

NDP: Net Domestic Product = GDP - Depreciation

NNP: Net National Product = GNP - Depreciation.

Depreciation \rightarrow how much we consume the fixed capital to produce goods.

Methods of Calculating GDP:

- ① Expenditure Approach.
- ② Income approach.
- ③ Value Added Approach.

④ Expenditure Approach to calculate GDP - (GDP at market price)
 private consumption $= C$. (GDP_M)

private investment expenditure $= I_p$.

government/public consumption Exp. $= G$ (recurring Exp.).

government/public investment Exp. $= I_h$

$I_p + I_h = I$ \leftarrow Total investment \Rightarrow Investment Exp.

$I_p \uparrow$ & $I_h \downarrow \leftarrow$ leads to privatization (crowding out effect).

$$GDP = Y = C + I + G - M + X = [C + G + I] + \underbrace{(X - M)}_{\substack{\text{Current Account Balance}}} \rightarrow$$

$M_I \rightarrow$ Imported Investment Exp.

$X \rightarrow$ Net Exports.

$M_C \rightarrow$ Imported Consumption goods.

$M_H \rightarrow$ Imported Govt.

$$M = M_I + M_C + M_H$$

$X \rightarrow$ Exports.

② Income Approach to calculate GDP: (NDP_f) (National Net Domestic Product at factor cost)

Income \rightarrow rewards to the factors of production.

Factors of production \rightarrow ① Labour \rightarrow Wages (reward)
 ② Land \rightarrow Rent (reward)

GDP → measure of standard of living / economic progress.

CLASSMATE

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③ Capital → Interest (reward)

④ Entrepreneurship → Profit (reward)

NDP_f = Wages + Interest + Rents + Profits.

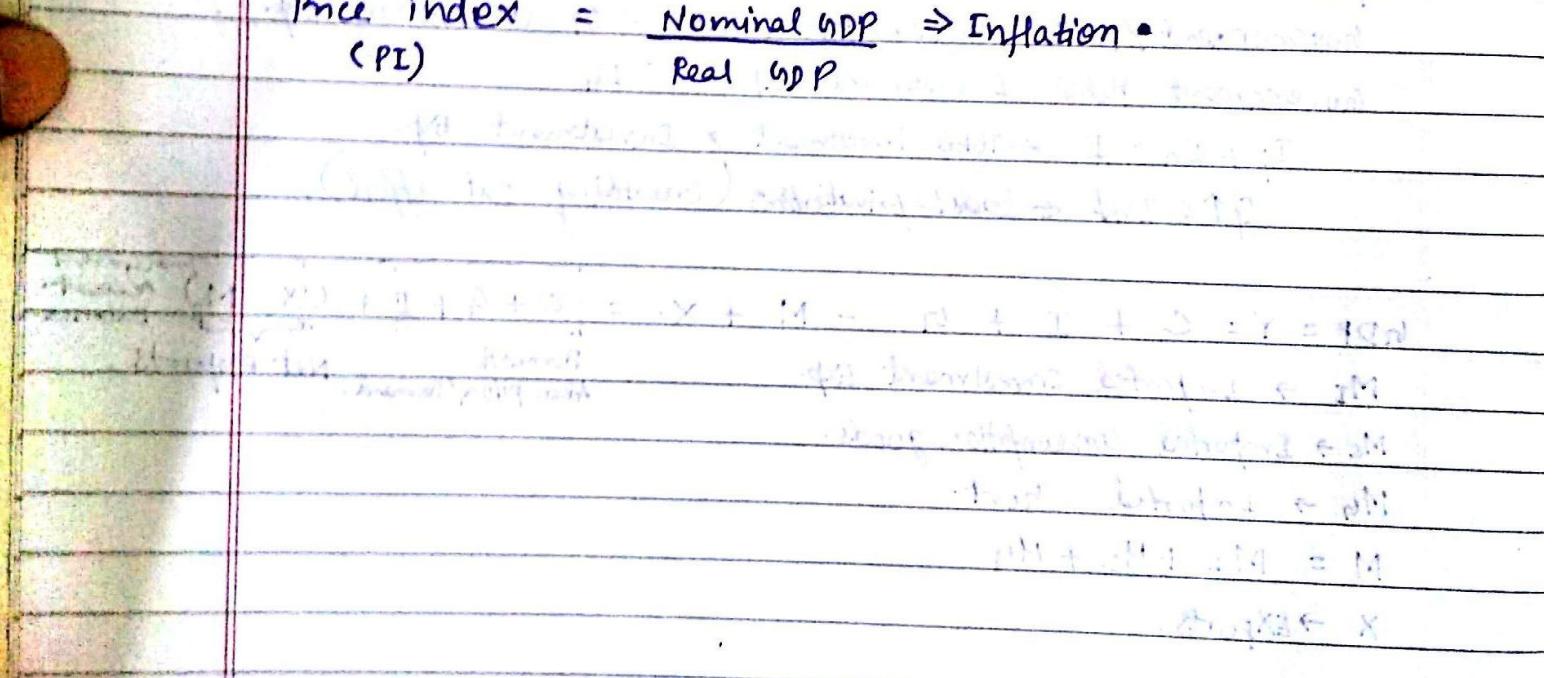
③ Value Added Approach to calculate GDP.

Value is added at each stage of production to its previous value in a product.

Sum up all the value added in the stage of production.

- Nominal GDP → price not constant. ← does not represent true economic value
- Real GDP → price remains constant.
↳ fix a base year price.

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



Inflation = Actual Price - Nominal Price
Actual Price = Nominal Price + Inflation

WEEK-4.
MONDAY

8.8.2016 Price index (PI) = Nominal GDP

↓
Real GDP.

gives information about inflation.

$$GDP_{real} = \frac{\text{Nominal GDP}}{PI}$$

PI = $\frac{P_t \cdot (\text{current})}{P_b \cdot (\text{base})}$ ⇒ P_t = concurrent price indices.

P_{t-1} (chain price index).

$P_t = \text{general price level in time } 't' = \sum_{i=1}^n w_i p_i t$

Different types of PI's:-

$w_i \rightarrow \text{weight}$

$$= \frac{q_{ib} p_{ib}}{\sum_{i=1}^n q_{ib} p_{ib}}$$

① Loafee's PI $PI(L) \Rightarrow$ overestimate the substitution effect.

② Paacher's PI $PI(P) \Rightarrow$ underestimate the substitution effect.

③ Fisher's PI $PI(F)$

= share of i^{th}

commodity value.

in the total value in base year.

$$(1) PI(L) = \frac{\sum_{i=1}^n q_{ib} p_{it}}{\sum_{i=1}^n q_{ib} p_{ib}}$$

q_{it} = quantity of i^{th} commodity in time t .

$$(2) PI(P) = \frac{\sum_{i=1}^n q_{it} p_{it}}{\sum_{i=1}^n q_{it} p_{ib}}$$

q_{it} = quantity of i^{th} commodity in time t / current time.

$$(3) PI(F) = \sqrt{PI(L) * PI(P)} \quad (\text{Fisher's ideal index})$$

| Year | X_1 | | X_2 | | | X_1 | | X_2 | |
|-------------|-------|---|-------|----|-----------------------|--------------|-----------------|-------|--|
| | P | Q | Expt. | Q | P = $\frac{Expt.}{Q}$ | $P_t q_{ib}$ | $P_{ib} q_{it}$ | | |
| 2010 (base) | 10 | 2 | 600 | 30 | 20. | 30 | 20. | | |
| 2015 (t) | 15 | 4 | 100 | 25 | 4. | 150 | 100 | | |

Purchasing Power parity (\$)
 PPP (\$) (Fixed basket of commodity).
 Per capita GDP = $\frac{\text{GDP}_{\text{PPP}}}{\text{Population}}$

to compare GDPs across countries.

Structural transformation.

composition of GDP changes in the process of development sectors.

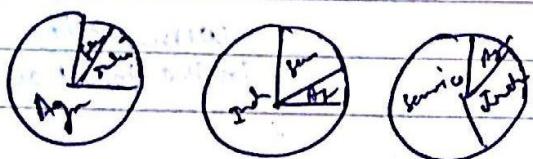
- Agricultural.
- Industry.
- Services

phases of economic development.

Phase I → Agriculture dominates in terms of GDP and Employment

Phase II → Industry

Phase III → Service sector



Employment follows the same trend.

Phase of development (stages).

Indian economy.



Employment does not follow the same trend as the economy.

Industry remains same.
 service increased drastically.

Agriculture declines slowly.

WEEK-5

TUESDAY

16.8.2016

There is a difference between Development and Economic growth. (it's just a means not the only thing).

Human Development Index (HDI)

HD : increase (\uparrow) in people's choice.

3 indicators to measure human development. [Dimensions/Choices]

① Income \rightarrow per-capita income (indicator)

② Education \rightarrow Gross enrollment ratio / Adult literacy Rate. (indicator)

③ Health \rightarrow Life Expectancy at Birth (indicator).

1990 \rightarrow UNDP \rightarrow produced human development reports.

Team leader - Mahboub Ul Haq (father of HDI).

* Human Development as a concept was developed from the concept of capabilities and functionings.

① Income \rightarrow per capita income. (\$ \leftarrow units) (Years)

② Education \rightarrow Average years \leftarrow of schooling / Expected years of schooling.

③ Health \rightarrow life expectancy at birth. (Years \leftarrow units)

Income index. = $\frac{\ln(\text{Actual value}) - \ln(\text{min. value})}{\ln(\text{max. value}) - \ln(\text{min. value})}$ \ln : natural logarithm

Education index: $E_1 = \frac{\text{Actual value} - \text{Min. value}}{\text{Max. value} - \text{Min. value}}$ $E = \frac{E_1 + E_2}{2}$

$(E_2) = \frac{\text{Actual} - \text{Min. value}}{\text{Max. value} - \text{Min. value}}$

Health index. $H = \frac{\text{Actual} - \text{Min. value}}{\text{Max. value} - \text{Min. value}}$

I, E_1, E_2, H

I, E, H

[Now], $HDI = (I * E * H)^{1/3}$ of G.M. of I, E, H .

In 1990, $HDI = \frac{H + I + E}{3}$ A.M. of I, E, H .

Logarithms of income change →
Diminishing Returns of Transforming income to Human Development

- * Education and Health indicators does not need logarithm as it has constant impact on all kinds of people. But income has different impacts on different people such as (rich and poor).

Goal Post. (Max./Min.)

Fact

In India,

1st in [2001] (Human Development Report)

→ produced by Planning commission.

2nd in [2011] (Human Development report)

→ IASR / Planning commission (produced)

IMR :→ Infant Mortality Rate.

U5MR :→ Under 5 mortality rate.

→ we are taking this in calculating HDI (Health index) instead of Life Expectancy Rate.

→ negative effect so take reciprocal values.

→ There is a different test for literacy in different countries.

Gross enrollment Ratio (GER)

Net enrollment Ratio (NER).

$\boxed{\text{GER}} = \frac{\text{No. of students in primary school}}{\text{population of students in age } 6-11}$

$\boxed{\text{NER}} = \frac{\text{No. of students in primary school, in age } 6-11}{\text{No. of individual in the age group of } 6-11}$

$$\boxed{A.M. \geq G.M.}$$

Next Class: Capabilities and functioning concept for HDI.

Example

Goal Post



| | Max. | Min. |
|-----------------------------|----------|-------|
| Life Expectancy | 85 | 25 |
| Avg. years of schooling | 15 | 0 |
| Expended years of schooling | 18 | 0 |
| Per-Capita income | \$75,000 | \$100 |

in India

| | |
|--------------------------|-------------|
| Life Expectancy at Birth | 79.93 years |
| Avg. years of schooling | 8.37 years |
| Expected | 13.5 years |
| Per capita income | \$13011.7 |

Calculate the HDI using the given information.

formula $\rightarrow \boxed{HDI} = (I \cdot E \cdot H)^{1/3}$.

There are 2 countries $\boxed{C_1}$ & $\boxed{C_2}$.

| | C_1 | C_2 | |
|------|-------|-------|-------|
| 2014 | 0.823 | 0.550 | ← HDI |
| 2015 | 0.900 | 0.700 | ← HDI |

* which country $\boxed{C_1}$ or $\boxed{C_2}$ has done better in terms of improving standard of living.

Improvement Index = $\frac{X_2 - X_1}{M - X_1}$ { $M \rightarrow$ Max. threshold}.
 $I(X_1, X_2, M)$. \leftarrow Sen's index.

it is used in case of (pre)social indicators, not in negative social indicators like infant mortality rate (IMR).

There are 2 indicators for improvement index.

• ~~Kakwani index~~ Sen's index

• Kakwani Kakwani

↳ $I(X_1, X_2, M, M_0)$

$$= \frac{(M - M_0)^{1-\varepsilon} - (M - X_1)^{1-\varepsilon}}{(M - M_0)^{1-\varepsilon}}, \text{ where } 0 < \varepsilon < 1.$$

X can be varied; $X = X_L$ for 1st year, $X = X_2$ for 2nd year .. etc.

$$g(x) = \begin{cases} x^{1-\varepsilon}/1-\varepsilon, & 0 \leq \varepsilon < 1 \\ \ln(x), & \varepsilon = 1 \end{cases} \quad \text{|| typically convex function.}$$

to calculate the value of ε'

HDI is borrowed from the concept of CAPABILITIES and FUNCTIONING.

Capability is defined in terms of freedom of choices.

Functioning is defined as the actual status/achievement of an individual "do or to be".

COMMODITY → has some characteristics or properties.
(desirable) ↑ (has achievements)

→ if the same commodity is given to different individuals, the achievement may be different for different individuals.

x_i → commodity by individual 'i'.

$c(\cdot)$ → characteristics vector of commodity

$f_i(\cdot)$ → personal utilization function that 'i' actually use.

$F_i(\cdot)$ → set of $f_i(\cdot)$.

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

$b_i(\cdot)$ → achievement

Achievement $b_i = f_i(c(x_i))$

x_i → set of 'x' (Endowment set)

{ $P(X) = b_i \mid b_i = f_i(c(x_i))$ for $x \in X$ } ∈ set of achievements $[P(X)]$

FUNCTIONING ↳

$Q(X) = \{ b_i \mid b_i = f_i(c(x)) \text{ for } x \in X \} \Rightarrow \text{CAPABILITIES}$
for $f_i \in F_i$

Next class. → Examples on capabilities and functioning.

$$\text{Eq. } S_{ab} = R(x(13)) \quad \text{Date: } \dots$$

$$N_{ab} = f(x(13)) \quad \text{Page: } \dots$$

$$C_P = L(x(13))$$

classmate

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WEEK 7

TUESDAY

30.8.2016

Introduction to capabilities and functioning.

x_i : commodity by 'i'

CC): characteristics of commodities.

$f_i(\cdot)$: personal utilization function that 'i' actually use.

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

$h_i(\cdot)$: Happiness function.

$V_i(\cdot)$: valuation function.

X : set of x : Set of Endowment

achievements / Jobs.

$P(X) = \{b_i | b_i = f_i(x) \text{ for } x \in X\}$. \leftarrow || functioning.

$Q(X) = \{b_i | b_i = f_i(x) \text{ for } x \in X \text{ and } f_i \in F\}$.

\leftarrow choices [capabilities].

valuation function is setting the order of precedence in the $Q(X)$ set.

- * Due to restriction in $f_i(\cdot)$, our choices decreases.
- * For poor X set is less, less endowment set in comparison to non-poor.

INFLATION (Indian economy).

3 indicators to measure Economy.

- GDP
- Inflation.
- Unemployment

Inflation \rightarrow continuous increase in general price level.

$$P = \sum_{all p} w_i p_i ; w_i = \text{weight of the } i^{\text{th}} \text{ commodity.}$$

$$\sum w_i = 1.$$

p_i = price of i^{th} commodity.

$$w_i = \frac{Q_{ib} p_{ib}}{\sum Q_{ib} p_{ib}}$$

$$\bar{P} = \frac{P_t - P_{t-1}}{P_{t-1}}$$

How inflation is measured in India?

Ans.

① GDP Deflator = Nominal GDP / Real GDP

② Wholesale price index (WPI) // (Retail PI)

or (Producer's price index) \hookrightarrow {intermediate goods} $\begin{cases} \text{does not include services} \end{cases}$

③ Consumer price Index (CPI) // {Retail PI} {data taken from Public
or (Standard of living index)} $\begin{cases} \text{Ministry of Finance} \\ \text{Ministry of Home Affairs} \end{cases}$

* In India, we get the CPI with a lag of two years.
{so GDP deflator is not used practically}

* 3 monitoring instruments to control inflation -

- Repo Rate.
- Reverse Repo Rate.
- Bank Rate.

* Retail price (consumer / single unit)

Bulk (wholesale price) { shopkeepers / bulk units}.

* Wholesale price index is compiled by Ministry of Industry and Commerce & central statistical organization (CSO)

* In case of consumer price index ; services are included and intermediate goods are not included unlike the wholesale price index.

* Prices vary across the geographical area as well as the different sections of people

Some CPI

Rural, urban, Industrial worker, Agricultural worker

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- * DA allowances increase/decrease is decided by the CPI - Industrial Worker.

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6.9.2016 (1) GDP Deflator

- ② WPI → wholesale price index. // (does not include services/include intermediate goods)
- ③ **CPI** → consumer price index. // (include services/include intermediate goods)
 - CPI-R (Rural)
 - CPI-U (Urban)
 - CPI - Total/Avg
 - CPI - AL. (Agricultural labour).
(signifies standard of living)
 - CPI - IW (Industrial workers)

GOODS

- ① Ag Primary goods (Agricultural) → food, non-foods.
- ② Fuels etc
- ③ Manufacturing goods-
- ④ CPI others (services).

$$\text{general price index} = \bar{P} = \sum w_i p_i$$

- * since agricultural labours produce foods, more weightage.
so it is given similarly for industrial workers. so different kinds of CPI are given.
- * in Rural area, Rent weightage is less.

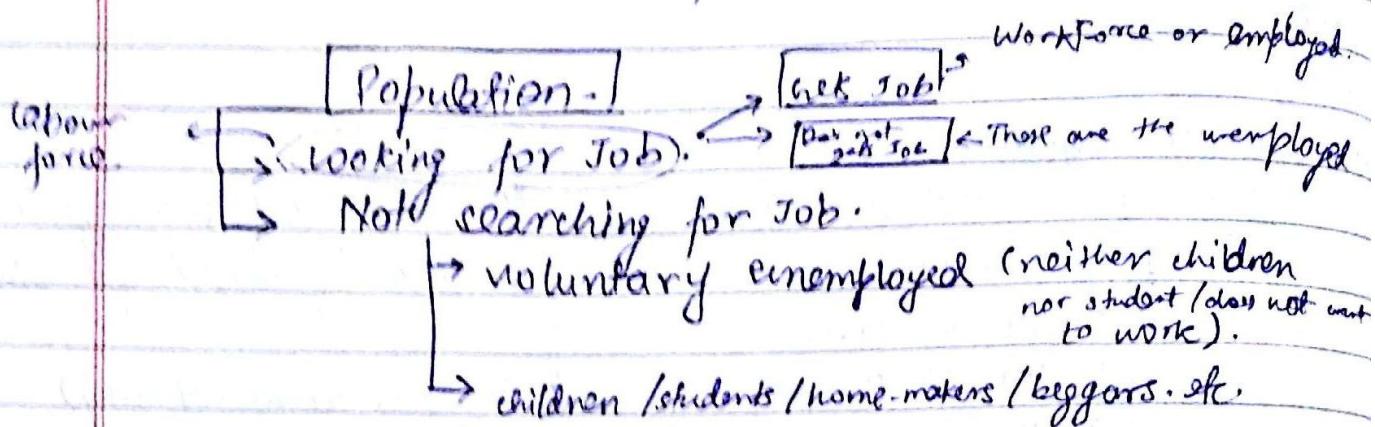
For an economic progress, 3 indicator are there.

- ① GDP → should be high
- ② inflation → should be low.
- ③ unemployment Rate (UR).

UNEMPLOYMENT

Labour Force Participation (LFP)

Work Force Participation (WFP).



- * Any one who produces some goods or services are called Employed.
- * Beggar's outfit is sympathy which is neither goods nor services (not considered in economy)

There are 4 criteria's to decide unemployment -

- ① Willingness. { In India, we use three criteria. } reservation wage
- ② Time { Willing to work at the "existing wage rate" }
- ③ Income. { rarely used }
- ④ Productivity

Time Criteria → Major Time Criteria. (majority of time what we are doing).

Income → A threshold level is there to decide unemployment.

Productivity → similarly a productivity level is there to decide unemployment.

National Survey Sample conduct:

Employment and Unemployment Status.

Question:

first → Are you willing to work?

second → Most of days in year last year, what have you done (180 days or more). [Principal status].

Reference period = 1 year

third → Second ~~not~~ subsidised status {30 - 180 days}. Status
It is possible to be unemployed in principal status and may be employed in subsidised status.
These are 2 status.

fourth → In the last week what have you done in majority of time. [CWS: Current weekly status]

fifth → In the last day what you did. [CDS: Current daily status] {8 hours or more}.

* These are major measures of unemployment.

In India

PS - UR.

SS - UR.

CWS - UR.

CDS - UR

In India, (PS + SS) unemployment rate is 20%.

(2011-2012).

* In case of developed countries, unemployment rate is higher than developing countries.

Developed countries → unemployment Rate is:

6 - 7 %.

* Therefore, it is ~~often~~ argued that unemployment ~~rate~~ is not a good measure ~~for~~ of progress in a economy.

Q. why the developing countries have low rate of unemployment

- Because there are different types of unemployment rate.
- disguised unemployment
- under Employment

These 2 types of Unemployment Rate is higher in developing countries. There are more such OR also.

These are following VR -

- ① Structural VR // open.
- ② Frictional VR. // covered.
- ③ Seasonal VR. // covered.
- ④ Disguised VR // covered.
- ⑤ Under VR. // covered.

- * Structural VR is attached to the structural transformation of economy. (Agricultural workers does not have skills to fit into industrial work, so gets unemployment).
- * During the switching from one job to other, the individual is unemployed. (Frictional).

Structural and Frictional unemployment are not problematic (we can give skills to Agricultural workers to work in industries), Frictional Unemployment is temporary).

- * we work only for some periods of the years (like in case of Agricultural workers, does work only during certain seasons to grow crop, does not work so unemployed in the rest of the year). {Seasonal}

- * Disguised Unemployment - Appears to be employed, but does not produce ~~any~~ any output, so are unemployed.
e.g.: { 8 persons in a house produce 200 kilos of food.
1 person leaves for job in city, but still the 7 persons produce 200 kilos of food., so the 1 person does not contribute anything, he is disguised. }

The individual who appears to be employed but his marginal productivity is zero or negativity.

* Under Employment:

If ~~not~~ a worker has potential Marginal productivity > Actual Marginal productivity.
(has potential to do more, but actually does less).

⇒ In Developing countries, Disguised UR and Under employment are paramount.

(These ~~are~~ two one serious problem, more serious is the Disguised Unemployment).

⇒ In India, GDP of agricultural is increasing but the no. of workers is decreasing. (due to disguised unemployment)

∴ Unemployment Rate is not a good measure of economic growth.

Another problem, "Child labour" (neither they work, nor they go to school, but are ~~not~~ calculated under PS-SS).

Next Class - How to measure Disguised unemployment

27.9.2016

POVERTY

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problems:-

- identification problem (\rightarrow know how is poor)
- Aggregation problem

IDENTIFICATION PROBLEM

- There is a threshold level of income (I^*).
if ($I_i < I^*$) then ~~as~~ it is said to be poor.
- But the income ~~is~~ cannot be measured of individuals other than government (eg - cultivators etc.).
- Then consumption expenditure level is decided as threshold (C^*)
if ($C_i < C^*$) then poor.
But consumption expenditure is often ~~not~~ household expenditure
 \therefore individual consumption expenditure is ~~not~~ there.
- So the concept of per-capita Household ~~of~~ consumption exp.
(In this, we do not look at the intra household exp. distribution
Normally, adults ~~are~~ consume more).

This results in higher malnutrition in children and women.

- In India, we use "Monthly per capita ^{consumption} expenditure" (MPCE), not the income method.
- World statistics \$1.25 per day per person to decide poverty (threshold level).

- How do we come to C^* ? How it is decided?

Based on Nutritional Norms for C^* .

It was done in India first - 1973 (Planning Commission government of India)

Activity level - Age - Sex

separately for Rural and Urban Area.

In Rural - 2400 kcal. per day / per person.

In Urban - 2100 kcal per day / per person.

Consumption expenditure are in rupees. How to convert calories into rupees.

"National Sample Survey" \rightarrow consumption expenditure.

Decile → divides in 10 parts.
percentile → divides in 100 parts.

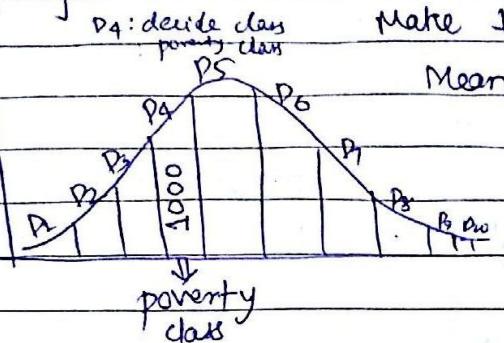
$$\text{odd} = \frac{n+1}{2}, \text{ even} = \frac{n}{2} + \frac{1}{2}$$

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$$\text{Median} = 50^{\text{th}} \text{ percentile } \{ (n+1) \times 0.5 \}$$

$$\text{Decile} = 10^{\text{th}} \text{ percentile } \{ (n+1) \times 0.1 \}$$

e.g. frequency



Make ten groups (decile) & (decile classes).

Mean calorie of D4 = 2408 kcal.

Decile class divides a distribution into 10 equal parts. (Means divides a symmetrical distribution into 2 equal parts).
Decile - a statistical formula.
→ a statistical concept.

2 calculate avg. food expenditure

Deciles are P10, P20, P30, ...

Median is P50.

{ Calculate avg. non-food expenditure.

Take the ~~avg.~~^{Addition} of these two. (Excluding education & health)

Suppose avg. food exp. = 10

avg. non-food exp. = 8.

first calculation done in 1973. so 10+8 = 18 → is the poverty line.

→ Once this poverty line was set up, for next poverty calculation we just multiply with the inflation rate.

→ The problem in this is that the commodity basket in the base year changes drastically year after year. (This is not captured here).
∴ The poverty line will be lower.
(Underestimating the poverty line).

→ For this reason, in 1993, reestimated the poverty line (KHANDELWAL COMMITTEE).

→ In Ranrajan committee, the nutritional norms were changed R → 2155, V → 2090 kcal per person/day
Because the manual labour has been reduced (mechanised techniques introduced).

→ In India, we have state level poverty line (not aggregate country).
Because India is a large diversified country, food habits are different, (e.g.: In Bengal → fish and rice, In Kerala → non-veg, In north India → veg. more pronounced).

so we poverty line for different states (Urban & Rural).

AGGREGATE PROBLEM.

⇒ Head count ratio. $H = \frac{q}{N}$ $q \rightarrow \text{no. of poor}$
 $N \rightarrow \text{population}$. $z \rightarrow \text{poverty line}$.
 $= \frac{1}{N} \sum_{i=1}^N I (c_i < z)$. $c_i \rightarrow \text{consumption expenditure}$
 $\text{of } i^{\text{th}} \text{ individual.}$

if $c_i < z$, $I = 1$ else $I = 0$.

→ Head count ratio has a limitation.

| Ex:- | <u>A</u> | <u>B</u> | $z = 125$ |
|--------------------------------|----------|----------|-----------|
| | 100 | 124. | |
| | 100 | 124. | |
| | 150 | 150 | |
| which \rightarrow | 180. | 150. | |

which country is poor?. But $H = 2/3$ for both.

(A) But (H) is not telling that.

limitation of Head count ratio. It does not take into account shortfall ^{from the poverty line.} of 2t treats ~~into~~ '0' or '100' as same.

→ Dalton principle. → says that a measurement of poverty should increase if resources or income is given from a ~~poor~~ poor to ~~non-poor~~ non-poor.

Head count ratio does not satisfy this dalton principle.
 measures ~~to~~ to measure poverty.

⇒ Poverty gap. ⇒ square Poverty gap → serial poverty index.

$$\hookrightarrow g_i = (z - c_i) * I (c_i < z).$$

$$P_G = \frac{\sum_{i=1}^n (g_i)}{z} \left\{ \text{poverty gap} \right\}^2.$$

⇒ Square poverty gap.

$$P_G^2 = \frac{1}{z} \sum_{i=1}^n (g_i)^2.$$

Poverty gap & also sometimes square poverty gap does not satisfy.

Dalton principle though it took into the account shortfall from poverty line.

→ Sen's poverty index. { formal derivation, see the paper of Amartya Sen on poverty in 1981}

$$S = H \left[1 - (1 - G^P) \frac{M^P}{z} \right]$$

H = Head count ratio

G^P = Gini coefficient among the poor.

M^P = Mean consumption expenditure of the poor.

→ follows Dalton's principle and poverty gap principle.

$$G^P = \sum_{i=1}^N \left(\frac{G_i}{z} \right)^2$$

$$\text{FGT}, \alpha = 2 \quad G^{\alpha} = \sum_{i=1}^N \left(\frac{G_i}{z} \right)^{\alpha}$$

Next class → More on FGT, Dalton principle, Sen's poverty index.

WEEK - 19

TUESDAY

18.10.2016

DALTON'S PRINCIPLE → If transfer of income is done from non-rich to rich among the poor, then the measurement of poverty should decrease.

$$\text{SEN'S POVERTY INDEX} \rightarrow P^S = H \left[1 - \left(1 - h^P \right) \frac{m^P}{Z} \right]$$

h^P = Gini-coefficient among the poor

m^P = mean income of poor.

Z = poverty line.

H = head count ratio.

→ Sen's Poverty Index follows Dalton's principle.

→ Gini-coefficient measures the inequality among the poor
(How to measure Gini-coefficient?).

Lorenz Curve.

| <u>INCOME</u> | <u>No. of person (f)</u> |
|---------------|--------------------------|
| 80 | 20 |
| 10 | 30 |
| 50 | 15 |
| 20 | 35 |
| | 100 |

→ first write the income in increasing order.

INCOMENo. of persons (f)

30

300

20

35

700

50

15

750

80

20

1600

cumulative frequencycumulative income.standardized
~~income~~
frequencystandardized
~~frequency~~

30

300

300/3350

30/100

65

1000

1000/3350

65/100

80

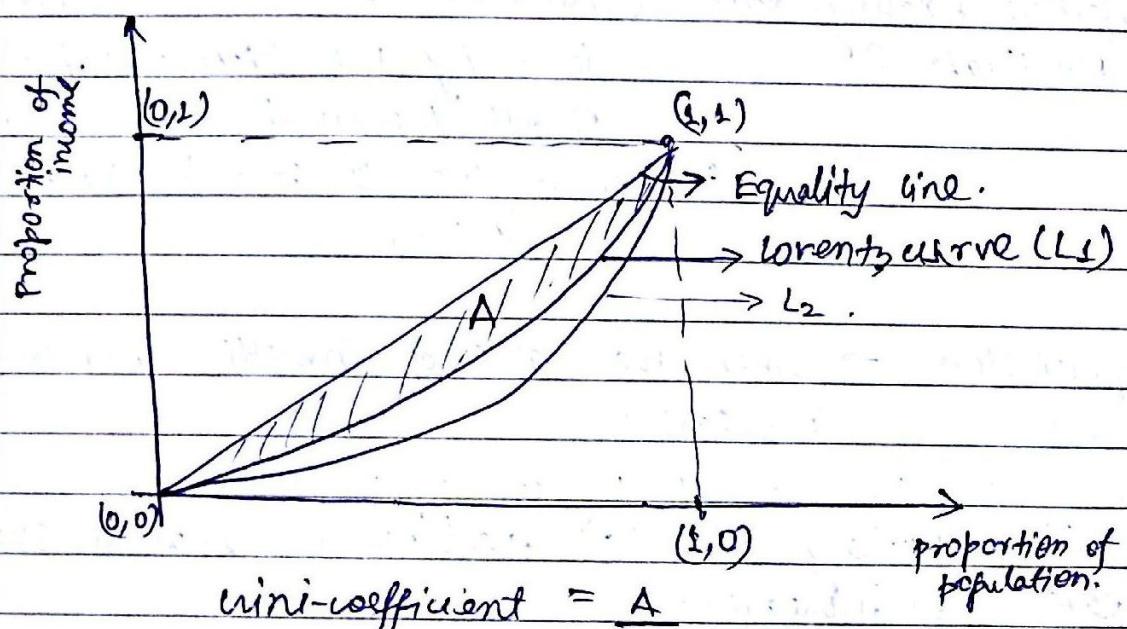
1750

1750/3350

80/100

100

3350

3350/3350
(=1)100/100
(=1)

(0.5) → Area of lower triangle

- mini-coefficient measures the area of the base square of the inequality among the poor.
- The more away the mini-coefficient from the equality line, more is the inequality.
- if the Lorenzt curve is from $(0,0)$ to $(1,0)$ and then from $(1,0)$ to $(1,1)$ then it is perfect inequality : ($G=1$) all the income to an individual and no income to anyone else.

consumption & investment function
(discussed in macroeconomics).

$$GDP = C + I + G + \frac{\text{fiscal policy}}{\text{Balance of payments}} + \frac{(X - M)}{\text{foreign sector.}}$$

Exchange Rate \rightarrow price of a foreign currency in terms of domestic currency.

e.g:-

direct exchange rate \rightarrow £60/\$ (E).

indirect exchange rate \rightarrow \$1/\\$60 (£) ($1/E$)

\hookrightarrow it is an example of \rightarrow Bilateral (foreign currency) exchange rate. (\Rightarrow two currencies are compared)

\Rightarrow Effective Exchange Rate (maintains a general currency (Multilateral) level by the effective proportion of all the currencies over the globe)
 $\left\{ \begin{array}{l} \text{similar to that of general price level in} \\ \text{Inflation} \end{array} \right\}$

Appreciation \rightarrow when the value of domestic currency (of domestic currency) increases.

e.g.: money increases when we pay less for some other currency.

direct Exchange rate (E) declining or Indirect Exchange rate ($1/E$) increases.

Depreciation \rightarrow when the value of domestic currency (of domestic currency) declines.

direct exchange rate (E) increase or Indirect Exchange rate ($1/E$) decrease.

Another concept-

\rightarrow Nominal Exchange Rate (E)

\rightarrow Real Exchange rate (e)

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- * Real Exchange Rate comes when inflation of the domestic and foreign exchange rate of currencies.

$$E = \frac{1 + P_F}{1 + P_D}$$
$$= E \left(\frac{P_F}{P_D} \right)$$

$P_F \rightarrow$ inflation of foreign currency.
 $P_D \rightarrow$ inflation of domestic currency.

- * if $P_D > P_F$ (and E constant)
then Appreciation happens.

→ when there are higher inflation rate in domestic currency.
then E is adjusted.

* Similar concept as General Price level in Inflation.
Effective Exchange Rate = {General Price level.
 $= (W_1 P_1 + W_2 P_2 + \dots)$ }

Nominal Effective Exchange Rate = $(W_1 E_1 + W_2 E_2 + \dots)$
(NEER)
weight.

E_1, E_2, \dots are direct exchange rate of different countries.
 w_1, w_2, \dots are trade shares of domestic country (e.g.: India)
with different countries.

$$\text{Trade (T)} = X + M.$$

$$\text{eg: } w_1 = \frac{X_{\text{US}} + M_{\text{US}}}{X_I + M_I} = \frac{T_{\text{US}}}{T_I} = \text{trade with India.}$$

$$\text{Real Effective Exchange Rate.} = \frac{\text{NEER}}{\text{NEER}} \left(\frac{P_F}{P_D} \right).$$

* $\left\{ \text{NEER} \neq \frac{1}{\text{NEER}} \right\}$ because E_1, E_2, \dots can be equal to $\frac{1}{E_1 E_2}$
but w_1, w_2, \dots cannot be equal to $\frac{1}{w_1 w_2}$
because. US total trade is different
than India.
 $\left\{ \text{can be equal to } \frac{1}{E} \right\}$

\bar{x} : rate of change of x.w.r.t time.

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$$\frac{\partial e}{\partial t} = \bar{e} = \bar{E} + (\bar{P}_F - \bar{P}_D).$$

Next class :- Balance of Payments (BOP).

WEEK-15

TUESDAY

25.10.2016

BALANCE OF PAYMENTS (BOP)

- All business houses keep a record (accounting statement) of what they sell and buy. When they receive money (credit), when they give money (debit).

Accounting Statement (BOP)

The flow of money
of business

| CREDIT | DEBIT |
|-----------------------------------|---------------------------------------|
| → onto | Out. |
| Exports (X) | Import (M) |
| Investment by foreigners in India | Outward foreign investment by Indians |

1991 → Major Economic Reform in India.

- Similarly we do this for a country who exports to outside country (consumers) and Imports from outside countries.

known as Balance of Payment.

① Current Account

② Capital Account

③ Errors and Omission

④ Foreign Exchange Reserve.

① Current Account

② i) Visibles / Goods -

(Ministry of Commerce)

ii) Invisibles

a) Services

b) Factor Income.

CREDIT

Export

Import (X^1)

DEBIT

Import

Export (M)

Export

Import (X^2)

IR (received)

Import (X^3)

Ipay (payment)

4 modes of Trade in Services -

- ① Neither the producer nor the consumer moves.
e.g.: Offshore Software Services. (location), call centre.
- ② when both producer and consumer moves.
e.g.: In Health services
- ③ when producer moves but not the consumer.
e.g.: On-site software services.
- ④ when consumer moves but not the producer.
e.g.: Tourism

→ It is difficult to keep a record in Trade in Services.
therefore we have Errors and Omission Account.

Factor Income -

- Labour
- Capital
- Entrepreneurship.
- Land.

income.

* Factor is very less of the total share so mostly services are considered in invisibles.

| | <u>CREDIT</u> | <u>DEBIT</u> |
|---|---------------|-------------------|
| iii) Unilateral Transfer (we do not have to pay or do not get what we pay). | UTR (receive) | UT pay. (payment) |

$$\therefore \text{Current Account} = X^G - M^G + X^S - M^S + \text{Net UT}$$

* Net Factor Income + Net UT is very less (negligible).

$$\therefore \text{Current Account} = (X^G - M^G) + (X^S - M^S) = X - M.$$

$$GDP = C + I + G + CA.$$

$$\text{Total income} \Rightarrow Y = C + S + I + \underset{\text{conflict say taxes}}{\text{GDP}} = C + I + G + CA.$$

$$\therefore C + S + T = C + I + G + CA.$$

$$\Rightarrow (S - I) = (G - T) + CA.$$

If the government has a Balanced Budget ($G = T$).

$$\Rightarrow S - I = CA.$$

If $I > S$ then $M > X$ (deficit). $\{CA < 0\}$.

When the domestic saving is less than investment then you can bridge (improve) the economy by adjusting CA ($M > X$). (Current Account deficit)

When $X^G > M^G \Rightarrow$ Trade Surplus. {only the goods trade.}

$X^G < M^G \Rightarrow$ Trade Deficit.

$X^G = M^G \Rightarrow$ Trade Balance.

When ~~$X^G = M^G$~~ $X^S = M^S \Rightarrow$ Invisible Balance.

$X^S > M^S \Rightarrow$ Invisible Surplus.

$X^S < M^S \Rightarrow$ Invisible Deficit.

NEXT CLASS \rightarrow Implications of $S - I = G - T + CA$. and
BOP continued.

WEEK-26

TUESDAY

1.11.2016

Balance of Payments (BOP)
double Entry book keeping.

Current Account:

$$CA: X^G - M^G + X^S - M^S + \text{Net factor Income} + \text{Net UT.}$$

$$CA = (X^G + X^S) - (M^G + M^S) + A$$

$$CA = (X - M) + A$$

$$GDP = C + I + G + (X - M) = C + I + G + CA.$$

$$\text{Income approach: } GDP = (C + S + T) = C + I + G + CA.$$

$$\therefore [S - I = (G - T) + CA]. - i$$

Economic Survey - ch. 6. of India's BOP }
Read from any Macro-Economics (External Trade) about BOP.

sector classmate
about BOP

- ① Government has a balance budget $\rightarrow CA = (S - I)$
{ income = expenditure }
when $I > S$, $CA < 0 \Rightarrow X < M$ { surplus } { deficit } CAD
 $I < S$, $CA > 0 \Rightarrow X > M$ { surplus } current account deficit.
 $I = S$, $CA = 0 \Rightarrow X = M$ { Balance }.
- * When the domestic savings is insufficient to support the investments then the gap is bridged by $(CA < 0)$.
- ② Surplus Budget of the government:
{ income > expenditure } $T > G \Rightarrow$ saving by government = $S - G$
- Savings = Investment $\Rightarrow S = I$
 $\Rightarrow T - G = CA$
 $\rightarrow G > T$; $CA < 0$. \Rightarrow CAD { current account deficit }.
Budget deficit
 - * In India, there is a budget deficit so CAD is in India { 6.5% → 2012 } { 3.4% → 2016 }
if $S \leq I$, then budget deficit will lead to higher CAD.
 - * In Japan, there is a higher budget deficit but no CAD because they have high domestic savings than investment.
 - Austerity Policy \rightarrow to reduce the expenditure.
 - * Agriculture income is tax free in India.

BOP:

① Current Account

② Capital Account

INVESTMENTS { a) Foreign Direct Investment (FDI). }

{ b) Portfolio Investment (FII) }

LOANS { c) Commercial borrowings. }

{ d) Short term borrowings. }

LOANS & INVESTMENTS are part of Capital Account.

As a young country like India, wants to leave the benefits of demographic dividends. so immigration increases -

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CREBIT

FDI:

Inward (foreign investing in India)

Portfolio investment:

Inward

DEBIT

Outward. (Indian investing outside India)
Outward.

∴ FDI is more durable than Portfolio investment.
Reversing the FDI is difficult than FII.

"Role in Management" distinction lies in "Role in Management".

Voting, Decision opinion, justification in case of FDI.
No role in management in case of FII.

If the borrowing is less than 1 year → short term borrowing.
" " " " " more " " " → commercial or long term loan.

(e) Assets of Commercial Banks.

Eg.: SBI branch in London, foreign currency is Assets (Bank's liabilities). (CREDIT)

(3) ERRORS AND OMISSION → arises because we follow a floating investment.

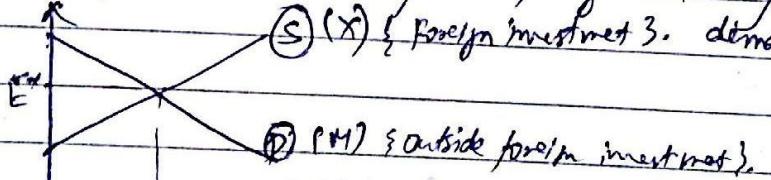
{ due to late track recording }.

{ foreign entry in Indian records, no record kept }.

$X > M$

Exchange Rate → Price of the foreign currency. { determined by the demand & supply }.

(S)(X) { Foreign investment }.



→ ↑ Foreign currency.

They now want foreign investment in India?

They would deposit foreign currency in SBI, then get returns based on the Exchange rate.

Supply of foreign currency (S_F) > (D_F) { Supply of foreign Exchange Reserve. }

{ Supply of foreign currency }.

- For foreign Exchange Reserve :-
- Reserve of foreign currency with IMF (International Monetary funds).
 - Reserve with Central Banks (RBI).

WEEK-VI
MONDAY

If $(S_Fc) < (D_Fc)$, then foreign Exchange Reserve decreases.

7.11.2016

$$CA = (X^G + X^S) - (M^G + M^S) + \text{Net factor income} + \text{Net VT.}$$

$$CA = (X - M)$$

- ① Balance Budget ($G = T$)

$$(S - I) = CA.$$

$S < I \Rightarrow CA < 0 \Rightarrow CAD$ (Current Account Deficit).

Also true when ($G > T$)

But $G < T \Rightarrow S^G$

- ② $S = I$

$$-CA = (G - T)$$

$$\text{or } CA = T - G$$

Deficit Budget $\Rightarrow G > T$.

$\Rightarrow CA < 0 \Rightarrow CAD$.

WHAT IS GLOBALIZATION?

HOW THIS GLOBALIZATION LEADS TO ECONOMIC GROWTH?

Is Globalization only movement of goods and services?
Economic integration is the main pillar of globalization
and not the only thing.

It is 3 things -

- ① Economic Integration

- ② Political Integration

- ③ Socio-Cultural Integration. { provide both as help.
{ catalyst as well as spoiler of globalization.

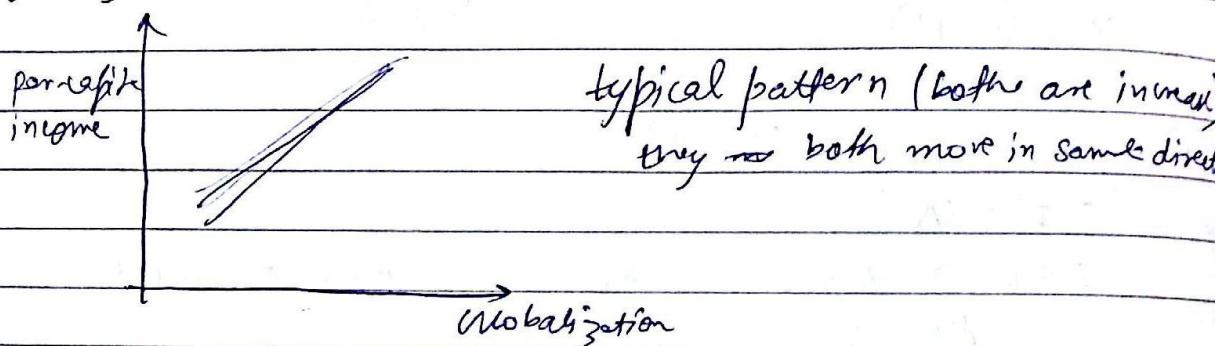
Political and Socio-Cultural Integration is the pre-requisite for Economic Integration.

Globlalization = Economic = $\frac{X+M}{GDP}$ (narrow definition
Integration of globalization).

Broader measure of globalization

$$= \frac{\text{Current Account} + \text{Capital Account}}{GDP}$$

$\left(\frac{X+M}{GDP} \right)$ = Trade intensity (measure the Globalization level)



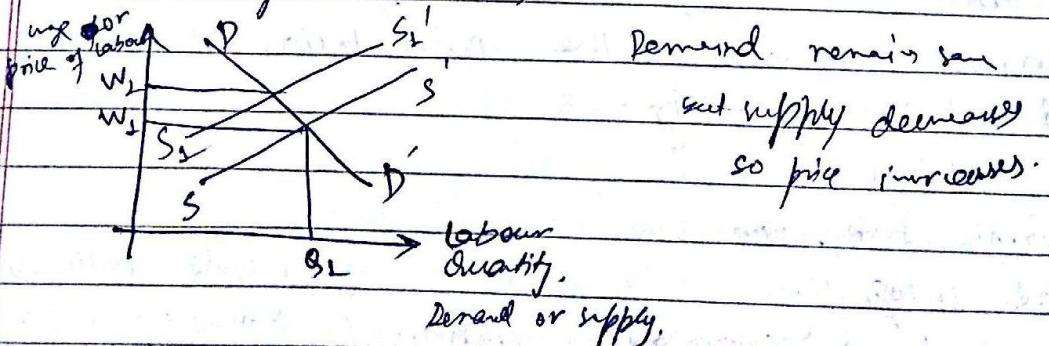
per-capita income increases due to increase in Globalization
(it holds true for India & East-Asian Tigers)

Reasons behind this ↑

- ① Mobility of Labour.
- ② Mobility of Capital.
- ③ Increase in production.

④ How mobility of labour increases → Globalization.

→ More mobility, so mobility happens. so per-capita increases.
But only a few very few percent goes out of India. so how it affects per-capita income. It affects the residents not gone outside.).



$W_1 \rightarrow$ wage before immigration.

$W_2 \rightarrow$ wage after immigration.

Macroeconomics

② Mobility of Capital. (physical and financial capital).

↳ Now it leads to increase in per-capita income.

"Make in India".

↳ aiming for foreigners to invest in India.

Foreigners bring in new technology (e.g.: typewriter) which increases the productivity which increases the per-capita income.

e.g.: Agriculture

£8000 by 8 people so Avg. production = £1000.

Due to foreign investors and new technology the avg. production increases. Some payment given to acquire new technology.

③ Increase in Production.

Economy 1.

(prior to Globalization)

{closed Economy}.

In 2016 Resources \leftarrow 1000 units.
(given). produce.

Population \leftarrow 800 units
(given) consume

Balance in 2016
 $= 200$ units

In 2017 produce \leftarrow 600 units.

As production declined, can produce 1000 units but only 600 produced.

GDP declined due to less production so per-capita income decreased.

Economy 2.

(after Globalized).

{open Economy}

Rest of the world also demands.
so we would sell the balance of 200 units for the demand
 $= 400$ units; Balance = 0.

so in the next year we would increase the production to 1200 units.

{so production increases}.

Indian Economy:

WEEK-5

TUESDAY

8.11.2016

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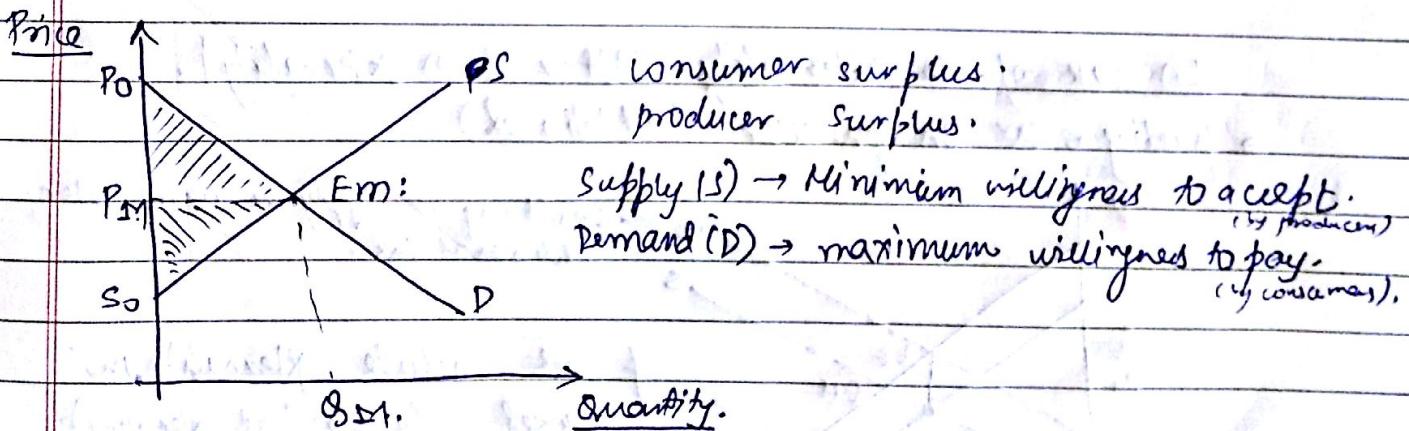
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EXTERNALITY

- * Uncompensated effect of consumption/production on a third party.
- Negative External Effect (Externality).
 - Eg:- passive smoking.
- Positive Externality → gives benefits to the third party without of him paying a bate.
 - Eg:- electric bulb in the corridor.
- (+ve) & (-ve) Externality does not reflect on 'Market Outcomes': what are the market solutions?

For Negative Externality:

For production of gasoline → Air pollution.
Monetarizing the externality is the most difficult task in including in Market Solutions.



Before Externality Market solution.

→ Em (solution): is Pareto-optimal solution.

Pareto optimal (or efficient), → it is a situation where one cannot improve someone's welfare without reducing others.

Pareto-improvement

- Market solution is the Pareto-optimal solution.
 - ↳ Agents are consumers & producers.

continued from graph

willing to pay → Area OP_0EM in QM.

Actual paying → Area OP_1EH in QM.

Consumer surplus → Area P_0PMEM . (CS)

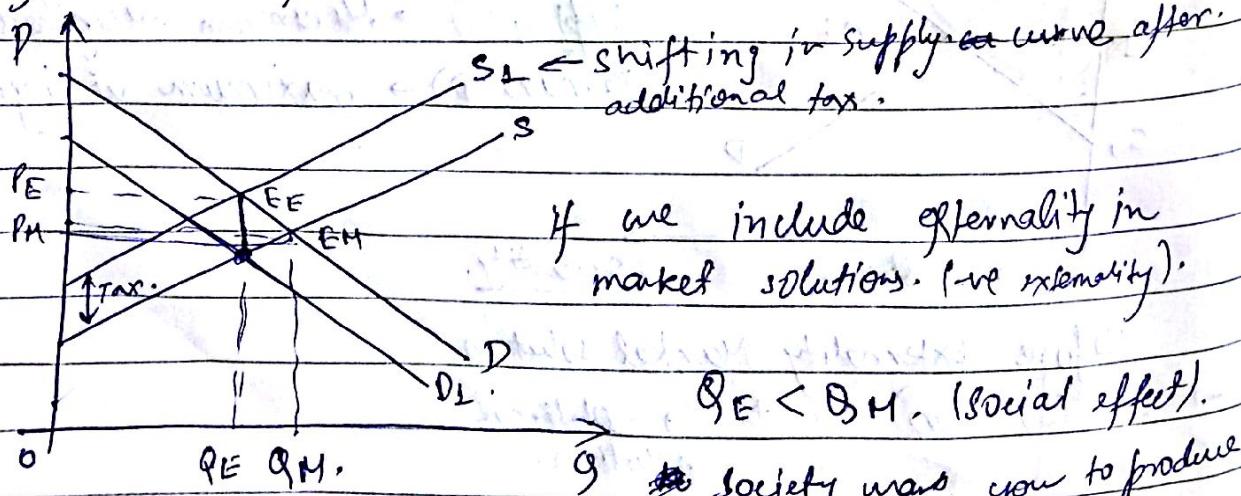
Similarly for producers.

Producers surplus → Area $SPMEM$. (PS)

Cannot increase PS without decreasing CS. (Pareto-optimal solution)

In case of ~~no~~ externality, (After (re) externality).

- putting a tax on producer (additional)



- putting a tax on consumer.

Then also $Q_E < Q_M$.

or on both tax on producer or consumer then $Q_E < Q_M$.
(re) Externality).

On (In) Externalities, \rightarrow Production is more.

Society wants to you to produce more.

Additional subsidy given to producer or consumer.