Life expectancy at birth (years)
- BMI (Body mass index)
- Under 5 mortality Rate
- Infant mortality rate

Life expectancy at birth is the chief indicator including other factors.

→ knowledge
(Education)

- Years of schooling (years)
- Literacy rates
- Enrollment rates
- % of population in primary school

1990 United Nations Development Programme considers adult literacy rates and enrollment in primary education were considered as ~~not~~ indicator

In 2017, the indicators are years of schooling, expected years of schooling

→ Standard of living
(Income)

→ per capita income (\$)

Health & education index =

$$\frac{\text{Actual value} - \text{Minimum value}}{\text{Max. value} - \text{Min value}}$$

The formula is used to measure health and education in unit free quantity

→ Life expectancy → 80 yrs.

→ Years of schooling → 15 years
Expected ^{years} of n → 18 years

Goal post

<u>Maximum</u>	<u>Maximum</u>	<u>Minimum</u>
Life expectancy	85	20
Years of schooling	18	0
Expected years of schooling	15	0
per capita income	\$ 75,000	\$ 100

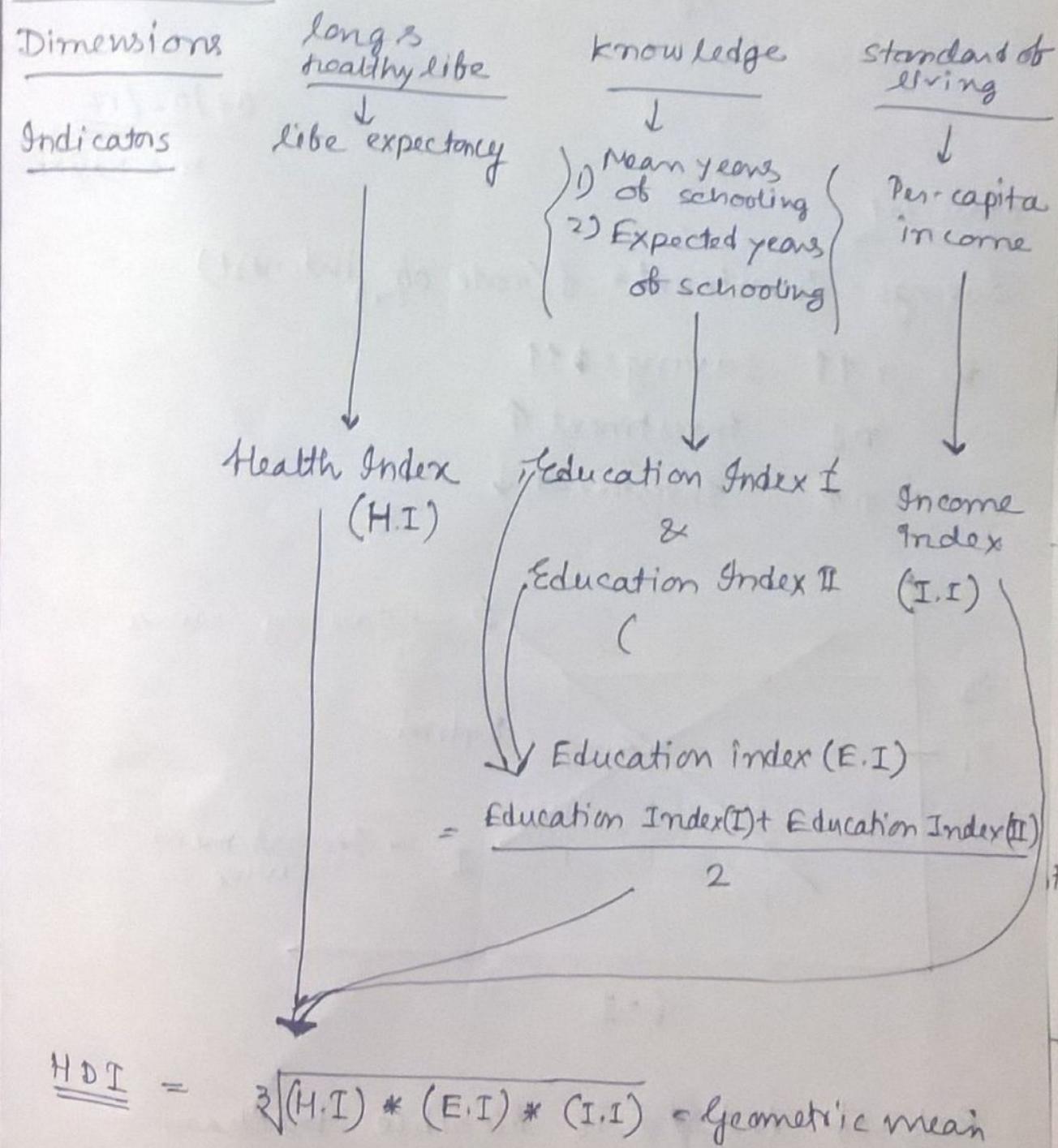
<u>Individual</u>	<u>Year of schooling</u>	<u>Age</u>
1	0	15
2	0	6
3	0	8
4	0	70
5	5	35
6	3	25
7	17	22
8		
9		
10		

For income index

$$= \left[\frac{\ln(\text{Actual value}) - \ln(\text{minimum value})}{\ln(\text{max. value}) - \ln(\text{min. value})} \right]$$

goal post is the achievement goals of a country

At a glance



1990 - 2010 : HDI is calculated as

$$H.D.I = \frac{(H.I) + (E.I) + (I.I)}{3} \quad (\text{Arithmetic mean})$$

Economics Survey: Chapter-I → Syllabus for class test
+
class notes prior Feb 7th
Syllabus for midsem

07/02/17

Classical

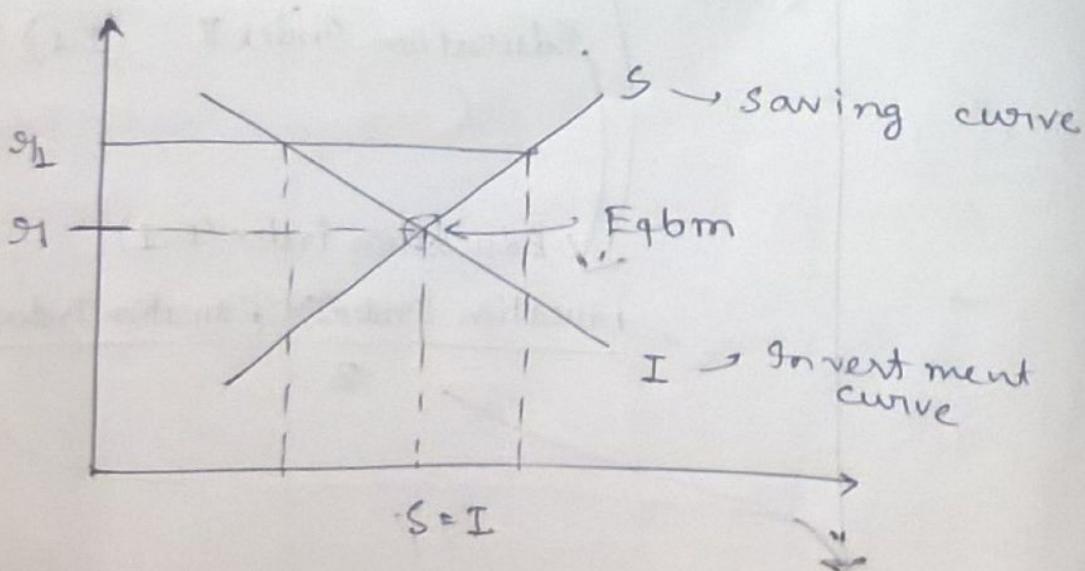
N.C. Nayak

Savings = Investment = $f(\text{rate of interest})$

~~↑~~ \rightarrow ↑ savings \rightarrow ↑

$r \downarrow$ Investment ↑

$r \uparrow$ Investment ↓



Rate of interest is flexible mechanism

Saving > Investment, $r_1 \uparrow \downarrow$

Saving < Investment, $r_1 \uparrow$

\Rightarrow Rate of interest being rigid, may lead to eqbm.

Rate of interest is not the only factor of investment

$I = f(MEC, r_1)$ \rightarrow opportunity cost/bond rate/interest rate

$MEC > r_1 \rightarrow$ to attract investment

Opportunity cost: When own money is invested, the interest obtained on the capital from the bank, is sacrificed. This is called opportunity cost.

\rightarrow Some of the states are more industrialized compared to others because of the fact that $MEC > r_1$ for those industrialized states.

In keynsian approach, rate of interest is fixed.

~~For~~ MEC does not get determined by rate of interest

Needs to ensure $MEC > r_1$ \checkmark Theoretically \checkmark

Difference between MEC and r_1 or margin of profit, ultimately matters investment

Higher the margin of profit \Rightarrow higher the
Investment

What determines MEC ? (Factors are infinite
not exhaustive)

1. Infrastructure
2. Labour standard
3. Governance
4. R & D
5. Location
6. Human capital

$$(C+S+T) = I + G$$

↓
Household

Saving is leakage & Investment is injection

For household

For economic/financial firms

Export - injection

Import - leakage

	P	Q	Nominal GDP	Real GDP	GDP deflator	Index
2014	10	10	100	100	1	100
2015	20	10	200	100	2	200
2016	30	10	300	100	3	300

Base year - 2014

1) Frictional unemployment \Rightarrow A person who leaves a job and look for another. The duration between those two jobs is called frictional unemployment.

2) Seasonal unemployment \rightarrow Due to technology development.

3) Cyclic unemployment \rightarrow During recession

Natural unemployment \Rightarrow Frictional + Seasonal unemployment

~~Monetary~~ policy \rightarrow RBI

Physical policy \rightarrow Govt

27/02/12
N.C. Nayak

Multiplicator

$$Y = C + I$$

↓

Private consumption demand
Private investment
demand for
consumer goods

\rightarrow Public Investment: PSUs.

$G_I =$ Induced Investment + Govt. autonomy

$$I = a + \beta y$$

↓

autonomous Induced.

β - should be low in case of recession

$C = a + by \Rightarrow$ Consumption function

$S = -a + (1-b)y \Rightarrow$ Saving function

$$S_t = D_{t+1}$$

Expected demand } in case of program

\rightarrow Forward looking behavior

$$S_t = D_{t-1} \rightarrow$$
 In case of recession

Indian govt. has always presented deficit budget.

\Rightarrow Govt. expenditure $>$ Govt. income.

monetized deficit. → leads to ~~inflation~~ inflation



RBI can lend money to central govt. They print money in order to supply to the deficit in budget of central govt.

$$\Delta Y = \underbrace{K \Delta I}_{\text{multiplier}}$$

In times of recession govt. should play a vital role to increase the autonomous investment. Govt. has to invest regardless of prob.

Autonomous investment
↓ should be made in times of recession.
Public utilities.



By this, the private investors may come forward to invest.

$$Y_1 = C_1 + I_1 = \underbrace{a + b Y_1}_{C_1} + I_1$$

$$Y_2 = C_2 + I_2 = \underbrace{a + b Y_2}_{C_2} + I_2$$

$$Y_2 - Y_1 = b(Y_2 - Y_1) + (I_2 - I_1)$$

$$\Delta Y = b \Delta Y + \Delta I$$

$$\Delta Y (1-b) = \Delta I$$

$$\Delta Y = \frac{1}{(1-b)} \Delta I = K \Delta I$$

$$K = \frac{1}{1-MPC}$$

$$K = \frac{1}{MPS}$$

$$C = 20 + \frac{3}{4}Y$$

↓
MPC

$$K = \frac{1}{1 - \frac{3}{4}} = 4$$

$$0 < b < 1$$

$$1 < K < \infty$$

$$C = a + by$$

$$I = a_1 + b_1 y$$

$$G = a_2 + b_2 y$$

Investment multiplier.

$$K = \frac{1}{1 - b - b_1 - b_2}$$

$$\Delta Y = K \Delta D_a$$

28/02/17
N.C. Nayak

Autonomous demand

$$K = \frac{1}{1 - b - b_1 - b_2}$$

$$C = a + by$$

$$I = a_1$$

$$G = a_2$$

MPC ↑↑ K ↑↑

MPS ↑↑ K ↓↓ \Rightarrow Saving is leakage

- For a prosperous economy, MPC or APC is less while MPS or APS is high.
- In India huge amount of income is consumed in consumer goods. So, unaffected by recession
- Multiplier effect $M \Rightarrow$ seeks investment

In general

$$K = f(MPC, M \text{ propensity to Invest}, M \text{ propensity to govt. purchase})$$

Period	ΔI	$\frac{1}{2} \alpha X$ $(\frac{\Delta C}{\Delta Y})$	ΔY	$\sum \Delta Y$
1	1000	500	1000	1000
2	—	250	500	1500
3	—	125	250	1750
...	—	—	—	—
t	—	—	—	~ 2000

Multiplier is an infinite series. It forms a decreasing G.P. Thus after sufficiently long time $\Delta Y \approx K \Delta I$.

Depends on how quickly goods are produced and consumed i.e. how quickly money changes hand.

If ΔI is temporary / once-over type

<u>Period</u>	<u>I</u>	C	$\frac{I}{20}$	$\frac{\Delta I}{20}$	$\frac{\text{total spending}}{\text{total output}}$	$\frac{Y}{160} = \frac{4}{4}$	<u>Planned I</u>
1	20	140	-	-	$160 = 160$	-	$20 = 20$
2	20	140	-	-10	$170 > 160$	$160 - 20 = 20$	< 30
3	20	140	-	-7.5	$167.5 < 170$	$160 + 10 = 22.5 > 20$	> 20
4	20	140	-	-5.6	$165.6 < 167.5$	$160 + 7.5 = 21.9 > 20$	> 20
t	20	140	20	~ 0	$160 = 160$	$160 \sim 0 = 20$	$= 20$

After sufficient long time

$$C = 20 + \frac{3}{4}Y = 140$$

$$I = 20$$

$$Y = C + I = 20 + \frac{3}{4}(Y + 20), Y = 160$$

Dynamic multiplier

Realised I

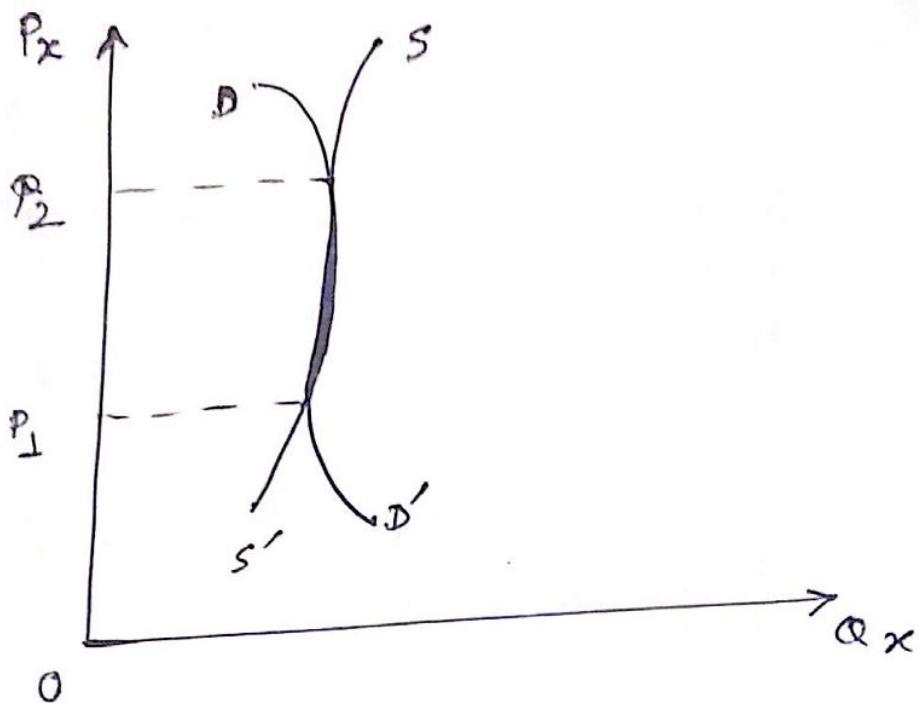
\Rightarrow planned I + unplanned I

Saving = investment

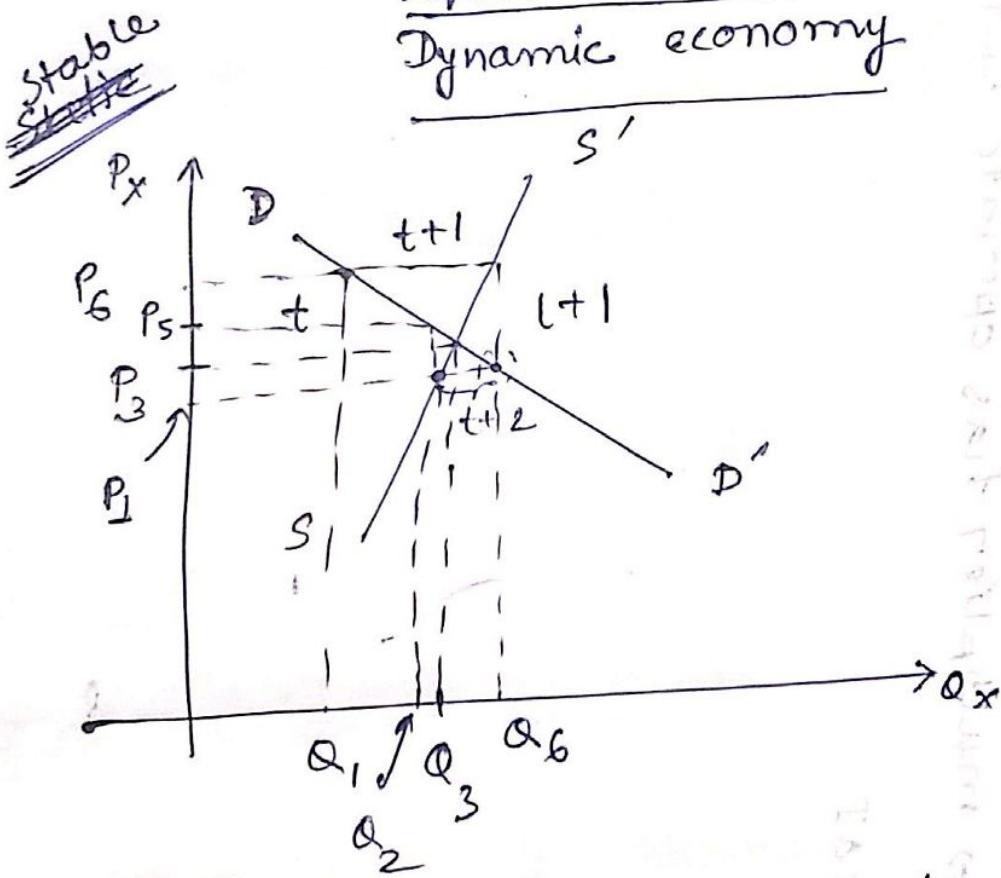
* Demand is more. Now the inventories will be cleared & no make the surplus demand fulfilled.

* Demand is less. Surplus supply will go to inventory
In this case \Rightarrow multiplier has operate but in transient states

$$\sum \Delta Y = k \Delta T$$

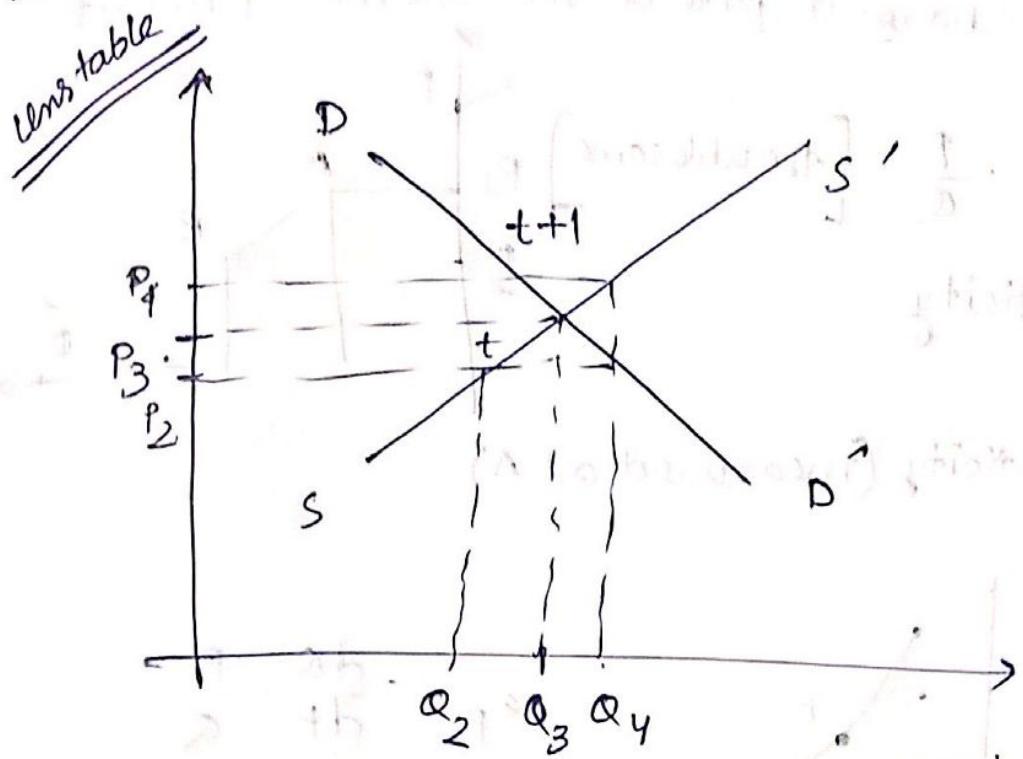


Eqlbm. under
Dynamic economy



Demand in $(t-1)$ influences supply in t . Thus when supply is increased to meet demand price reduces and when supply is decreased, price increases relative to eqbm. price.

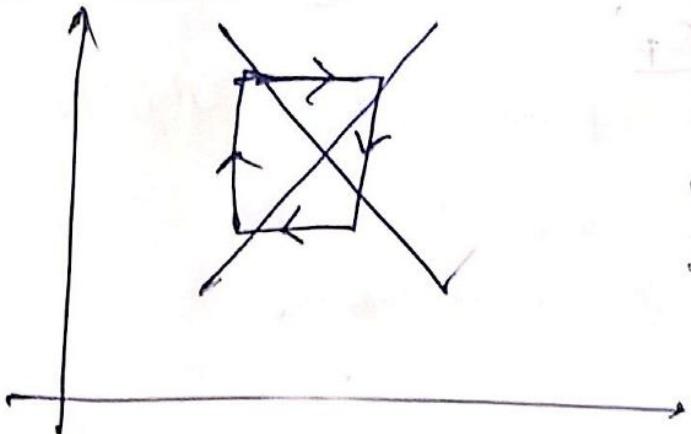
If slope of demand curve is less than supply curve, eqbm position is attained after some time.



The movement is like

So, if slope of demand curve is more than supply curve, eqbm. position is not attained as price diverges from eqbn. price.

Oscillating



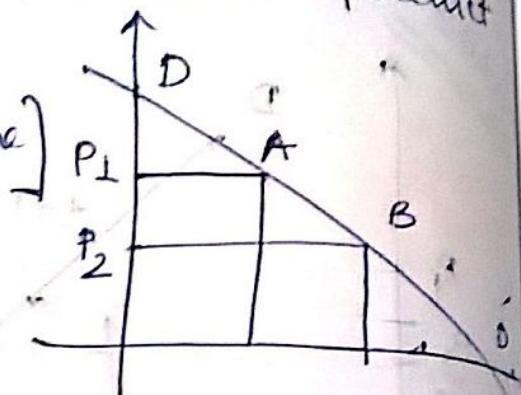
Slope of demand
curve = slope of
supply curve.

Price elasticity of demand

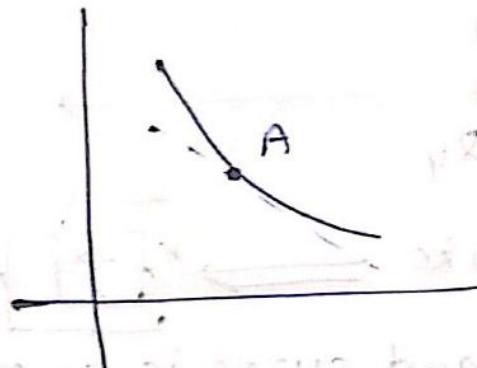
$\theta_p = \frac{\% \text{ change in quantity demand for a product}}{\% \text{ change in price of the same product}}$

$$e_p = -\frac{\Delta Q}{\Delta P} \cdot \frac{P}{Q} \quad [\text{troublesome}]$$

Arc elasticity



Point elasticity (measured at A)



$$e_p = -\frac{dQ}{dP} \cdot \frac{P_1}{Q_1}$$

$$Q = a - bp$$

$$e_p = -b \frac{P}{Q}$$

$$Q = ap^{-b}$$

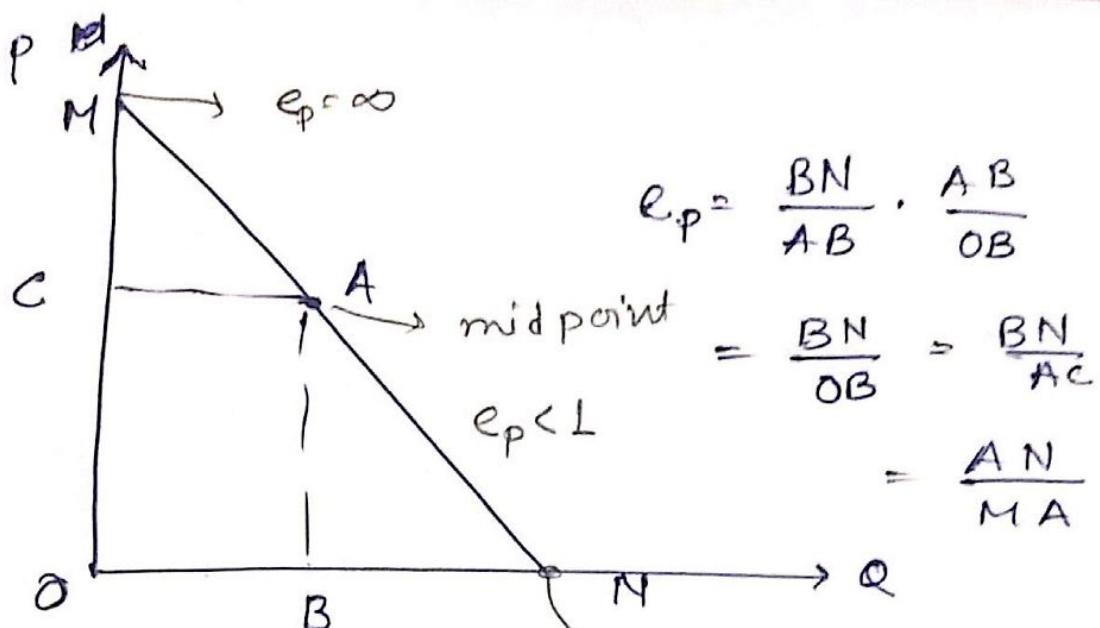
$$e_p = -abp^{-b} \frac{P}{Q}$$

$$\boxed{e_p = -b}$$

Factors affecting e_p

→ % of income spent on commodity

→ Nature of good. Essential goods → inelastic
luxury goods → highly elastic



$$e_p = \frac{\text{Lower segment}}{\text{upper segment}}$$

$$e_p = 0$$

\Downarrow
No relation
between price
and quantity
demanded.

Elasticity concept is applicable to any product.

Commodities like salt, matchbox are relatively inelastic

Period	C	I	ΔC (billion)	ΔI	total spending \geq total output	Y	ΔY	Realised I	$\frac{\text{Planned } I + \text{Unplanned } I}{\text{Planned } I}$
1	140	20	-	-	160 = 160	160	-	20	= 20
2	140	20	-	10	170 > 160	160	-	20	< 30
3	140	20	7.5	-	167.5 < 170	160	10	22.5	> 20
4	140	20	5.6	-	165.6 < 167.5	160	7.5	21.9	> 20
5	140	20	4.2	-	164.2 < 165.6	160	5.6	21.4	> 20
...									
t	140	20	0	0	160 = 160	160	0	20	= 20

If change in investment is once-over

05/03/14
NC Naujan
Type / Stamp

$$C = 20 + \frac{3}{4}Y \quad , I_1 = 20 \quad I_2 = 30 \quad \Delta I = 10 \rightarrow \text{for period 2}$$

$$Y = 20 + \frac{3}{4}Y + 20$$

$$Y = 160$$

$$C = 20 + \frac{3}{4}Y = 140$$

$$S_t = D_{t-1}$$

There is a time lag between demand and supply.

To meet the excess demand, inventory investment is utilised.

Realised investment = planned investment + unplanned investment

at eqbm demand-supply situation planned $I = \text{Realised } I$

at dis-eqbm " " " planned $I \neq \text{Realised } I$

Change in income is consumed during the transition. $\sum \Delta Y = b \Delta Y$

declining income leading to declining demand.

The sum of the decreasing G.P series.

With single increase in investment, the growth is temporary but not sustained for a longer period of time, as desired.

1	140	20	-	-	160	=	160	160	-	20	=	20
2	140	20	-	10	170	>	160	160	-	20	<	30
3	140	20	7.5	10	177.5	>	170	160	10	22.5	<	30
4	140	20	13.1	10	183.1	>	177.5	160	17.5	24.4	<	30
5	140	20	17.3	10	187.3	>	183.1	160	23.1	25.8	<	30
	140	20	30	10	200	=	200	160	40	30	=	30

If change in investment is permanent/continuous

Deficit in supply-demand will be met by clearing inventory

Continuous increase in investment leads to increasing total spending and increasing total input until a new level in income is attained.

If ΔI is temp.

$$\Delta Y_1 = \Delta I$$

$$\Delta Y_2 = \Delta C_2 \xrightarrow{\text{change in consumption}} = b\Delta Y_1 \\ = b\Delta I$$

$$\Delta Y_3 = \Delta C_3 = b^2 \Delta I$$

$$\vdots \\ \Delta Y_t = b^{t-1} \Delta I$$

If ΔI is ~~permanant~~ permanent

$$\Delta Y_1 = \Delta I$$

$$\Delta Y_2 = \Delta I + b\Delta I$$

$$\Delta Y_3 = \Delta I + b\Delta I + b^2 \Delta I$$

!

$$\Delta Y_t = \underbrace{\Delta I + b\Delta I + b^2 \Delta I + \dots + b^{t-1} \Delta I}_{\text{Sustainable}}$$

For permanent AI, there will be a change in income level permanently.

07/03/17

B.K. Sahoo

Human Development Index

<u>Dimension</u>	<u>Indices</u>
Income	Per capita income → Income index
knowledge	① Mean years of schooling → Edu. Ind. ② Expected years of schooling → Edu. Ind.
Health	Life expectancy at birth → Health index

Diminishing Returns of income to transferring to human capabilities

$$\text{HDI} = \frac{\text{Education Index I} + \text{Education index II}}{2}$$

After, 2010,

$$\text{HDI} = (\text{II} * \text{EI} * \text{HI})^{1/3}$$

Before, 2010,

$$\text{HDI} = \frac{\text{I.I} + \text{E.I} + \text{H.I}}{3}$$

1990

UNDP
↓

Borrowed from the concept of Amartya Sen

Capabilities and Functionings

↓
Freedom of choices

↓ Achievements

commodities (Resources : all commodities together)

→ All commodities have some desirable properties known as characteristic

Food induces good health, but with some digestion disabilities i.e. lack of functioning, he might not claim all the usefulness of food.

The personal utilisation → Functioning i.e.
Achieving good health

Resources : → food

Capability → freedom of choice

Functioning → varies person to person

x_i : commodity vector owned by individual ' i '

$c(\cdot)$: characteristic vector of commodity ' \cdot '

$f_i(\cdot)$: personal utilization function of individual ' i ', which the individual uses

$F_i(\cdot)$: set of all $f_i(\cdot)$

$h_i(\cdot)$: Happiness function of individual ' i '

$v_i(\cdot)$: valuation function \Leftrightarrow ' i '

X^* : Endowment set of all commodities / resources

$$x_i = \{Book\}^{bicycle}$$

$$c = \{K, RP, LP\}$$

$$f_i = \{RA, LA, CA, \dots\}$$

$$f_i = \{RA\}$$

$$b_i = f(c(x_i)) \rightarrow \text{Achievement}$$

\Downarrow Book
knowledge
acquiring
(K)

$$b_i = job$$

$$b_i = f(c(x_i)) \rightarrow \begin{matrix} cycling \\ ability \end{matrix} \rightarrow \begin{matrix} bicycle \end{matrix}$$

$$\Downarrow \text{Ability of cycle}$$

$$= mobility$$

$$P(x) = \{b_i \mid b_i \text{ for } x_i \in x\}$$

$$P(x) = \{job, mobility\} \rightarrow \text{Functioning}$$

$$Q(x) = \{b_i \mid b_i \text{ for } x_i \in x \text{ and } f_i \in F_i\}$$

$$Q(x) = \{job, LP, mobility\} \rightarrow$$

Freedom of choices

"

capability set

All possible things
that can be done
with endowment
set x , representing
~~choice~~ freedom
of choices

$$P(x): \{Job, mobility\}$$

$$Q(x): \{Job, LP, mobility\}$$

Book: "commodities & capabilities" by Amartya Sen

Balance of Payment (BoP)

$$GDP = C + I + G + \underbrace{(X - M)}_{\text{The net export to abroad}}$$

Exports: $X \rightarrow$ Foreign spending on domestic goods & services

$M \rightarrow$ Domestic spending on foreign goods and services

$X > M \rightarrow$ surplus

$X < M \rightarrow$ deficit

$X = M \rightarrow$ balance

BoP \Rightarrow Accounting of a country

Double entry book keeping

Flow of cash inward \rightarrow credit

" " outward \rightarrow debit

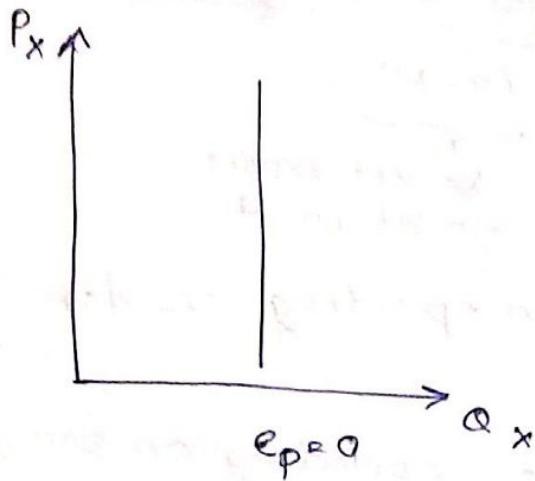
Import \rightarrow debit

Export \rightarrow credit

① Current account

② Capital account

③ Errors and omission



07/03/17
R. Goswami

→ Proportion of income spent on a commodity.
 e.g Match box → 1 Re → 2 Re. → still purchases one box
 $AC \rightarrow 30K \rightarrow 60K \rightarrow$ Demand reduces drastically.

→ Total revenue

$$TR = P \cdot Q$$

$$AR = \frac{TR}{Q} = P$$

→ Average revenue

$$MR = \frac{d(T.R)}{dQ} = \frac{d(PQ)}{dQ} = P$$

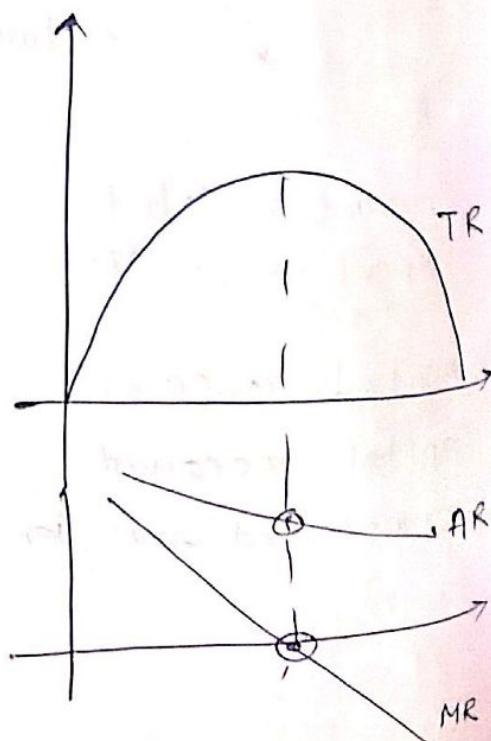
→ Marginal Revenue

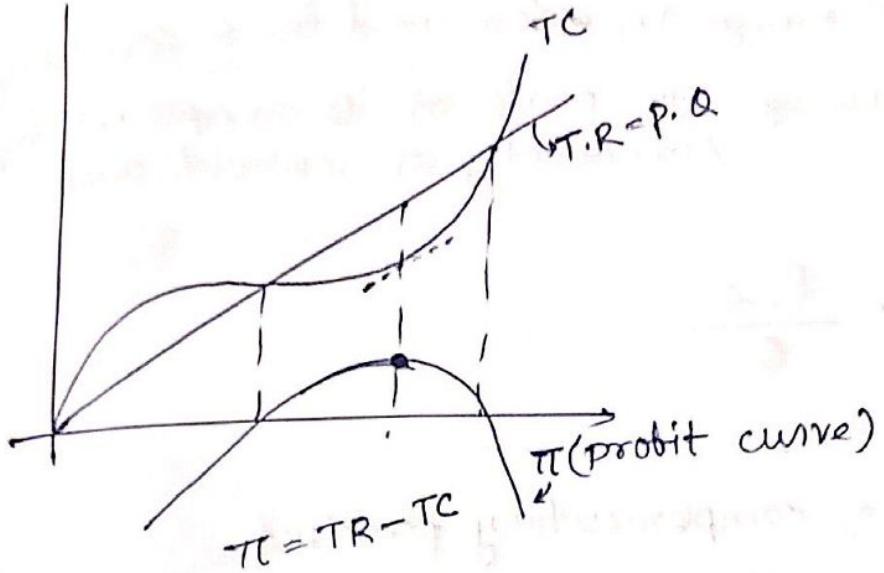
$$MR = P + Q \frac{dP}{dQ}$$

$$MR = P \left(1 + \frac{Q}{P} \frac{dP}{dQ}\right)$$

$$= P \left(1 - \frac{1}{e}\right)$$

$$MR = AR \left(1 - \frac{1}{e}\right)$$



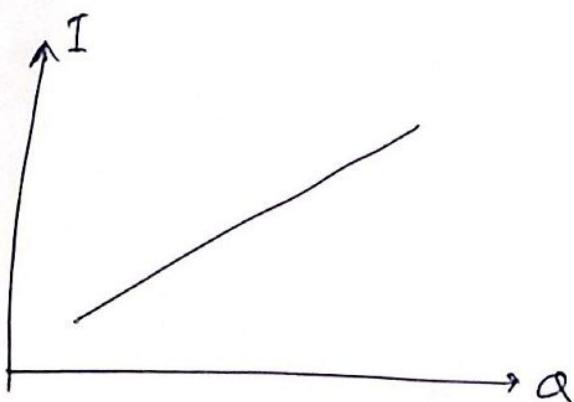


Income elasticity

$e_I = \frac{\% \text{ change in qty demand for a product}}{\% \text{ change in income of the consumer}}$

income elasticity (e_I)

$$= \frac{dQ}{dM} \cdot \frac{M}{Q} \rightarrow \begin{matrix} \text{disposable income} \\ (\text{after tax income}) \end{matrix}$$



$e_I \rightarrow$ used to determine nature of product
 ↓

Useful to estimate a rough idea after certain time of demand. Thus in advance idea may help to expand production facility.

Cross Elasticity of demand

$e = \frac{\% \text{ change in demand for a commodity}}{\% \text{ change in price of its complementary commodity or subsidiary}}$

$$e = \frac{dQ}{dP_{S,C}} \cdot \frac{P_{S,C}}{Q}$$

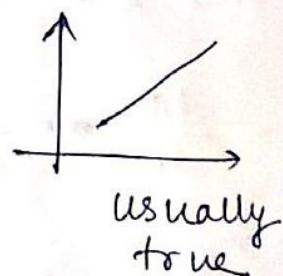
$e \rightarrow -ve \Rightarrow$ complementary product

$e \rightarrow +ve \Rightarrow$ substitute product

Elasticity of supply

$e_s = \frac{\% \text{ change in supply for a commodity}}{\% \text{ change in price of the commodity}}$

$$e_s = \frac{dQ_s}{dP} \cdot \frac{P}{Q_s} \leftarrow \begin{matrix} \text{quantity} \\ \text{supplied} \end{matrix}$$



$es = \frac{\% \text{ change in price of the commodity}}{\% \text{ change in quantity}}$

$$= \frac{dOs}{dP} \cdot \frac{P}{Os}$$

+
usually
true

- * production is the value addition to the input to produce output.
 - anything that goes to production
 - that comes out (~~XXIV~~)
- * other types of inputs for production -
 - Labour
 - Production:
 - Short Run: A certain time period some inputs may be fixed and some may be variable.
 - Long Run: certain time period, where inputs are variable.
- * In our analysis, we consider two types of inputs - labour and capital.

Labour → Casual/Daily
→ Permanent

* $Q = f(L, K)$

output Labour

capital
(represents all
~~into~~ inputs, that
can be fixed)

Assumptions:

- ① Inputs and outputs are perfectly divisible.
- ② (small amount of labour and capital can be used to produce small amount of output)
- ③ Inputs are homogeneous in nature (Labor and Capital each one has similar efficiency).
- ④ Short Run: one input is fixed and one input is variable.

$$Q = f(L, K)$$

L , fixed capital
(inelastic in nature)

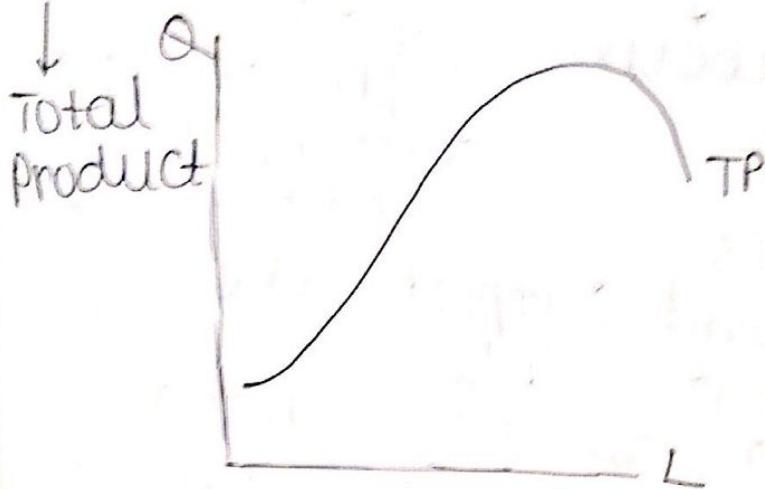
i.e. change in output and ~~will~~
labor don't change capital).

Long Run: Both inputs are variable.

* Short Run Production Process

$$Q = f(L, \bar{K})$$

Ex:
 $\frac{\partial Q}{\partial L} = -L^2 + 15L + 10$



Average Product (AP)

$$AP_L = \frac{TP}{L} = \frac{Q}{L}$$

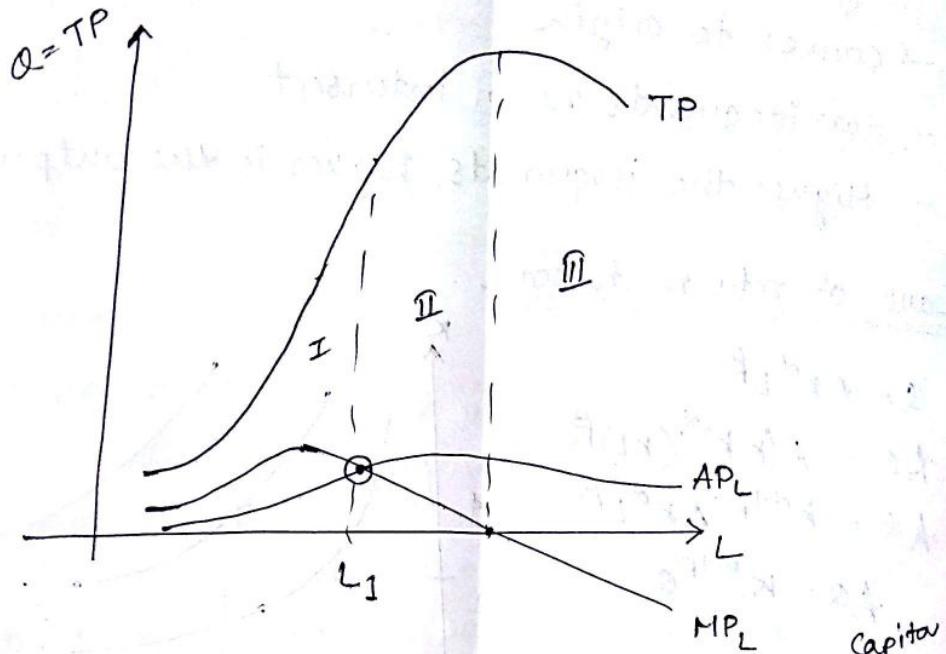
$$MP_L = \frac{dQ}{dL}$$

↳ Marginal product

20/03/17

K. Goswami

$$Q = -L^3 + 15L^2 + 10L$$



$$AP_L = \frac{TP}{L} = \frac{Q}{L}$$

$$MP_L = \frac{dQ}{dL}$$

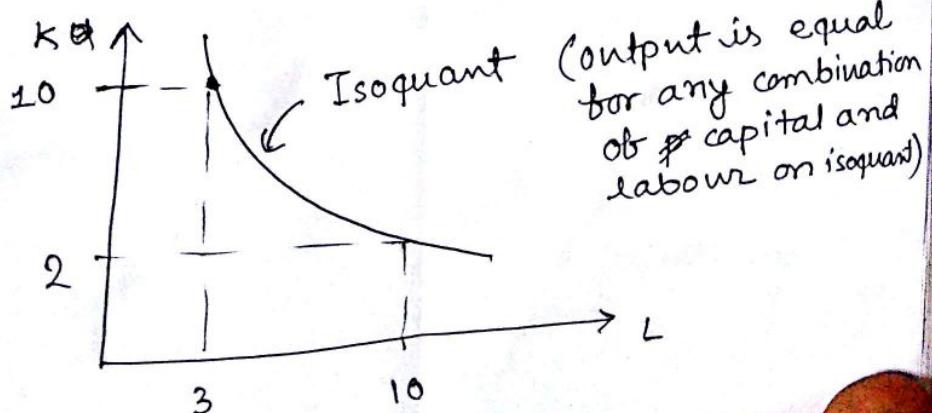
Short run $Q = f(L, K)$

long run $Q = f(L, K)$

Law of diminishing marginal return

In stage III, TP as well as MP_L is diminishing.
In this stage MP_L is lower than even AP_L

Long Run Situation



Isoquants are

- Negatively sloped
- convex to origin
- two isoquants never intersect
- Higher the isoquants, higher is the output.

Laws of returns to scale:

$$Q = AK^\alpha L^\beta$$

$$\frac{\partial Q}{\partial K} = A(KK)^\alpha (KL)^\beta$$

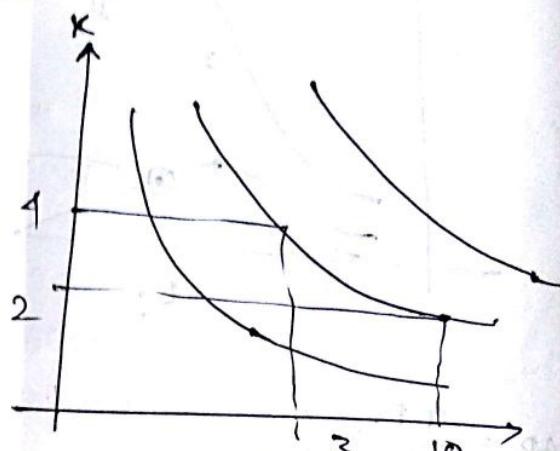
$$\frac{\partial Q}{\partial L} = K^{\alpha+\beta} AK^\alpha L^\beta$$

$$\frac{\partial Q}{\partial K} = K^{\alpha+\beta} Q$$

If $\alpha+\beta > 1$, $\frac{\partial Q}{\partial K} > K$

$\alpha+\beta = 1$, $\frac{\partial Q}{\partial K} = K$

$\alpha+\beta < 1$, $\frac{\partial Q}{\partial K} < K$



Law of increasing returns to scale

" " constant "

" " decreasing "

Cobb-Douglas Production Function

$$Q = AK^\alpha L^\beta$$

one

III
PC

Three

→ C/D

→ Stc

→ U

Roser

F

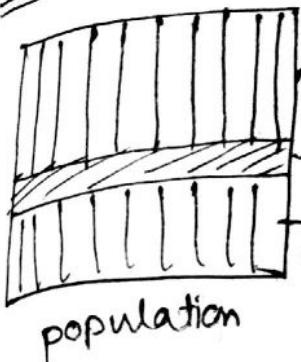
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Unemployment

21/03/17

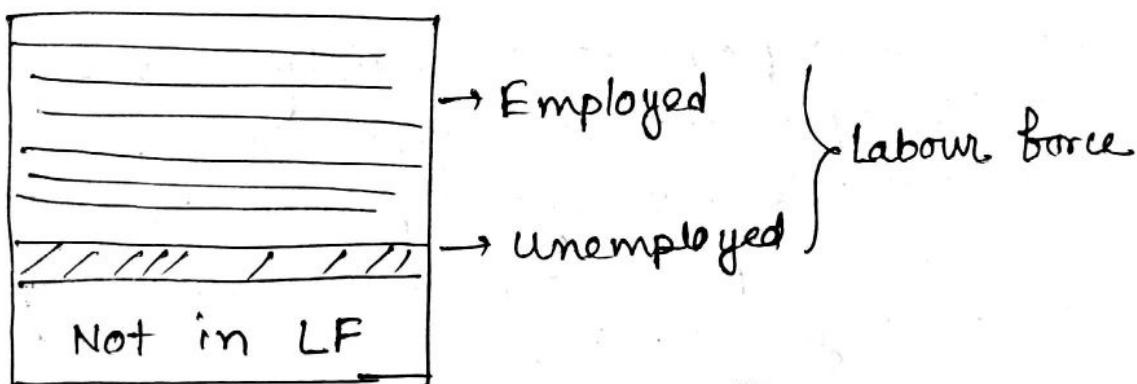
B.K. Sahoo



Three objective

- GDP growth i.e. economic growth
- stabilization / Inflation controlling
- Unemployment control.

Reservation wage



$$\text{Unemployment rate (UR)} = \frac{\text{Number of individuals willing to work}}{\text{Labour Force}}$$

↓ ↓

Voluntary In-voluntary

is not considered considered as unemployment

- ① Structural unemployment /
 - ② Frictional unemployment } Developed economies
 - ③ Seasonal unemployment } underdeveloped /
 - ④ Disguised unemployment developing economies
- ↓
Applicable for India
and most of the countries

- ① Unemployment rising due to structural transformation is called structural unemployment
- ② During crisis period, unemployment arises due to the fact that workers are asked to leave the job, named as frictional unemployment
- ③ Seasonal unemployment → mainly seen in economies dependent on agriculture. Employment is only available during the period of production of crops. Same applies for winter garments manufacturing companies.
- ④ Disguised unemployment ⇔ Under employment

↓
People are working but no output. These kind of people have marginal productivity to be zero. They have no contribution to the total output.

Unemployment arising in Keynesian Economics is majorly frictional unemployment.

economics

2nd /
economics

for Indian

transformation

due to
the job.

is in
Employment
production
cuts

employment

rise
vity to
e total

mics

Labour Supply

$$\text{Max. } U = f(\cdot)$$

utility f^u

Subject to
budget

$$U = f(x_1, x_2) \rightarrow P_1 x_1 + P_2 x_2 = M$$

$$U = f(c, L)$$

commodity

leisure

wage rate: w , total time = T

working hours: $(T-L)$

Labour income: $w(T-L)$

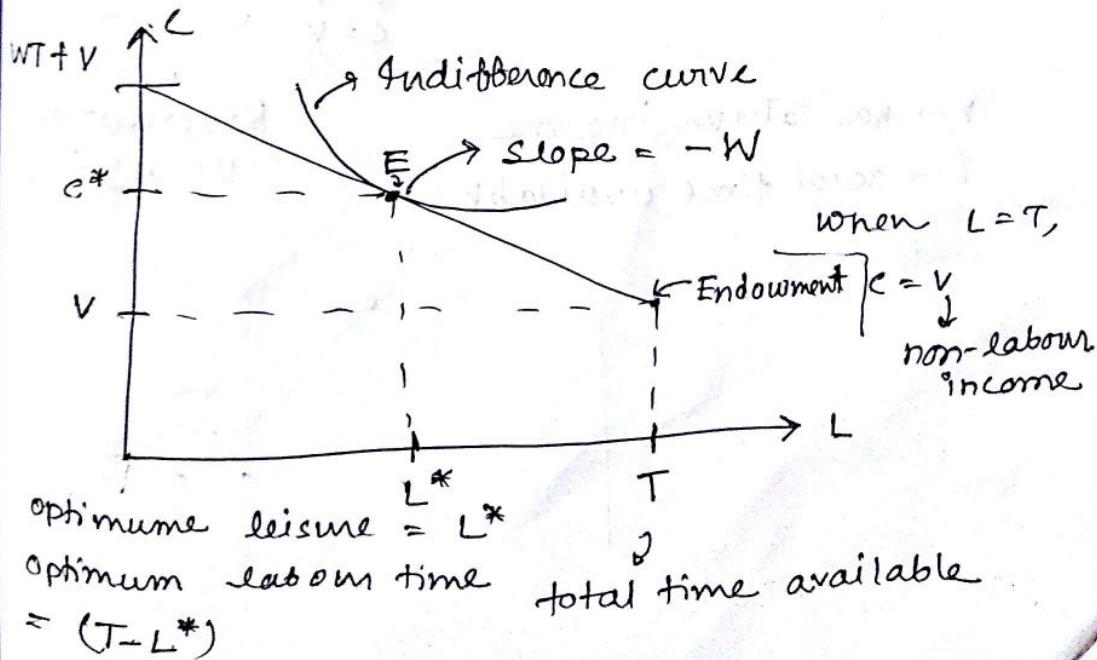
$wL + v$ → total income

Labour
income

Non-labour
income

$wL + v = c$: Budget line

$$WT - WL + v = c$$



Reservation wage

The wage at which individual is indifferent of working or not working

at

$$\uparrow \begin{matrix} E \\ J \end{matrix} \Rightarrow \frac{MU_L}{MU_C} = \text{marginal rate of substitution} = w_{L,C}$$

eqbm

$$\left. \frac{MU_L}{MU_C} \right|_{T,V} = w$$

~~w~~
a

$$U = (C - 200)(L - 80)$$

At what reservation wage, the individual is willing/unwilling to work

$$MU_L = C - 200$$

$$MU_C = L - 80$$

$$\left| MRS \right|_{L=T, C=V} = \left| \frac{C - 200}{L - 80} \right|_{\substack{L=T \\ C=V}} = \left| \frac{V - 200}{T - 80} \right|$$

$v \rightarrow$ non labour income

$T \rightarrow$ total time available

Reservation wages (w_r)

upper
join
ther
respe
Reg
is c

Gbb
= Q

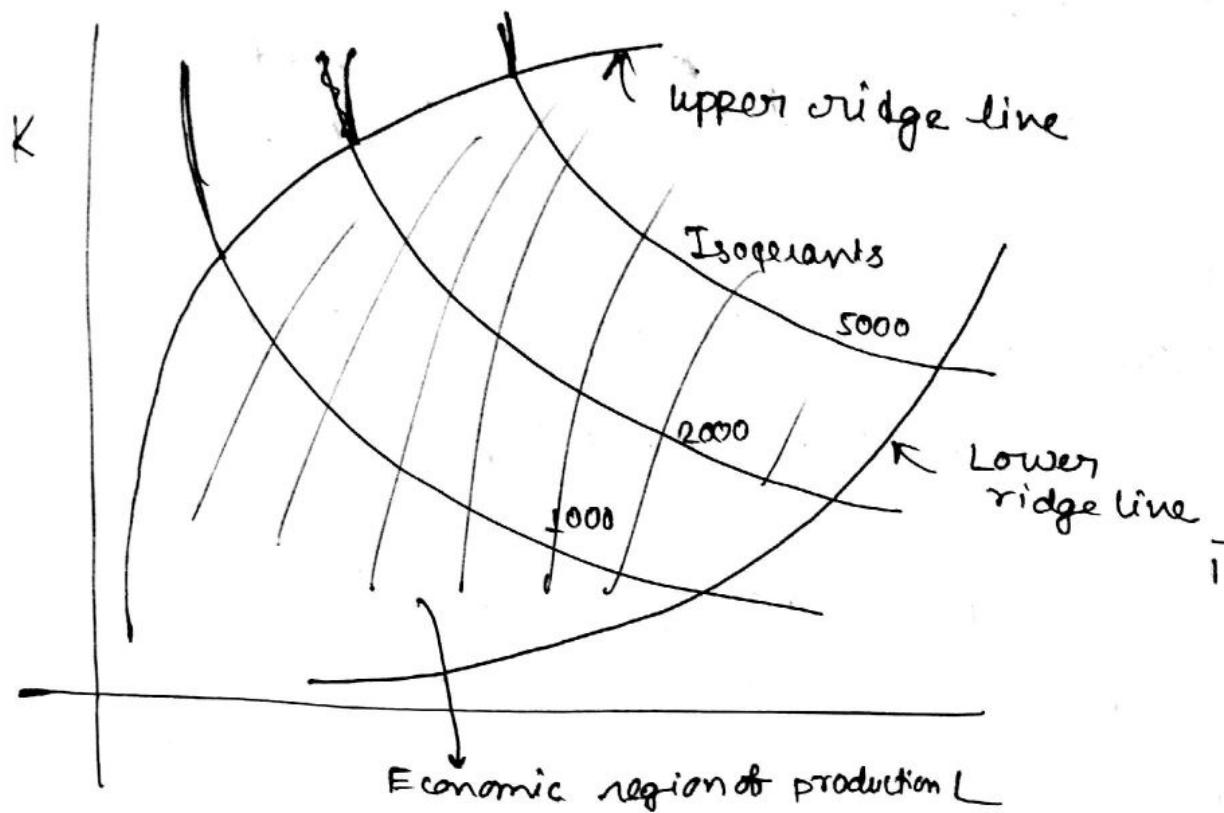
Cobb
2
ord...

21/03/17

~~Atm Nayak~~
K. Goswami

MRTS = Marginal rate of technical substitution

$$= -\frac{\Delta K}{\Delta L}$$



Upper/lower ridge lines are formed by joining the points on isoquants beyond which there is no change in labour and capital respectively.

Region bound by upper & lower ridge lines is called economic region of production

Cobb - Douglas f^n

$$Q = A K^\alpha L^\beta$$

Cobb Douglas f^n of order \pm
^{homogeneous}

$\alpha + \beta = 1$, usually
[other possibilities are also there]
 $\alpha + \beta > 1$
 $\alpha + \beta < 1$

Cobb Douglas Production f^n

$$Q = AK^\alpha L^\beta$$

$$MP_K = \frac{dQ}{dK} = \alpha A K^{\alpha-1} L^\beta$$

$$= \alpha A K^{\alpha-1} L^{\beta(1-\alpha)}$$

$$MP_K = \alpha A \left(\frac{K}{L}\right)^{\alpha-1}$$

$$MP_L = \beta A \left(\frac{L}{K}\right)^{\beta-1} = \beta A \left(\frac{L}{K}\right)^{\beta-1}$$

Cobb Douglas f^n in logarithmic form

$$\ln Q = \ln A + \alpha \ln K + \beta \ln L$$

$\alpha \rightarrow$ Capital elasticity of production = $\frac{dQ}{dK} \cdot \frac{K}{Q}$

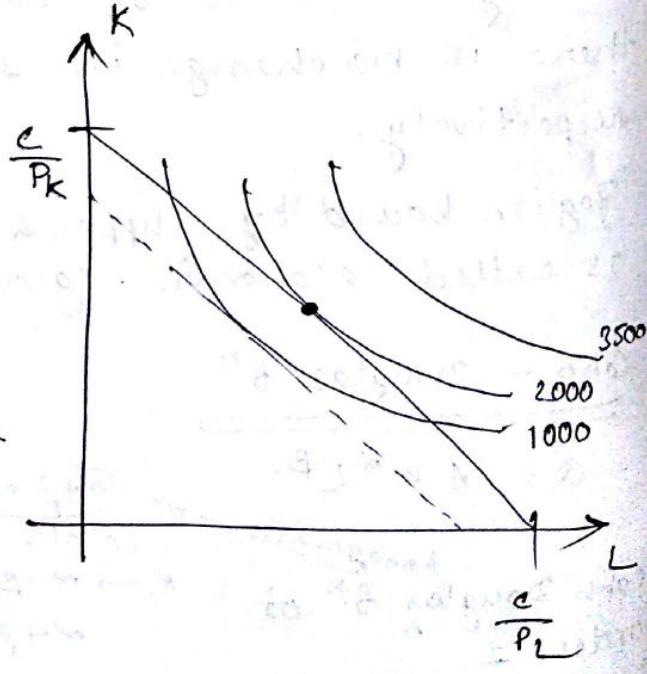
$\beta \rightarrow$ Labour " " " = $\frac{dQ}{dL} \cdot \frac{L}{Q}$

$\left(\frac{dQ}{dK} \cdot K\right) \rightarrow$ distributive output of capital

$$C = P_K \cdot K + P_L \cdot L$$

$$K = \frac{C}{P_K} - \frac{P_L}{P_K} L$$

$$L = \frac{C}{P_L} - \frac{P_K}{P_L} K$$



27/03/17

N.C. Nayak

Net cash flows

Life of the project is decided by nature of competition

life of project = 5 years

$$C = 1000 \text{ crore}$$

Machinery cost

Reorganization cost

500 cr.

500 cr.

is used to increase by 10% annually

Price / unit
Quantity

Period	R ₁	R ₂	R ₃	R ₄	R ₅
ross. Sales Revenue (P.Q) (10%)	1000 cr.	1100	1210	1331	1464.1
(-) (Variable cost) (20%)	200	220	242	266.2	292.8
(-) (fixed cost)	100	100	100	100	100
(-) (Depreciation) (Flat 20% annually)	100	100	100	100	100
Profit before tax.	600 cr.	680 cr.	768 cr.	864.8	971.3
- Tax(20%)	120 cr.	136 cr.	-	-	-

Variable cost → changes with variance in output

e.g. labour cost

On the other hand, land, machinery are fixed cost.

fixed cost → Rent, electricity bill etc.

*

Human power appreciates over time.

Profit after tax)	480 cr.	-	-	-	-
+ Depreciation	100 cr.	100	100	100	100

Depreciation is psychological expense

non-cash expense

not physical expense

compensation for companies who invest on
machines which depreciate

In final year,

Salvage + Recovery of working capital
value

Valuation of
machinery after
the period of
production

Valuation of
inventory capital

for sale or exchange
in the final year

28/03/17

Unemployment \Rightarrow voluntary unemployment B.K. Sahoo
① (according to willingness)

In India, unemployment rate is determined by employment & unemployment survey

MOSPI \rightarrow Ministry of statistics and program implementation
National Sample Survey Organization (NSSO)

Time

- Principal status | UPSS: Usual principal &
- Subsidiary status | subsidiary status
- current weekly status
- " daily status

If a person work more than 180 days in a year, then the principal status is employed, otherwise unemployed.

If an individual is employed for 80-180 days, then subsidiary status is employed, otherwise unemployed.

Current weekly status

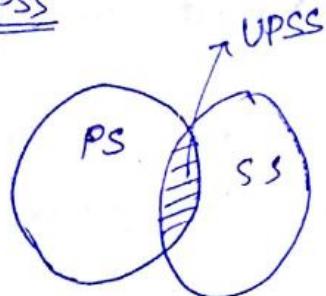
d_1	d_2	d_3	d_4	d_5	d_6	d_7	Sum
1	0.5	0	1	1	1	0	4.5

More than 9 hrs. 1-3 hrs.

If sum > 3.5 , current weekly status is employed.

Current daily status \rightarrow working for 4 or more hours in a day
 \downarrow
current daily status
is employed

UPSS



(UPSS - CDS) \Rightarrow gives magnitude of disguised unemployment
Usual Principal & subsidiary status

Poverty

Two problems of poverty:

- 1) Identification of poor
- 2) Aggregation of poor

In international comparison \rightarrow Income is considered

Bench mark: (\$1/day) income

Anyone having an income less than \$1/day is considered as poor by World Bank.

\$1/day \rightarrow Destitute / very poor

\$1.25/day \rightarrow poor

\$2/day \rightarrow vulnerable (their status of poverty may change)

In Indian context

Poverty defined in terms of
Nutritional Norm.

Benchmark

1973: Rural: 2400 kcal/day/person

Urban: 2100 kcal/day/person

↓ converted to

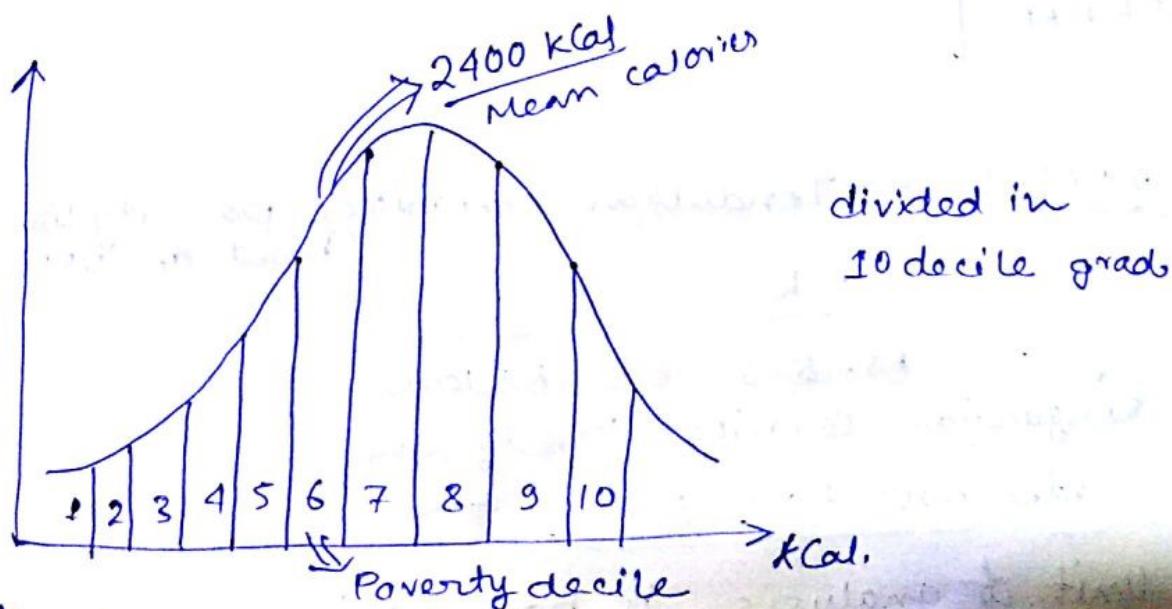
Poverty line

(Monthly per-capita expenditure)

Based on: consumer expenditure survey

ICMR → provides nutritional values of food.

↓
Indian Council for Medical Research



Mean/Average calories calculation

6th decile
(poverty decile)

400 Households

Mean food expenditure
+
Mean non food expenditure

poverty line

(in terms of monthly per capita consumption expenditure)

MPCE → Monthly per capita expenditure.

Food items expenditure → based on 30 days
non-food items → ^{based on} 365 days
(durable)

Mixed Reference period (MRP)

Reference period for food & nonfood items are different

Uniform Reference Period (URP)

<u>1973</u>	<u>Rural</u>	<u>Urban</u>
PL URP	Rs. 38	Rs 60
PL MRP		

2004-5 → Tendulkar committee poverty line
(based on URP)

2010-11 R U
J Rs. 816 Rs 1000

Rangarajan Committee Poverty line

Intra-Household poverty line

Unit of analysis is household.

1973 → Based on URP

1993-94 → URP

2004-5 → URP, MRP

2009-10 → MRP, MMRP

Modified mixed reference period

Food expenditure - 7 days

converted from

+

30 days

Non food -

365 days

Aggregation issues

i) Head - Count ratio:

$$\frac{B}{N} \leftarrow \begin{array}{l} \text{No. of} \\ \text{poor} \end{array}$$
$$N \leftarrow \text{total population}$$

2) Extent of poverty

3) Dalton principle

Degree of poverty not defined by poverty line.

Dalton's Principle

Transforming income expenditure from a non-poor to poorer it should increase measurement of poverty.

Poverty line = 1000

	MPCE	H	
1	1000	900	950
	150	150	3/4
2	650	800	750
	150	150	2/4
3		2000	
4.		900	

Poverty Gap (G_1)

$$G_1 = \frac{1}{N} \sum_{i=1}^N [(z - y_i) * I(z > y_i)]$$

z = poverty line

y_i = MPC of individual

$I(z > y_i)$ = 1, if it is true
= 0, else zero

Square Poverty Gap (G_2)

$$= \frac{1}{N} \sum_{i=1}^N [(z - y_i) * I(z > y_i)]^2$$

$\alpha = 2$
Foster's poverty

$$F = \frac{1}{N} \sum_{i=1}^N [(z - y_i) * I(z > y_i)]^\alpha, \alpha > 0$$

General form of poverty gap

$\alpha \rightarrow$ penalty coefficient

Relative poverty: Poverty in comparison with neighborhood / certain standard

irrespective of output

03/04/17

K. Choswami

Fixed cost → short term

variable cost → long term → Dependent on output

Actual cost → cost actually incurred in business

Opportunity cost → return from next best alternative that is done away with to meet current requirement in business. (Not an actual cost)

opportunity cost > ^{current} income ⇒ beneficial

business cost ↔ Full cost = Normal _{probit} + business cost.

monopolies can not fix ^{price} arbitrarily. Many other factors influence price.

Explicit cost → cost appearing in book of records.

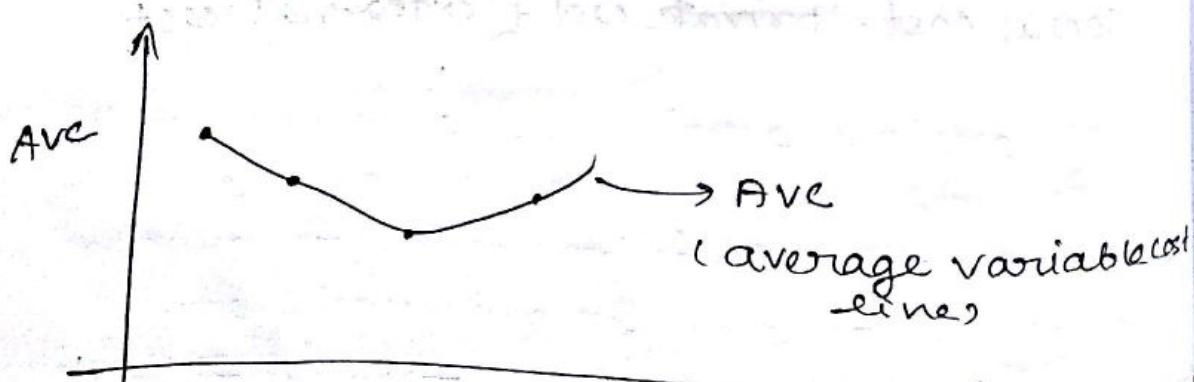
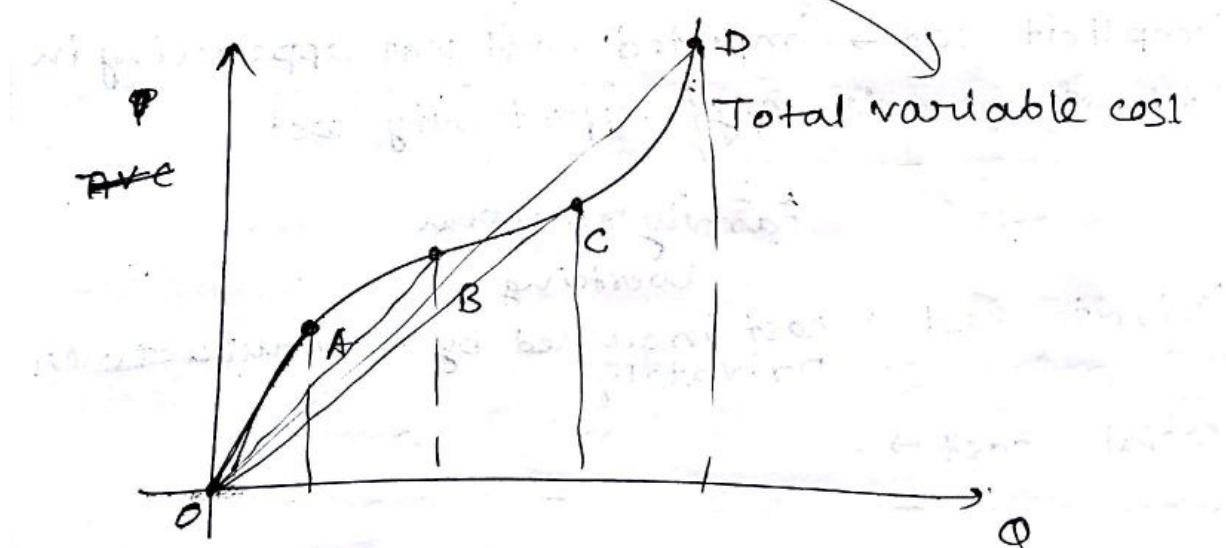
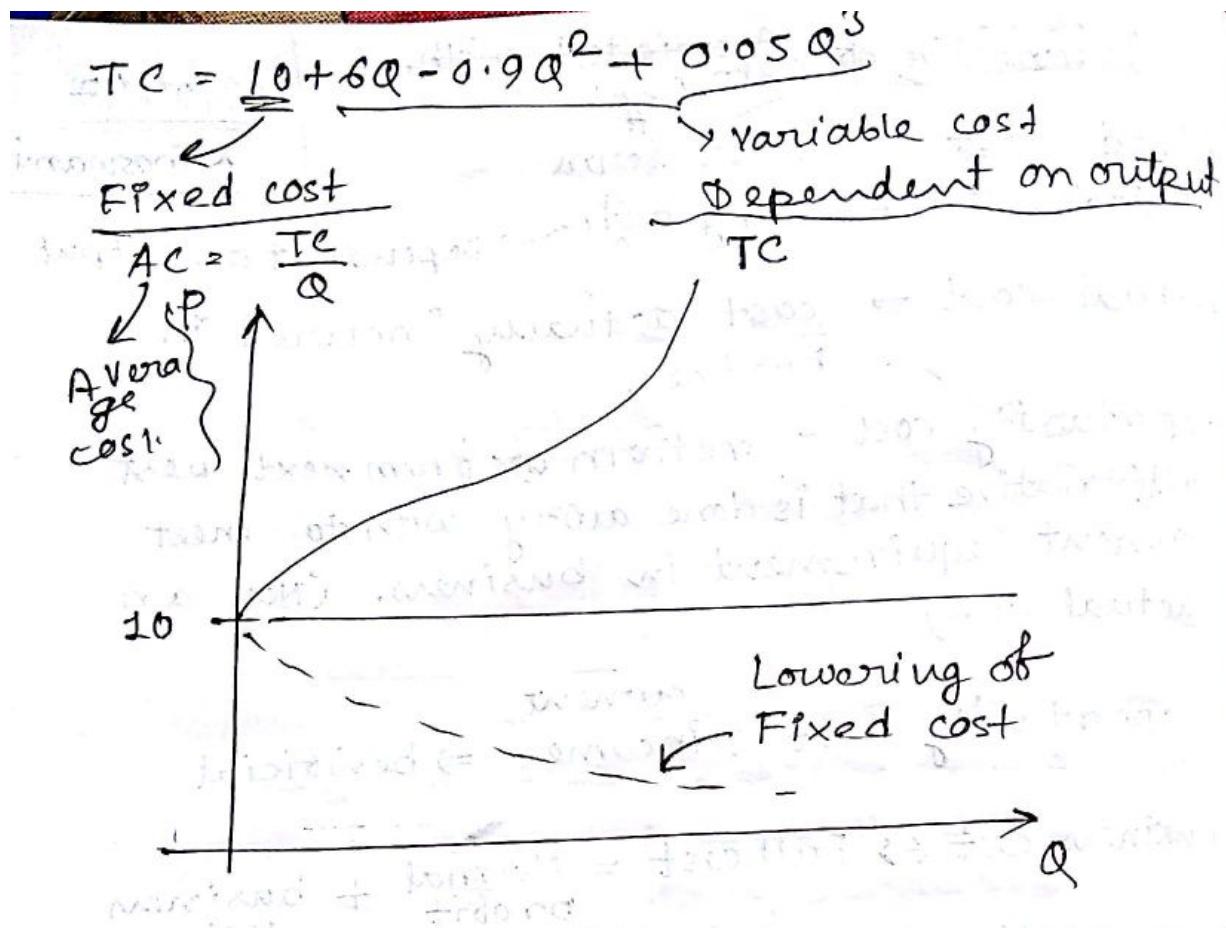
Implicit cost → imputed cost not appearing in book of records e.g.) opportunity cost

Family members
working

Private cost → cost incurred by manufacturer privately.

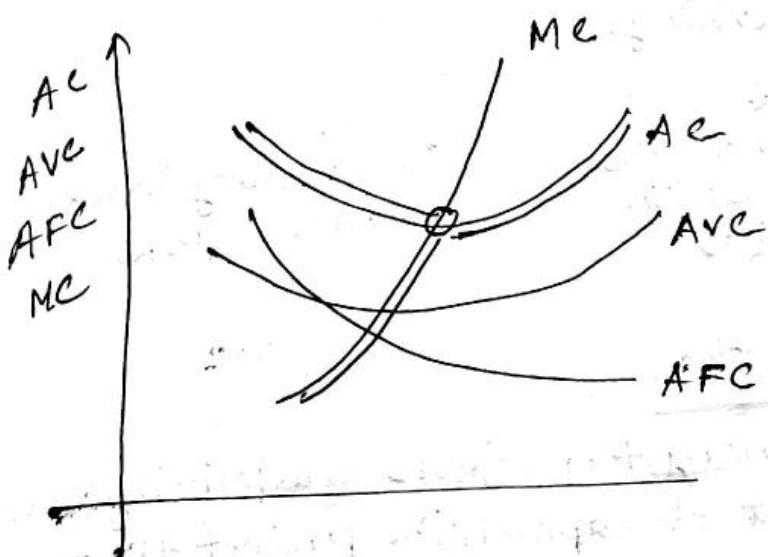
Social cost →

Social cost = private cost + external cost



$$\text{marginal cost (MC)} = \frac{dTC}{dQ} = 6 - 1.8Q + 0.15Q^2$$

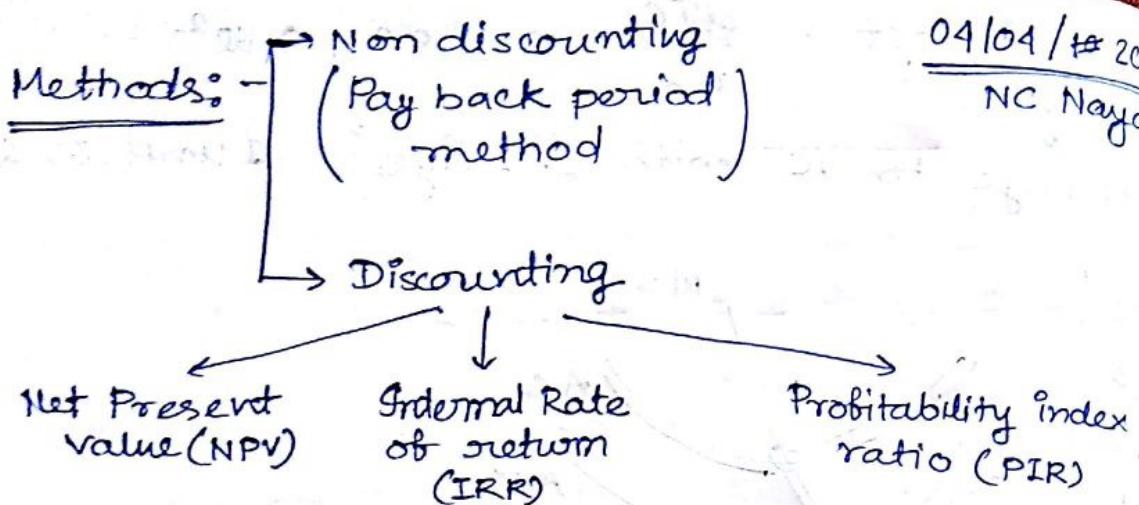
↓
change in TC with change in 1 unit of Q



$$MC = \frac{d(TC)}{dQ} = \frac{d(AC \cdot Q)}{dQ} = AC + Q \frac{d(AC)}{dQ}$$

$$\frac{d(AC)}{dQ} = \frac{1}{Q} (MC - AC)$$

Average cost in reality can not be minimized to produce at lowest point of AVC curve. Modern concept incur a concept of reserved capacity.



Pay back period method

- Suggests that, amongst projects requiring same amount of capital, the project that pays back the capital investment in the shortest period should be embarked.
- Period of recovery of capital should be less

A	50	50	50	50	50
B	30	60	90	120	170

→ Only period of recovery is considered irrespective of life of the project. Period of manufacture is considerably longer. So, is the current scenario, entrepreneurial ventures are more in number in IT and banking sector. This is shortcoming of the method. e.g. project B gives more profit in long run although period of recovery for project A is shorter

→ Other shortcoming is, future values can not be equated to initial investment because of variation of value of money in time depending on rate of inflation, rate of interest and risk.

Nominal value of money is const. But realised money value changes. With inflation real value of money is deflated.

- Deflation of value of money is not taken care of in this method. i.e. non-discounting
- Risk involves, as, money is promised in future.
- Risk involves, as, money is promised in future. Political situation matters a lot in this scenario. e.g. risk of doing business in China is less compared to India. Greater the corruption greater is the risk.

Discounting Method

- # → Takes in account Inflation, interest, risk

e.g. Inflation $\rightarrow 5\%$.

Interest $\rightarrow 10\%$. ← Nominal interest

Risk $\rightarrow 2\%$

$$\text{Realized interest} = [10 - (5+2)] = 3\%$$

- Future values are deflated from nominal to realized value.

$$FV_1 = PV(1+r)^t \quad \begin{matrix} \nearrow \text{compound rate} \\ \searrow \text{Realized rate of interest} \end{matrix}$$

$$PV = \frac{FV_1}{(1+r)^t} \quad \begin{matrix} \text{(Inflation adjusted, risk} \\ \text{adjusted)} \end{matrix}$$

$\searrow \text{discount rate}$

$$PV = \frac{FV_2}{(1+r)^2}$$

- In this case also, lifespan of project is not considered. A longer lifespan may lead to greater value of total profit.

Discounting Method:

$$NPV = \sum_{t=1}^n \frac{R_t}{(1+r)^t} - \sum_{t=1}^n \frac{C_t}{(1+r)^t}$$

Present value of NCF - Present value of
 Net cash flow
 2017 (reference year)
 $C = 100$

$$NPV = \left(\frac{100}{1+r} + \frac{80}{(1+r)^2} + \frac{70}{(1+r)^3} + \frac{50}{(1+r)^4} \right) - \left(20 + \frac{30}{(1+r)} + \frac{50}{(1+r)^2} \right)$$

Decision Rule

$NPV > 0 \leftrightarrow \text{Accept}$

$NPV < 0 \leftrightarrow \text{Reject}$

$NPV = 0 \leftrightarrow \text{Neutral}$

$\rightarrow r_E = ((1+r) - 1)$ acceptable

IRR \Rightarrow Same as marginal efficiency of capital

$$\sum_{t=1}^n \frac{R_t}{(1+i)^t} - \sum_{t=1}^n \frac{C_t}{(1+i)^t} = 0 \quad i = IRR$$

$i > r \rightarrow \text{Acceptable}$

\rightarrow Annual cost of raising capital

$i < r \rightarrow \text{reject}$

$i = r \rightarrow \text{Neutral}$

\rightarrow Both methods give same conclusion
 Subjected to same project

	NPV	IRR
A	100	12%
B	150	10%

→ Comparing two mutually exclusive projects.

NPV is better than IRR method owing to the reasons

- For longer duration, finding value of i is difficult
- R varies over time. Thus calculating IRR for one instance of time alone, is misleading. Average of such instances should be considered.

→ The return from the reinvestible amount is as much as the return from the investible amount

C	R_1	R_2	R_3
100	100	120	150

- In NPV method
 - return from investible amount i.e. bank interest. That is justified but in IRR,
 - discount rate is considered. Thus overestimate the returns.

MPV has also limitations

→ Initial capital requirement may be more for higher MPV.

→ A ~~pp~~ project is such chosen that rate of profit is maximum

PIR → Benefit cost ratio (BCR)

→ Net Benefit cost ratio (NBCR)

$$BCR = \frac{PV \text{ of } R_t}{PV \text{ of } C_t}$$

$$NBCR = \frac{NPV}{C_0} = \frac{PV \text{ of } R_t - PV \text{ of } C_t}{PV \text{ of } C_t}$$

$NBCR > 0 \Rightarrow BCR > 1 \Rightarrow \text{Accept}$

$NBCR < 0 \Rightarrow BCR < 1 \rightarrow \text{Reject}$

$NBCR = 0 \Rightarrow BCR = 1 \rightarrow \text{Neutral}$

→ In this method amount of initial capital requirement is considered and the features of MPV also.

→ Thus MPV method is improvised in the form of PIR.

→ For more than one project selection, weighted average of NBCR should be considered.

04/04/17

B.K. Sahoo

PL URP → uniform reference period

PL MRP

PL MMRP

$$C_i = \frac{1}{N_i} \sum_{j=1}^{303} q_{ji} x_j$$

C_i = per-capita calorie consumption of i^{th} household

N_i = Household size of i^{th} HH

q_{ji} = quantity of j^{th} food ~~item~~ item for i^{th} household.

x_j = per unit calorie of j^{th} food item

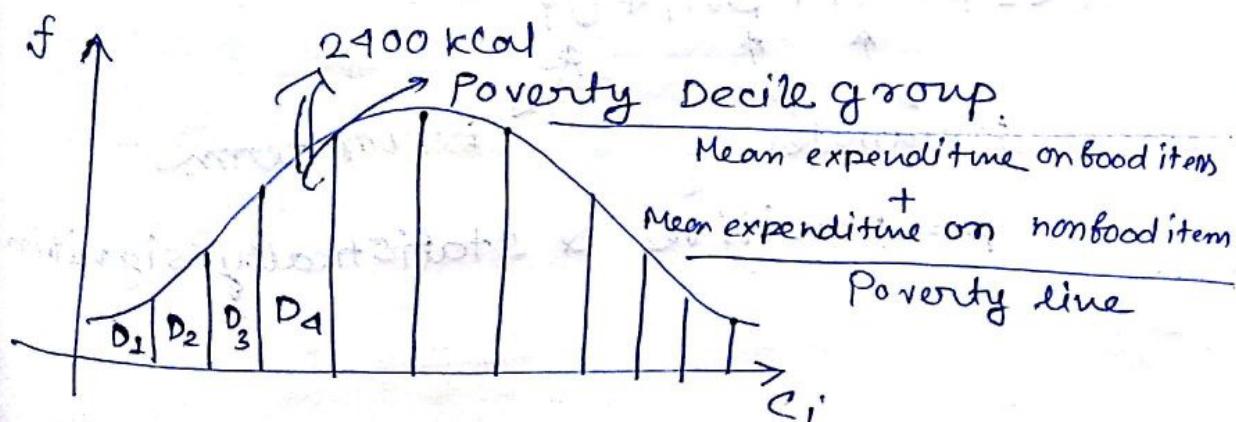
1978 - Task force

	Food items	Non food items
URP	30 days	30 days
MRP	30 days	365 days
MMRP	7 days	30 days

1992 - Khandelwala → URP

2004 - Tendulkar committee → MRP

2014 - Rangarajan n → MMRP



- Globalization
- Economic integration
 - Socio-cultural "
 - Political integration

Economic integration

→ Measured by trade intensity

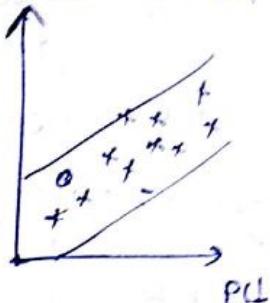
$$\left(\frac{X + M}{GDP} \right)$$

Export + Import

globalization
per capita
income

PCI

Globalisation



Globalization increases standard of living
measured by per capita income.

$$PCI_i = \alpha + \beta G_i + U_i$$

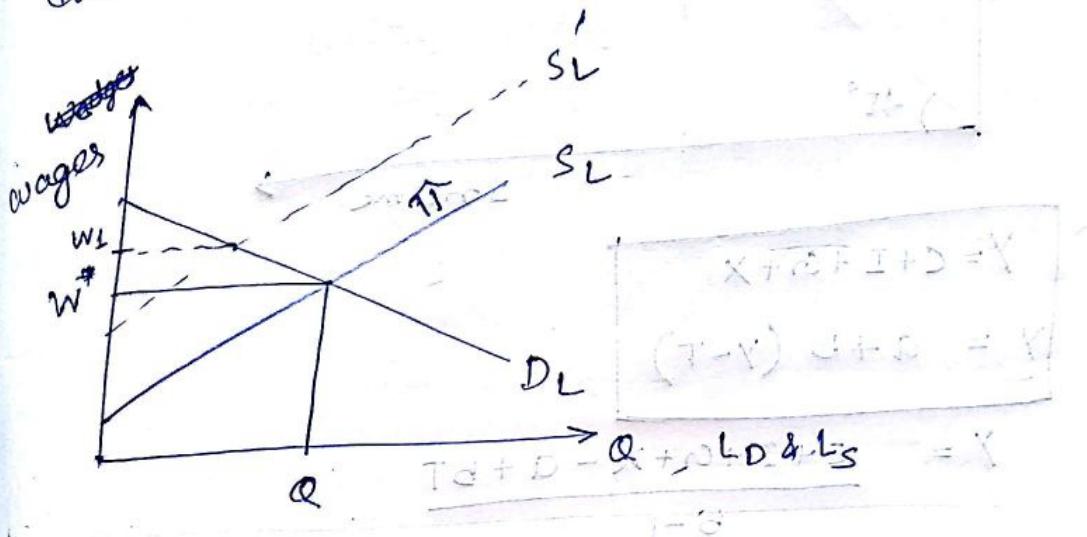
Parameter

Error term

β = positive & statistically significant

- How globalisation improves standard of living?
- Mobility of Labour
 - Mobility of capital
 - Increase in production

Mobility of labour → Movement of labour in cross country environment. Depends majorly due to political integration.



w^* → without mobility

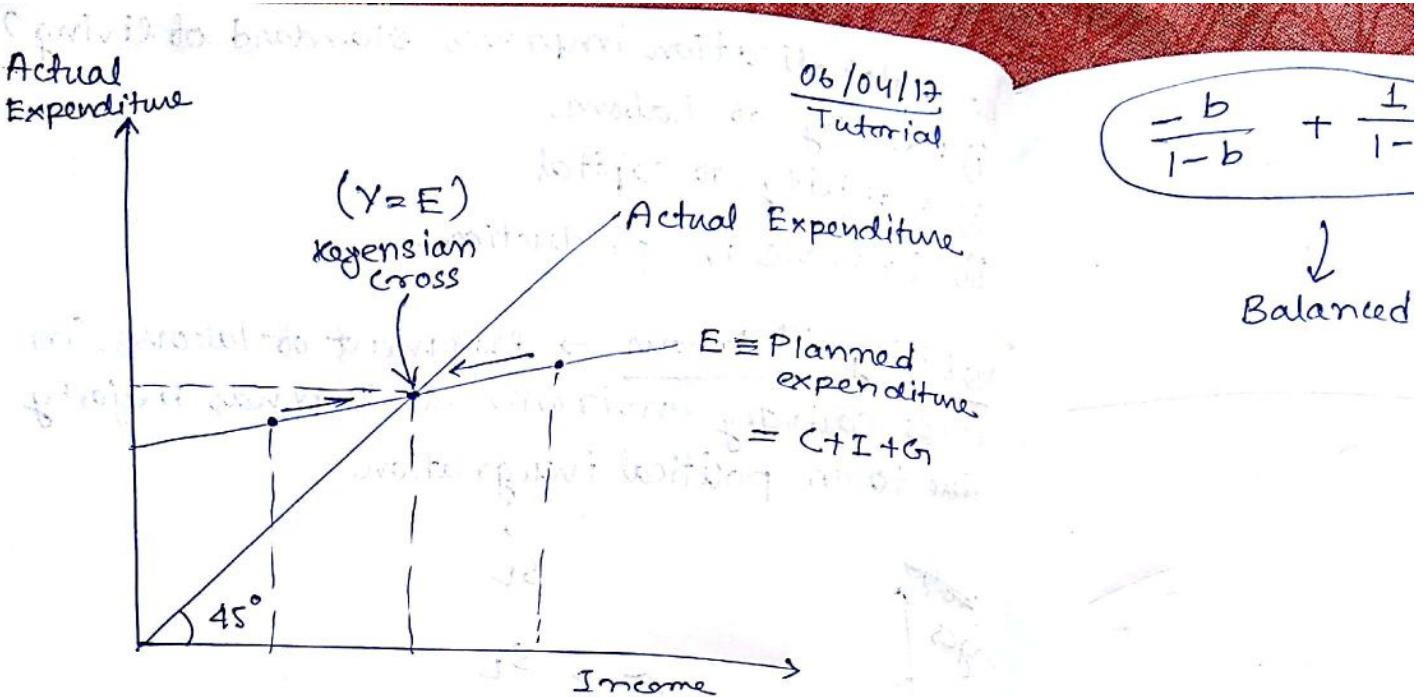
w^* → with mobility

Due to shortage in labour market due to immigration, labour in the country receives higher wages.

Mobility of capital:

$$R = \frac{R_1}{R_2} = \frac{1}{1 + \frac{1 - \tau}{\tau}}$$

Capital cost



$$Y = C + I + G + X$$

$$Y = a + b(Y - T)$$

$$Y = \frac{C + I + G + X - a + bT}{b - 1}$$

$$Y = \frac{a}{1-b} - \left[\frac{C + I + G + X + bT}{1-b} \right]$$

$$Y = \frac{a}{1-b} - \left(\frac{b}{1-b}T + \frac{1}{1-b}I + \frac{1}{1-b}G + \frac{1}{1-b}X \right)$$

$$b = \begin{cases} 1) 0.4 \\ 2) 0.6 \\ 3) 0.8 \end{cases}$$

Multiplicators
(consider the signs also)

1) Govt. spending multiplier = $\frac{1}{1 - 0.4} = \frac{1}{0.6} = \frac{5}{3} = 1.67$

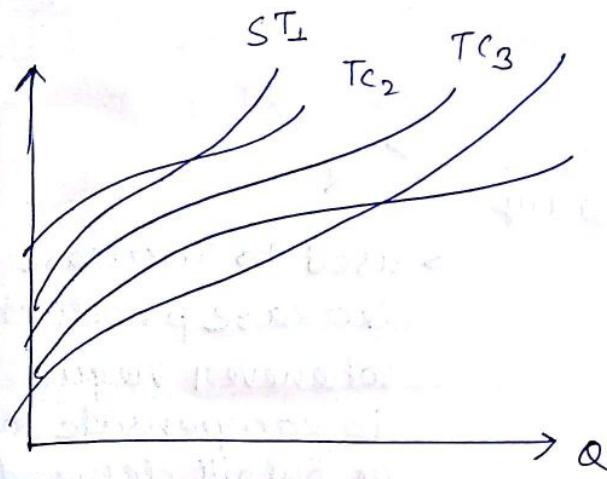
2) Tax multiplier = $\frac{0.6}{0.4} = \frac{3}{2} = 1.5$

$$\left(\frac{b}{1-b} + \frac{1}{1-b} \right) = 1$$

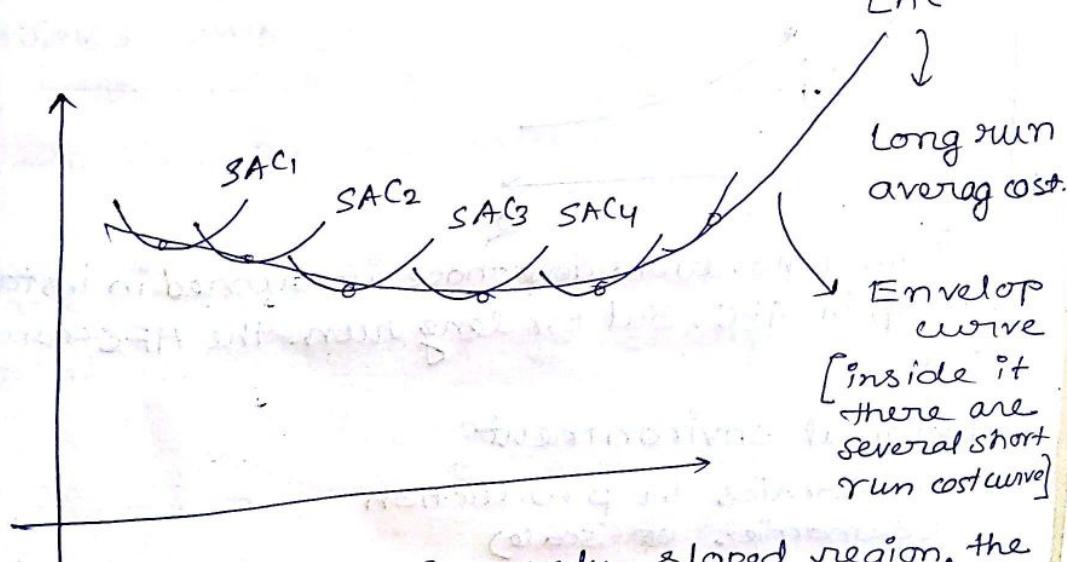
↓
Balanced budget multiplier

$$\left(\frac{-b}{1-b} + \frac{1}{1-b} \right) = 1$$

↓
Balanced budget multiplier



10/04/17
K. Grewal



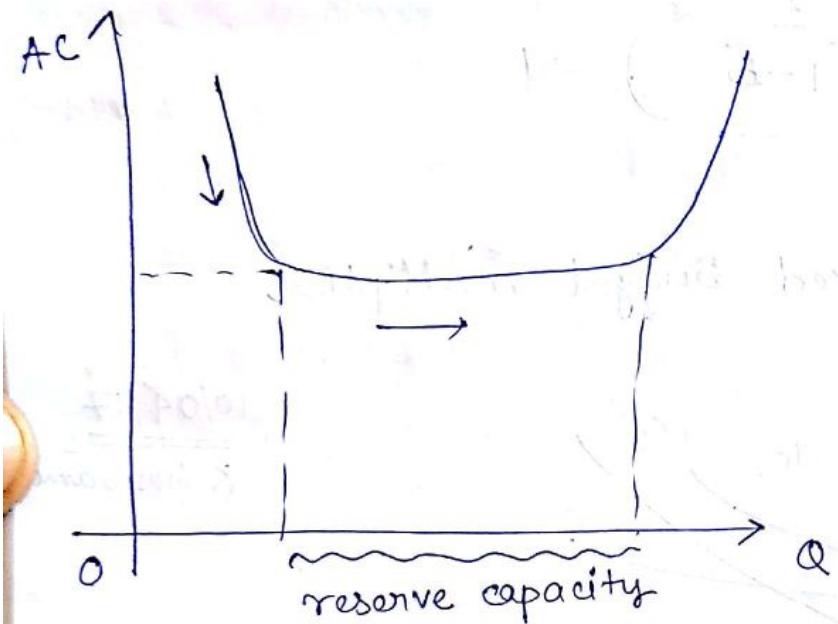
Usually, somewhere in very sloped region, the production takes place.

Long run average cost
Envelope curve
[inside it there are several short run cost curve]

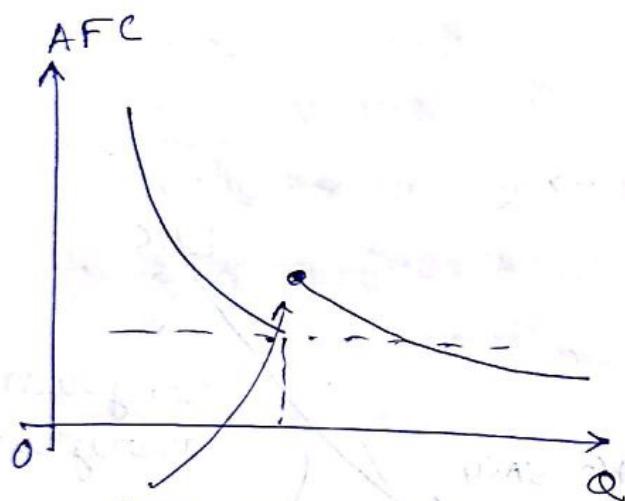
0.4
0.6
0.8

$\frac{1}{0.6}$

7



→ used to increase or decrease production whenever required to compensate losses or fulfill demand.



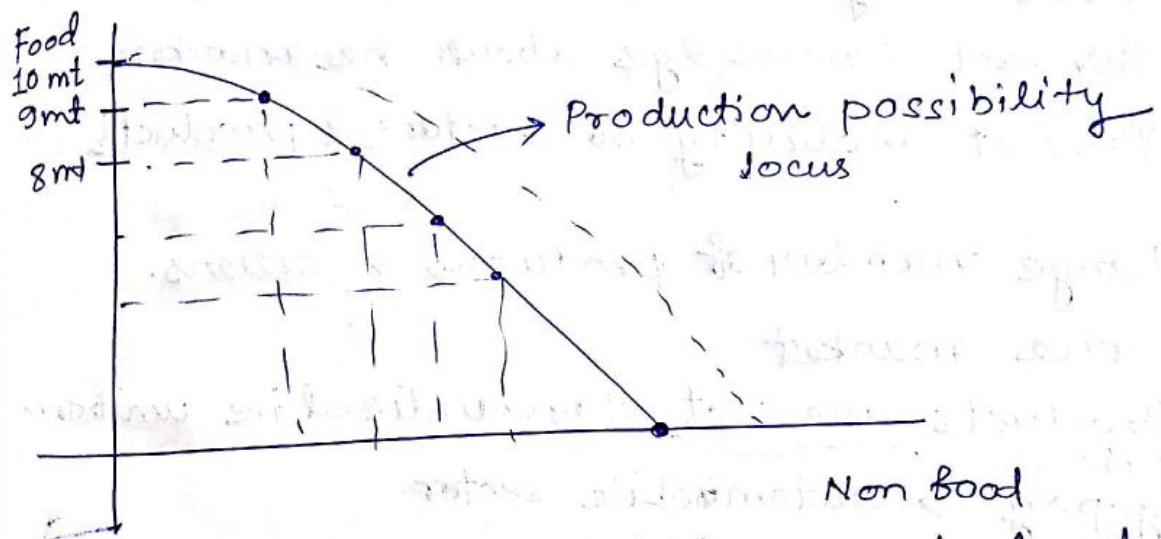
Some renovations done, those incurred in instant shoot up in AFC. But for long run, the AFC comes down.

→ External environment

- * Economics in production (economies of scale)
- * Economics in buying and selling (internal economy)

During off season, raw materials are priced high. So, getting changing the buying frequency may lead to change in lowering of average cost.

- * Economies in transportation & storage
 - Managerial economies
 - * Labor diseconomies
- production Possibility locus / 1 input 2 output model



Follows law of diminishing marginal return
The curve is concave.

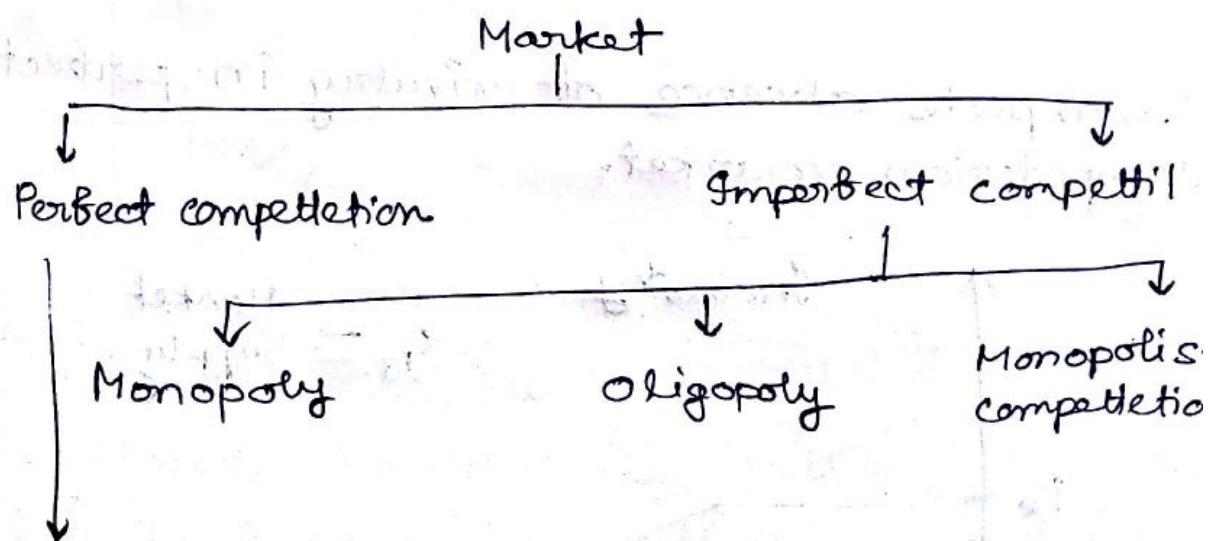
Production Box diagram

11/04/17

N C Nayak

Market : Invisible institute that

deals with demand and supply.



Information is shared in between producers uniformly.

Perfect Competition

Attributes

1. Large no. of buyers & sellers
2. Product homogeneity
3. Free entry & exit
4. Perfect knowledge about the market
5. Perfect mobility of factors & products

→ Large number of producers & sellers.

e.g. rice market

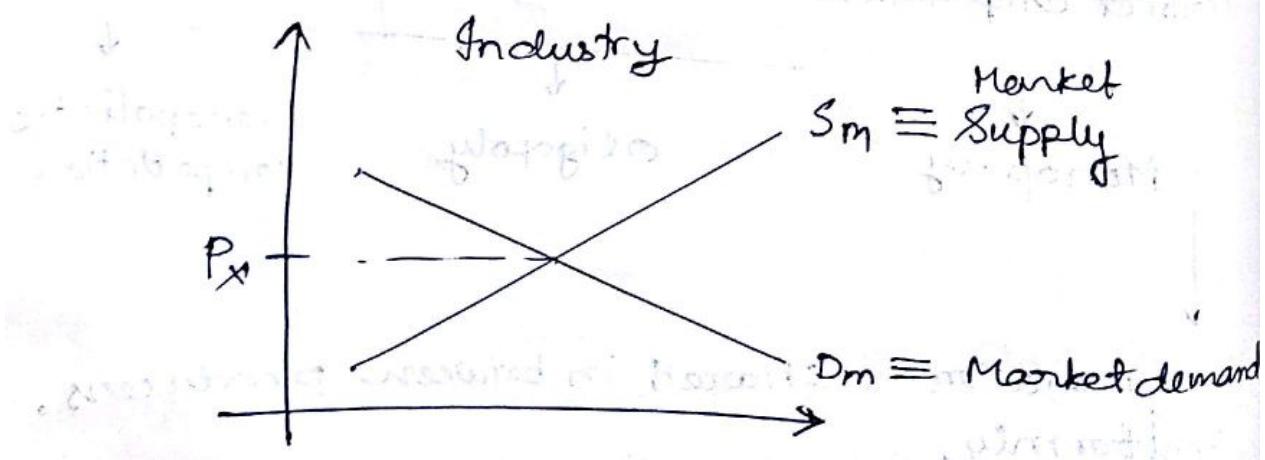
→ Products are not standardized i.e. uniform price,
oligopoly → automobile sector

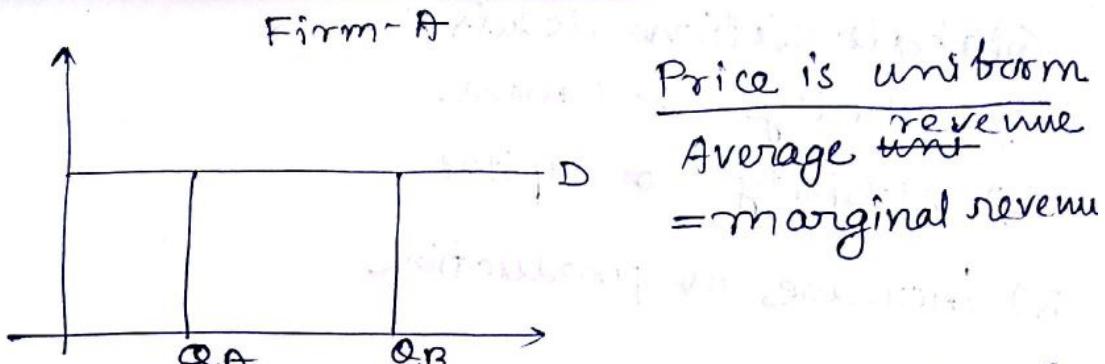
There are perfect substitutes of each product
in perfect competition.

→ Price is uniform

Monopolistic competition → Differentiated but
close substitutes. e.g. Colgate & close up

→ Complete absence of rivalry in perfect
competition market.





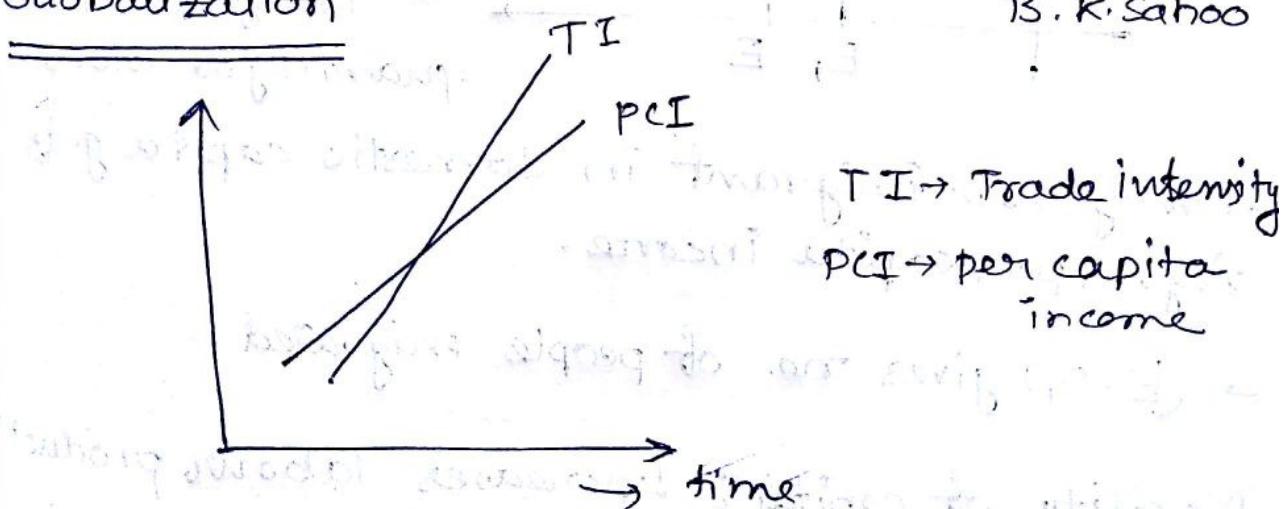
Each individual producer is price taker. So, they can only adjust output quantity to maximize the ~~output~~ profit. Individual firm can not decide the price. Individual buyer can not ~~fix~~ influence price. Price can be influenced only by industry.

Limit price policy \rightarrow utilised by ^{mono} oligopoly markets.

Globalization

11/04/17

B. K. Sahoo



TI & PCI are highly correlated, i.e. they are closely related. Globalization leads to higher per capita income i.e. better standard of living.

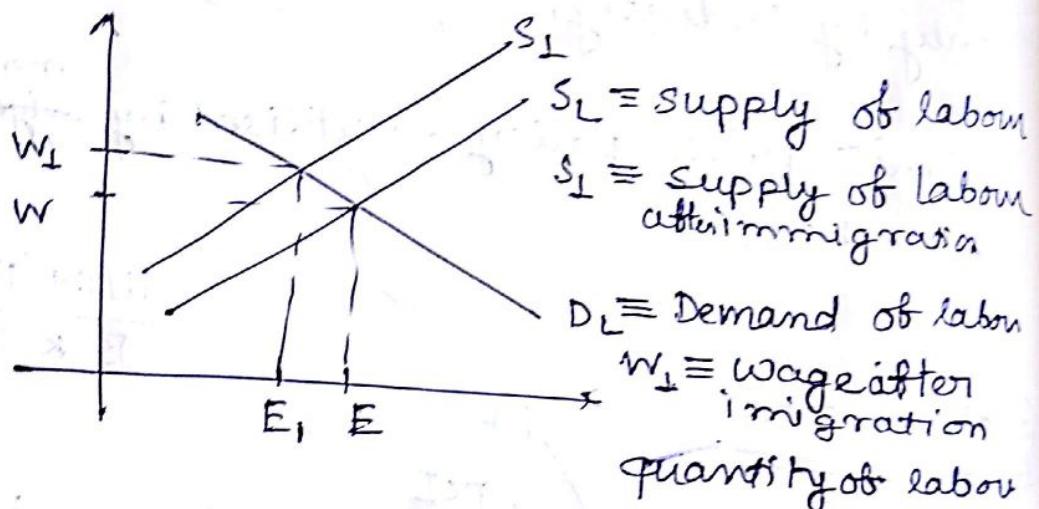
Globalization leads to

- 1) Mobility of Labour
- 2) Mobility of capital.
- 3) Increase in production

Mobility of Labour (Immigration)

Direct Impact: Immigrants get higher wage, i.e. they have better standard of living.

Indirect Impact: Non-immigrant



→ Every non-immigrant in domestic capita gets higher per capita income.

→ $(E - E_1)$ gives no. of people migrated

Mobility of capital: Increases labour productivity \Rightarrow increase in wages \Rightarrow increase in per capita income.

→ Make in India

Huge Labor force but low capital. Thus foreign investment helps to increase the productivity of Labor

Closed economy

10/11/17 + Rev

Year	Produced	Consumed
2016	1000	800
2017	600 + 200	800

Open economy (globalised)

	Produced	Consumed	X _I	X
2016	1000	800	200	500
2017	1500	800	700	

⇒ Thus globalization induces increase in production.

HDI

Balance of payment

Unemployment

Poverty

Globalisation

Topics in part covered by
B.K. Sahoo