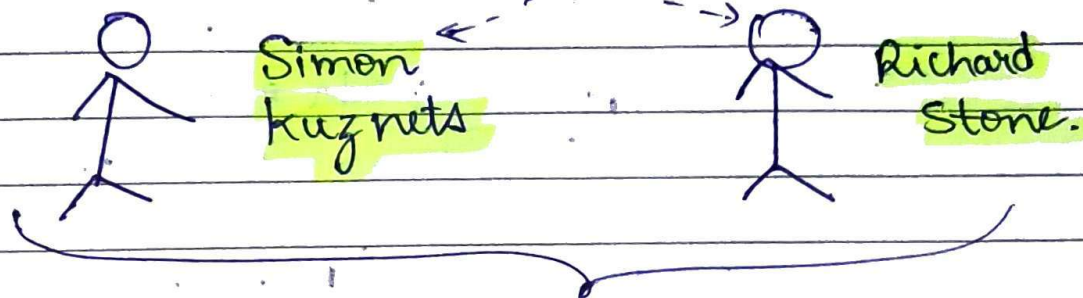


# Determination of national Income

(8-10 marks)

## Unit -1 :- National Income Accounting.



- \* The Central Statistical Organisation (CSO) in the Ministry of Statistics & Programme Implementation (MOSPI) is responsible for the compilation of National Accounts Statistics. At the State level, State Directorates of Economics & Statistics (DES) have the responsibility of compiling their State Domestic Product and other aggregates.



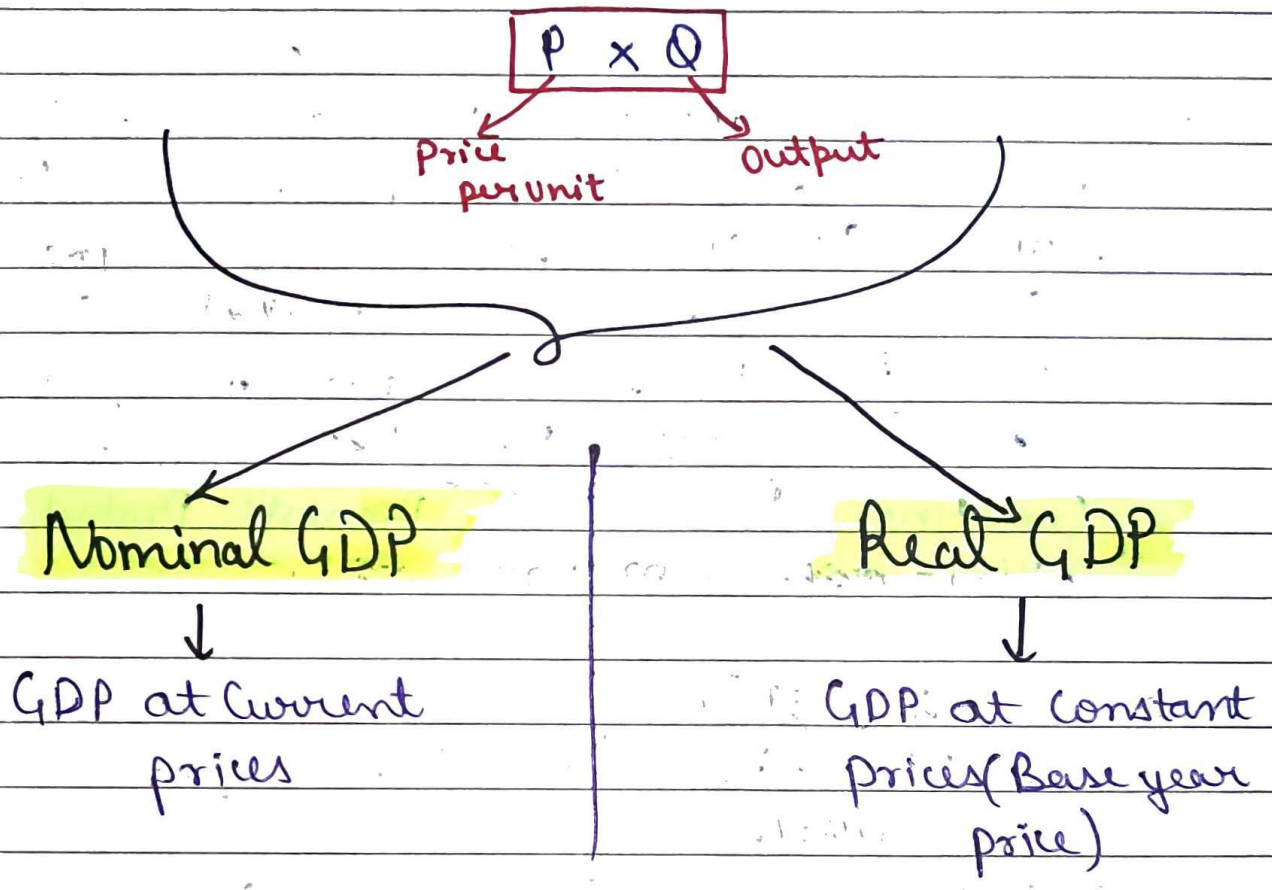
**WHY??**

USEFULNESS??

- helps Business to forecast future demand of products
- It shows composition & structure of National Income.
- It helps the government in making policies.
- International "Comparisons"

→ Concepts of national Income.

① Gross Domestic Product (GDP) - It is the money value of all final goods & services produced in the country with in a given period.



eg

Year	Price	Output
2000	£10	100
2025	£40	90

we are in year 2025

GDP = £40 × 90  
(Nominal) = £3600

GDP = £10 × 90  
(Real) = £900

$$\textcircled{2} \quad \text{GDP Deflator} = \frac{\text{Nominal GDP} \times 100}{\text{Real GDP}}$$

(Consumer Price Index)

Eg. 1

Nominal GDP = 1200 Crore  
 Real GDP = 1000 Crore.

find GDP Deflator.

Sol. GDP Deflator =  $\frac{1200}{1000} \times 100$   
 = 120

Gol-Gappe ₹100 केत → अत Gol Gappe ₹120

Year	Price Index	Output	Value
2000 (Base)	₹ 100	100	₹ 10,000
2025 (Current)	₹ 120	100	₹ 12,000

Eg. 2

Real GDP = 450      Price Index = 120

find Nominal GDP

Sol.

$$PI = \frac{\text{Nominal GDP} \times 100}{\text{Real GDP}} \Rightarrow \frac{120 \times 450}{100} = \text{Nominal GDP}$$

DOMS

Nominal GDP = 540

$$\frac{90}{450} \times 100 = 20\%$$

इतने से महंगाई बढ़ गई।

### ③ Inflation Rate :- (Year 2)

$$\frac{\text{GDP deflator (Year 2)} - \text{GDP Deflator (Year 1)}}{\text{GDP deflator (Year 1)}} \times 100$$

उदा

$$\text{Class 12} = \text{GDP Deflator (2023)} = 150$$

$$\text{CAE} = \text{GDP Deflator (2024)} = 165$$

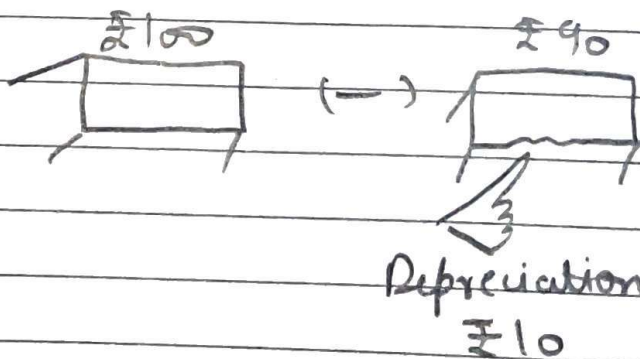
$$\therefore \text{Inflation Rate} = \frac{165 - 150}{150} \times 100$$

$$= \frac{15}{150} \times 100 = 10\%$$

महंगाई 10% से बढ़ गई  
पिछले साल के (Comparison में)

### ④ Depreciation = GROSS - NET

(Consumption of fixed Capital)



11

$$* \text{GDP}_{mp} \text{ (-) Depreciation.} = \text{NDP}_{mp}$$

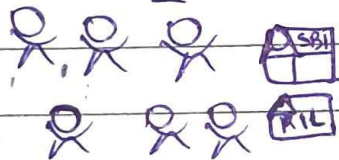
↓  
Gross

$$* \text{NDP}_{mp} \text{ (+) Depreciation} = \text{GDP}_{mp}$$

↓  
Net

### ⑤ Net factor Income from abroad (NFIA)

$$\text{NFIA} = \text{National Product (National Income)} - \text{Domestic product (Domestic Income)}$$



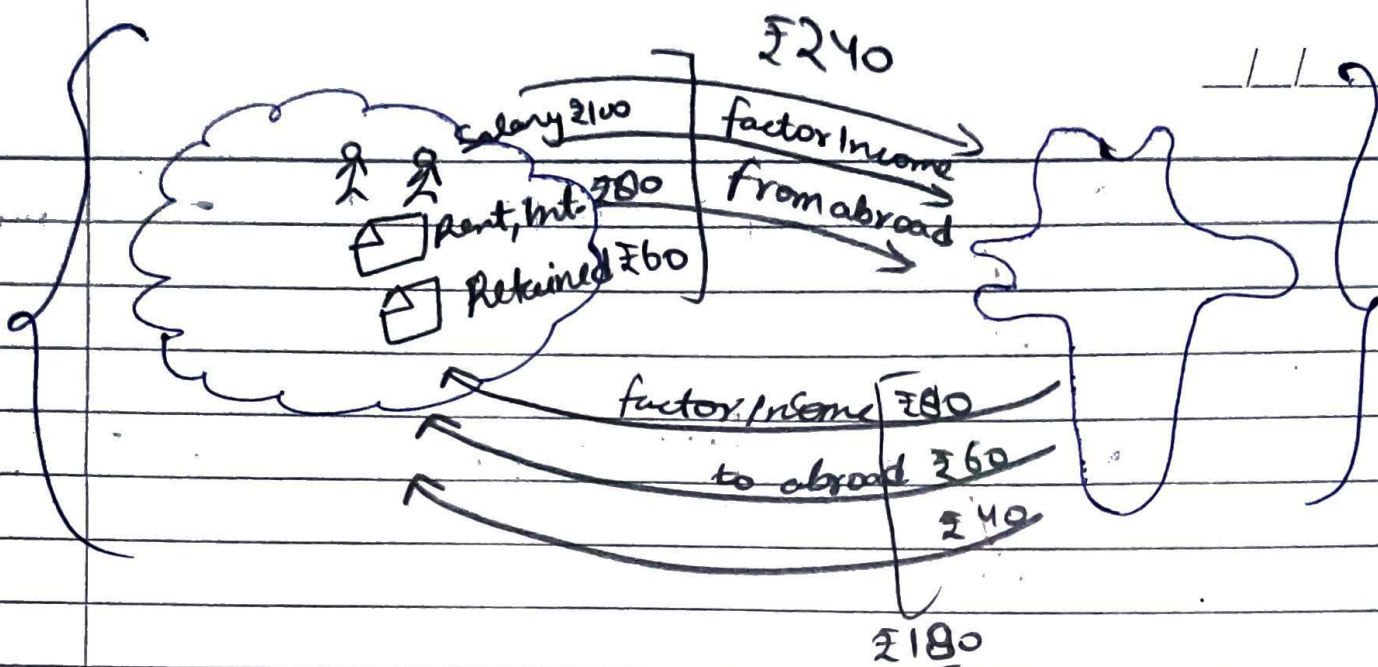
RESIDENTS  
Income.

**NOT Geography Based**



**TERRITORY Based (Geography) Concept**  
(NOT Resident based)

$$* \text{NFIA} = \text{Net Compensation of Employees} + \text{Net Income from property \& Entrepreneurship} + \text{Net Retained Earnings.}$$



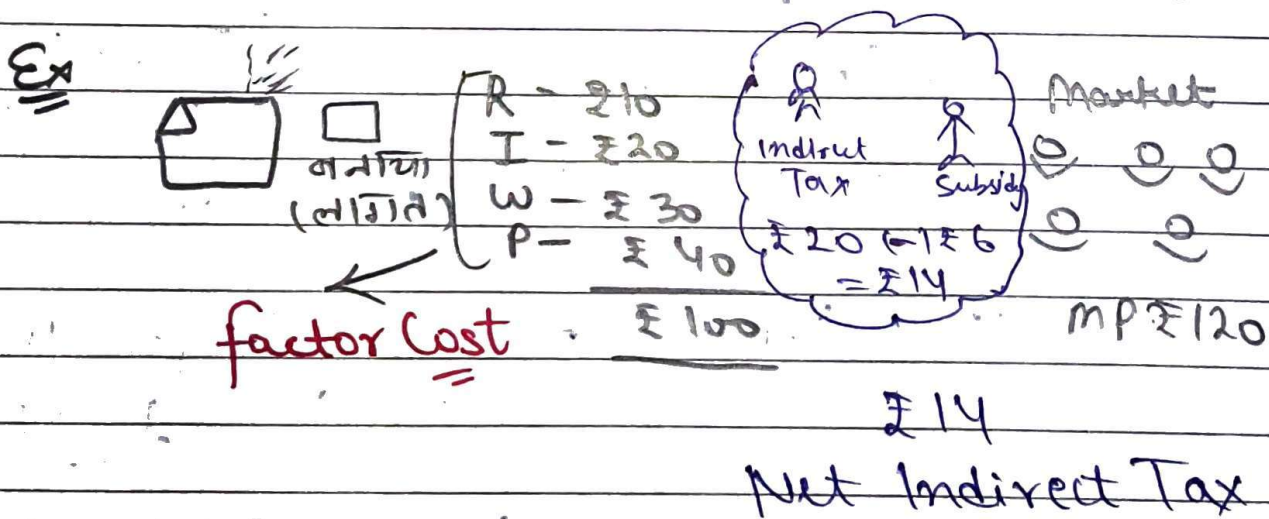
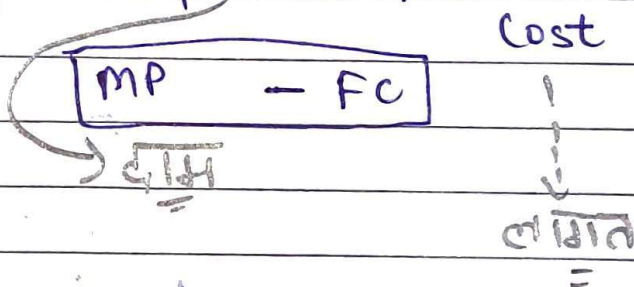
Net factor Income from Abroad

$$= ₹240 - ₹180$$

$$= ₹60$$

### ⑥ Net Indirect Taxes

$$NIT = \text{Market Price} - \text{Factor Cost}$$



\* Net Indirect Tax = Indirect (-) Subsidy Tax

\*  $GDP_{MP} - (-) NIT = GDP_{FC}$

\*  $GDP_{FC} + (+) NIT = GDP_{MP}$



$NDP_{FC} =$  Compensation of Employees (+)

Operating Surplus (+)

Mixed Income of self employed.

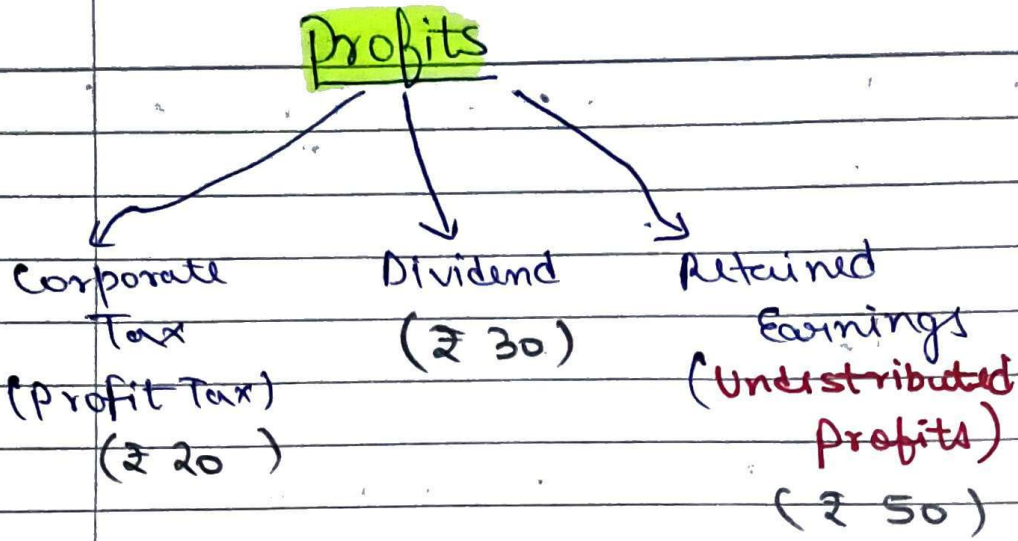
\* COE - Wages & Salaries in cash  
" " in kind

Employers Contribution to Social Security Scheme.

↳ Provident fund

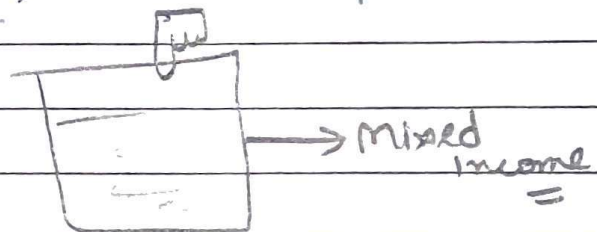
\* operating Surplus - Income from property & Ent's entrepreneurship

Rent + Royalty + Interest + profits



\* **Mixed Income of self Employed** = Rent + Interest + wages + profit

MIXER GRINDER



⑧ National Income ( $NNP_{fc}$ )

$\swarrow$  Net       $\downarrow$  National product       $\searrow$  factor cost

= Domestic Income (+) NFIA  
 i.e.,  $NDP_{fc}$  (+) NFIA.



# 9) Per Capita Income

Real wald: GDP

$$= \frac{\text{GDP (Adjusted by Inflation)}}{\text{Total population.}}$$

\* It is an Indicator of Standard of Living of Country.

## 10, 11, 12) private Income, Personal Income and disposable Income.

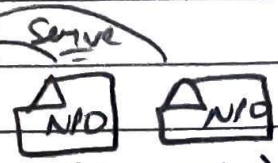
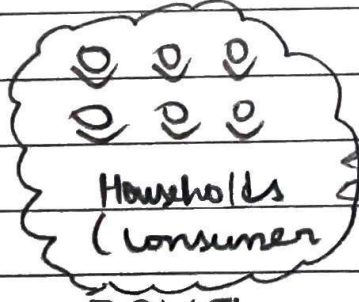
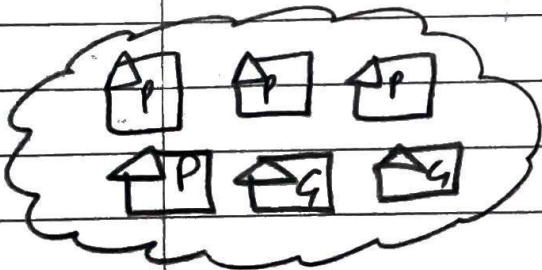
private Income :- Income accrue to private Sector from all sources within & outside Country.

personal Income :- Income of Household Sectors (including NPOs serving households)

Income

factor Income (+) → Received against factor services (Rent, wages, interest & profit)

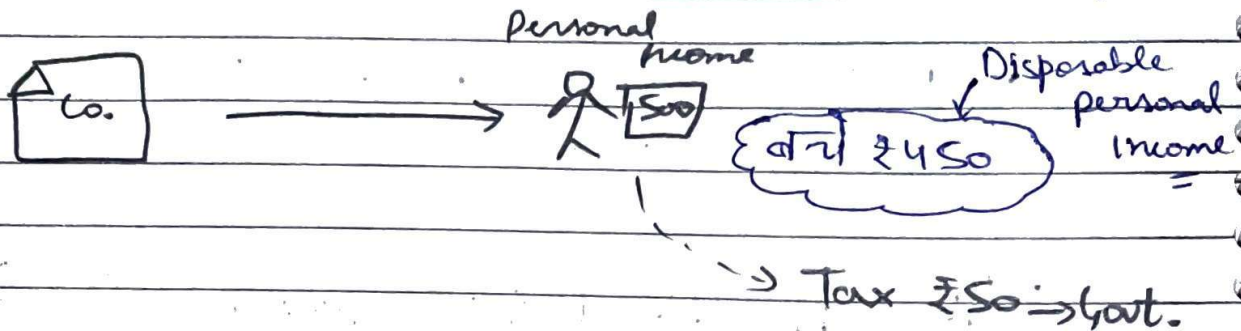
Transfer Income → Unilateral Income (Gifts, Donations, remittance, old age pension)



DOMS

\_/\_/\_

Disposable Personal Income = Amount of money in hands of individuals that is available for consumption or savings.



## \* Flowchart

① Income from Domestic product accruing to private sector = NDP<sub>fc</sub>  
 (i.e., NDP<sub>fc</sub> accruing to private sector)

↳ Surplus of Government Sector.

↳ Income from Property & Entrepreneurship

↳ Savings of Non-

Departmental Undertakings

(B) private Income :- = NDP<sub>FC</sub> accruing to private Sector

- (+) NFIA
- (+) Net current transfers from ROW & Govt.
- (+) National Debt Interest.

(C) personal Income :- private Income

- (-) Undistributed profits (i.e., Retained Earnings)
- (-) Corporate Taxes (i.e., Profit Tax)

\* personal Income = National Income

- (+) Income received but not earned
- (-) Income earned but not received

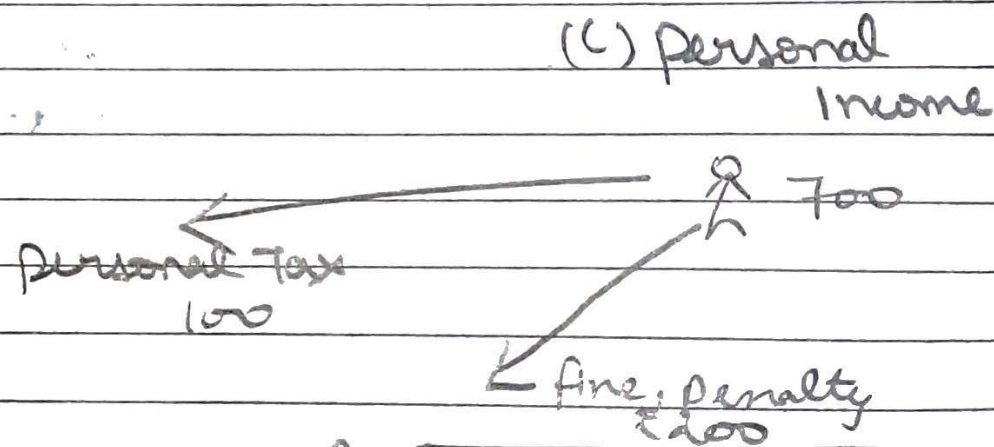
\* personal Income = National Income (-) Undistributed Profits (-) Corporate Tax (-) Net Interest payments by Households (+) Transfer payments to households from firms & Govt.

(D) Disposable Personal Income = Personal Income  
 (-) Personal Taxes  
 (-) Non Tax payments (like fines, penalties)

\* GNDI =  $GNP_{mp}$  (+) Net Current transfers from ROW.  
 (Gross National Disposable Income)

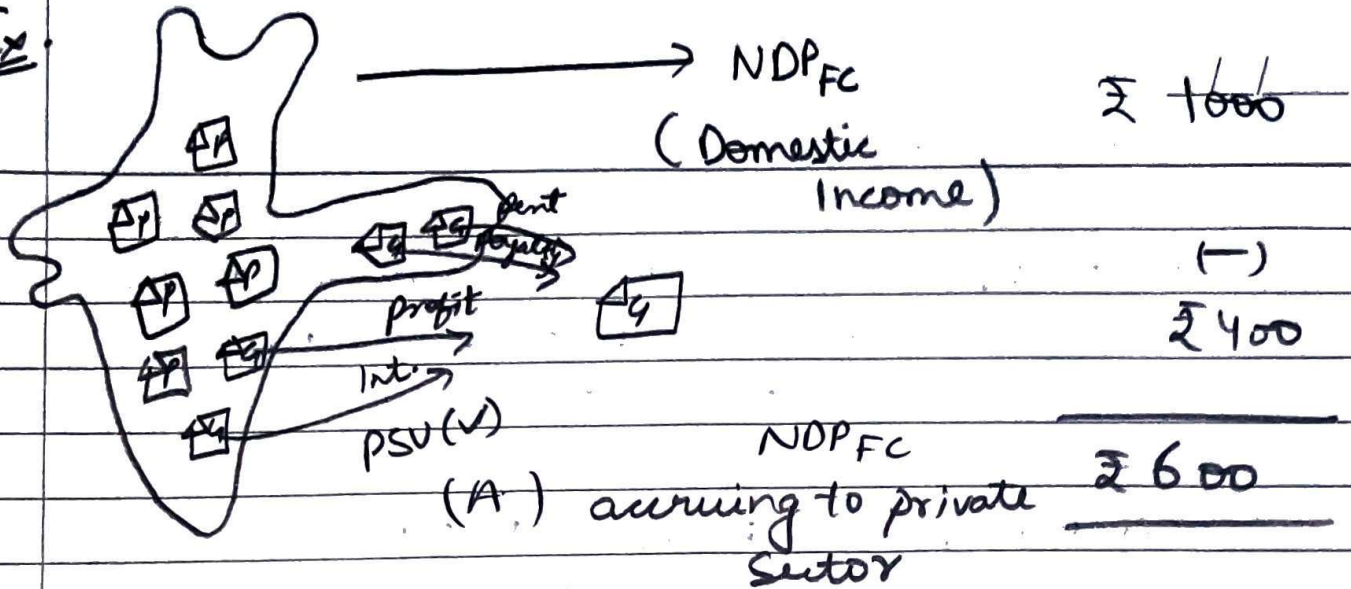
\* NNDI =  $NNP_{mp}$  (+) Net Current transfers from ROW.  
 (Net National Disposable Income)

GNDI (-) Depreciation.



(D) Disposable Personal Income = 400

Ex.



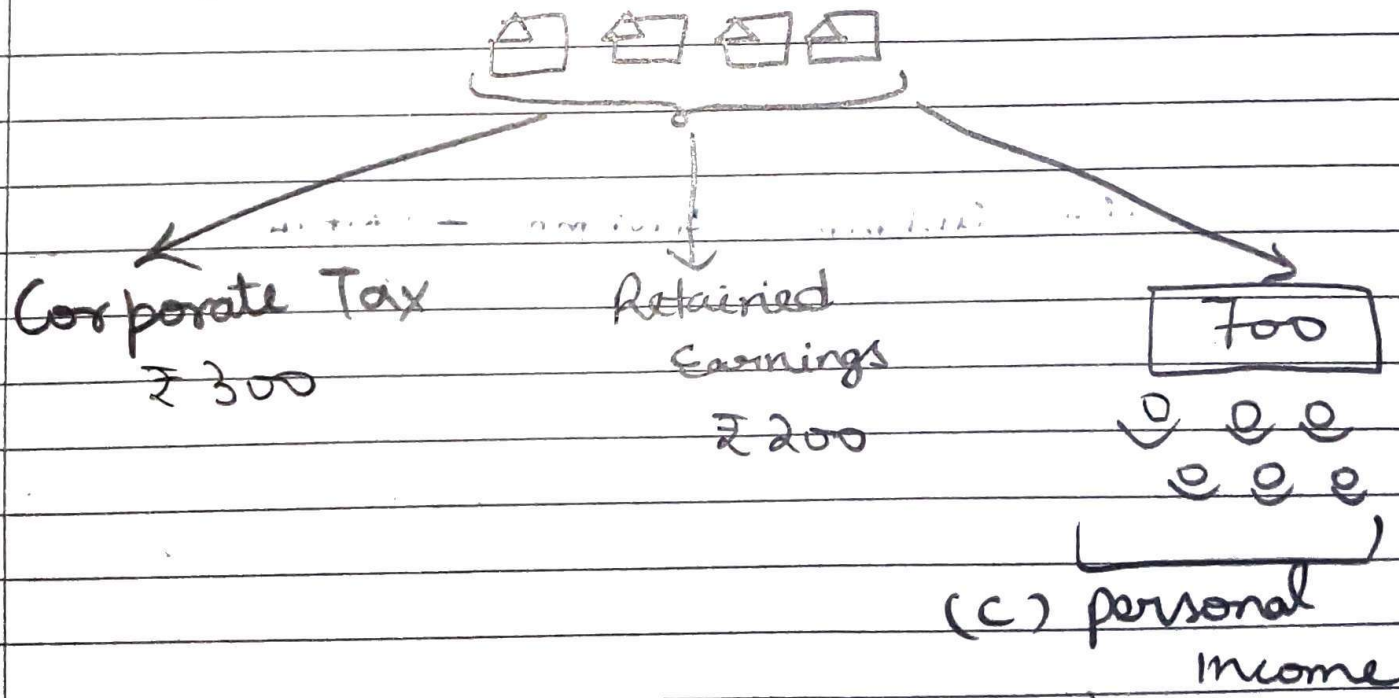
AP AP AP AP AP = 600  
 (NDP<sub>FC</sub> accruing to private sector)

NFIA (विदेश) 100

Net Current Transfers (Govt. & Row) (free) 200

National Debt Interest (if any) 300

(B) Private Income 1200



## Illustration 5

$$\begin{aligned} \text{(a) } \text{NDP}_{fc} &= \text{COE} + \text{OS} + \text{Mixed Income} \\ &= 1000 + 2000 + 1100 \\ &= 4100 \end{aligned}$$

$$\begin{aligned} \text{(b) } \text{NNP}_{fc} &= \text{NDP}_{fc} + \text{NFIA} \\ &= 4100 + (-50) \\ &= 4050 \text{ Crores} \end{aligned}$$

$$\begin{aligned} \text{(c) } \text{NNP}_{mp} &= \text{NNP}_{fc} + \text{NIT} \\ &= 4050 + 450 \\ &= 4500 \text{ Crores} \end{aligned}$$

$$\begin{aligned} \text{(d) } \text{GNP}_{mp} &= \text{NNP}_{mp} + \text{Depreciation} \\ &= 4500 + 400 \\ &= 4900 \text{ Crores} \end{aligned}$$

$$\begin{aligned} \text{(e) } \text{GDP}_{mp} &= \text{GNP}_{mp} - \text{NFIA} \\ &= 4900 - (-50) \\ &= 4950 \text{ Crores} \end{aligned}$$

# \* Measurement of National Income (V.I.M.P.)

(I)

## Circular flow of Income.

Production  
phase



firms produce  
Goods & Services with  
help of factor services.

Income  
(Distribution)

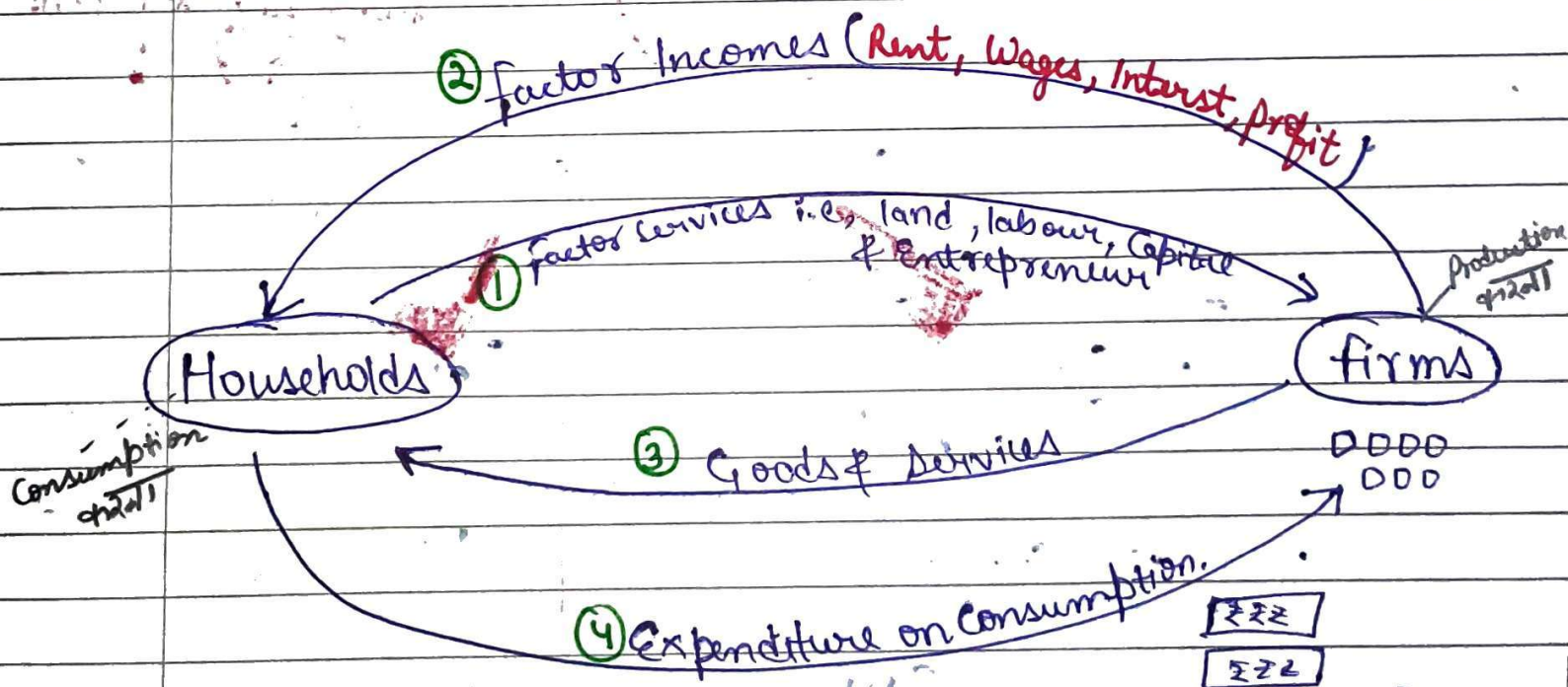
phase

Flow of factor incomes  
from firms to households.

Expenditure  
(Disposition)

phase

Income is spent  
on consumption.



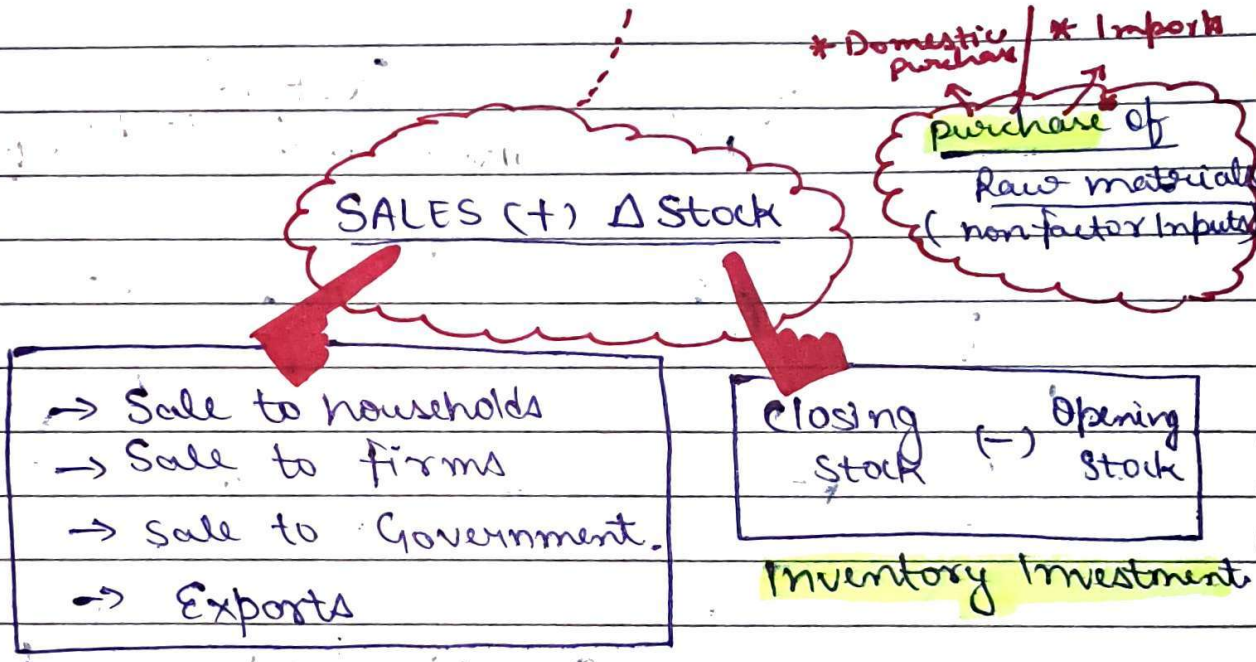
II **production Method** (or Value added method)

→ Identify the producing Enterprises into three Sectors.

- primary sector
- Secondary sector
- Tertiary Sector.

→ Calculate **GVA<sub>mp</sub>** of Each Sector.

Gross value added at MP = Value of output - Intermediate Consumption.

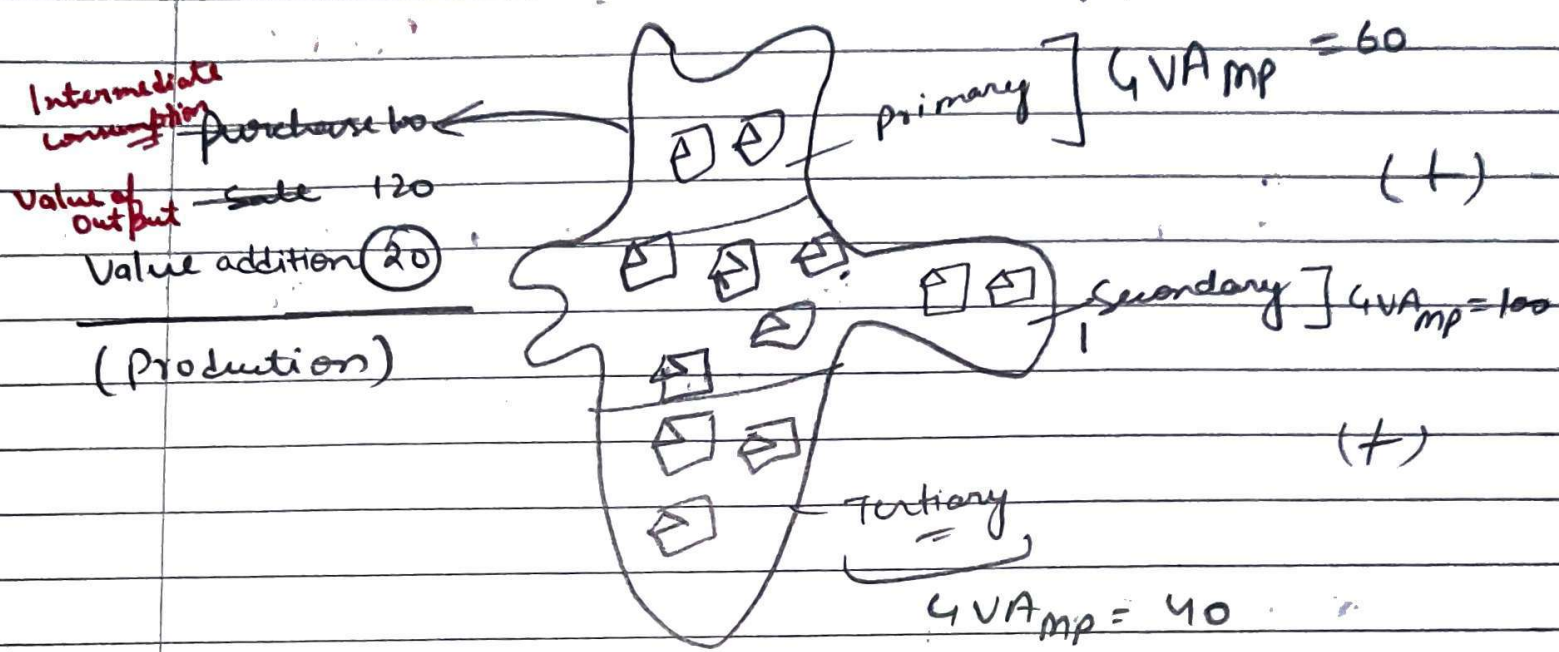


→ Calculate **GDP<sub>mp</sub>** =  $\sum$  GVA<sub>mp</sub>

→ National Income = GDP<sub>mp</sub> (-) Dep (+) NFIA (-) NIT  
(**NNP<sub>fc</sub>**)



\* Production for self consumption, imputed rent,  
Own account production of fixed assets are  
 Included in Value of Output.



$GVA_{mp} = 200$

### III Income Method

→ Domestic Income = Compensation (+) operating  
 of Employees Surplus  
 (+) Mixed Income of self  
 - Employed.

→  $NNP_{fe} = \text{Domestic Income (+) NFIA}$   
 $NDP_{fe}$

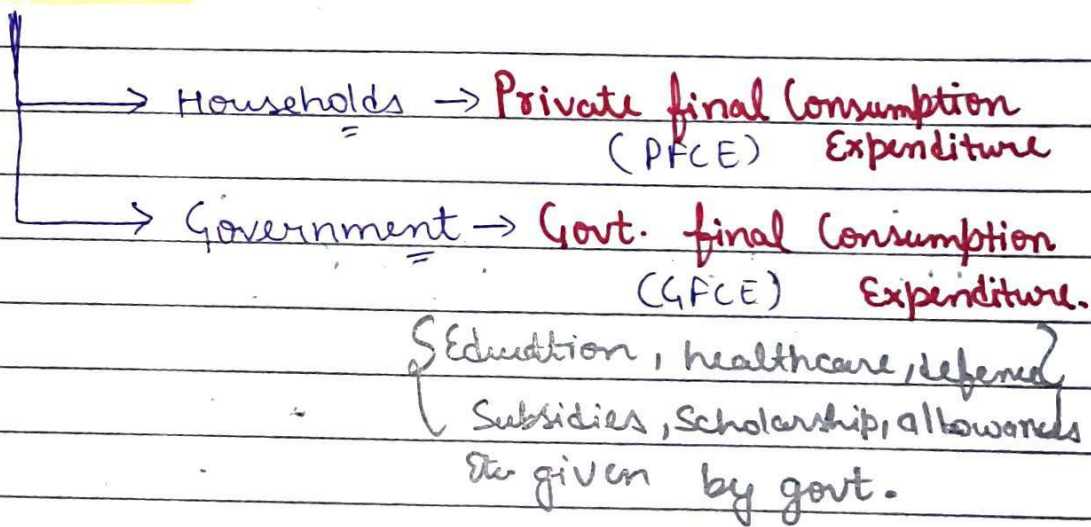
IV

# Expenditure Method (Income Disposal Approach)

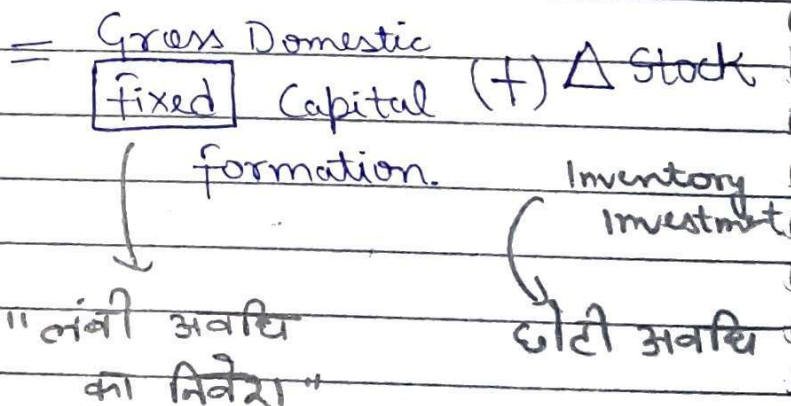
'खर्च'

$$\rightarrow GDP_{mp} = \text{final Consumption Expenditure} (+) \text{Gross Domestic Capital formation} (+) \text{Net Exports.}$$

## \* Final Consumption Expenditure.



## \* Gross Domestic Capital formation. [Gross Investment]



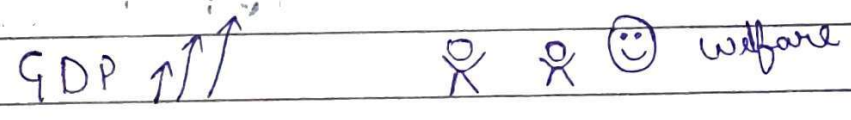
\* Net Exports = Exports (-) Imports.

→ National Income = GDP<sub>mp</sub> (-) Dep. (+) NFIA (-) NIT (NNP<sub>fc</sub>)

\* System of Regional Accounts in India.

→ Regional Accounts provide Integrated database on the numerous transactions taking place in the regional Economy. At present, all states & Union territories of India compute State Income Estimates and district level Estimates. State Income or Net State Domestic product (NSDP) is measured by the State.

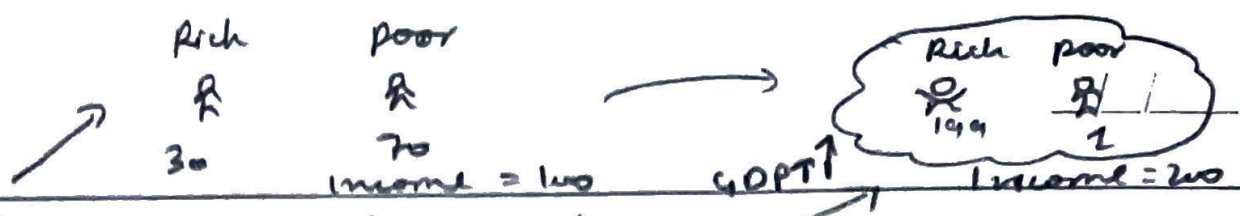
\* GDP and Welfare



IS IT TRUE ???

No

→ GDP measure Excludes some of the following points:



- Distribution of Income
- Quality Improvements in technology
- Illegal transactions (Drugs, Gambling)
- Non market production (Education level, health level)
- ↳ **Disutility** of loss of leisure time. (cost in time)
- Economic "Bads" (Crime, pollution, traffic)
- positive & Negative Externalities.

## \* Limitation & Challenges of National Income Computation.

- |   |  |
|---|--|
| * Lack of agreed definition of national income                  | * Inadequacy of data   |
| * Accurate Distinction between final & Intermediate Expenditure | * presence of Non-monitized Sector.                                |
| * Transfer payments (Transfer Income)                           | * absence of <u>recording</u> of Income due to <u>illiteracy</u> . |
| * difficulty of Incorporating <u>distribution</u> of Income.    | * lack of adequate of estimate of <u>"depreciation"</u>            |
| * value of govt. <u>services</u> .                              |  |

# Unit-2 The Keynesian Theory of Determination of National Income

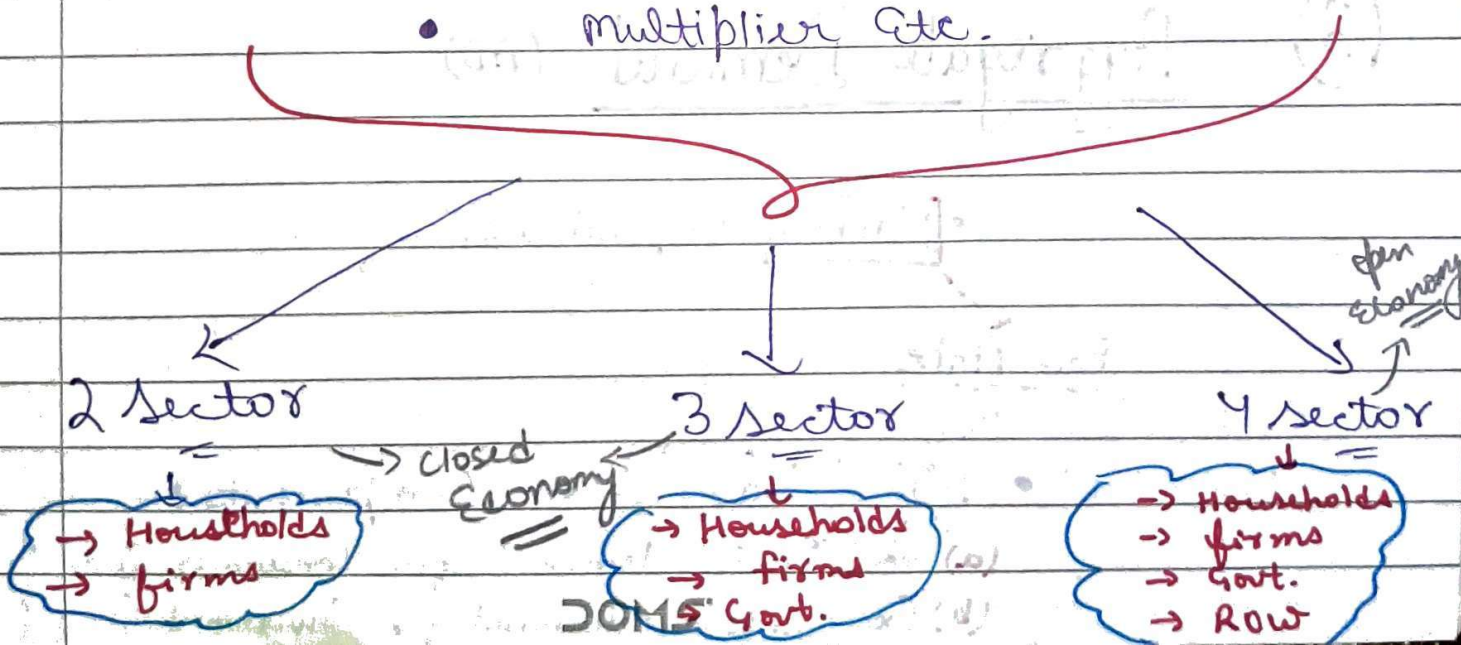
## ① Introduction



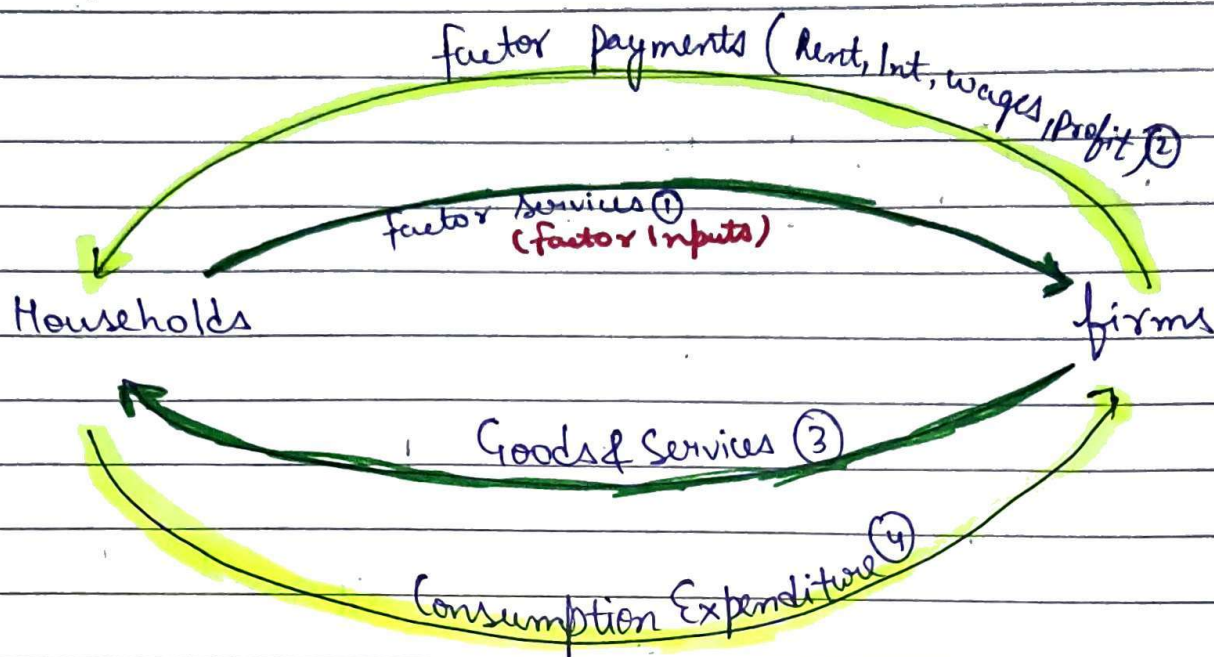
1930 :- The Great Depression.

1936 :- John Maynard Keynes's General Theory of Employment, Interest & Money was published.

- Consumption & Income Relation.
- Savings
- Multiplier etc.



## ② Circular flow (2 sector)



■ Real flow (1, 3)

■ Money flow (2, 4)

\* factor payments = value of output \*

## ③ Aggregate Demand (AD)

• planned Expenditure.  
↙  
Ex. Ante

• AD has two components :-

- (a) Ex-ante demand for Consumer Goods (C)
- (b) Ex-ante ~~DOM~~ demand for Investment Goods (I)

$$\therefore AD = C + I$$

Constant Investment

Short-Run Study

### 3(a) Consumption function.

$$C = f(y)$$

C is function of Income.

"अवधि" depends on "अर्थ"

$$C = a + by$$

a = autonomous consumption.

b = Slope of consumption curve.

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

Consumption

a

Slope = b

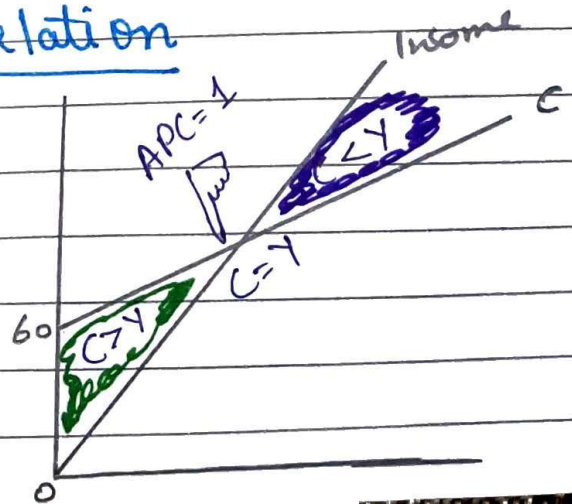
Income (output)

Marginal propensity to consume (MPC)

### Consumption & Income relation

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

Income	Consumption	APC
0	60	$60 \div 0 = NA$
100	140	1.4
200	220	1.1
300	300	1
400	380	0.95
500	460	0.92



# Consumption, Income & Savings Relation

$$\text{Savings} = f(y)$$

Savings is function of Income

Income (Y)	Consumption (C)	Savings (S)
0	60	-60
100	140	-40
200	220	-20
<b>BEP</b> 300	300	0
400	380	20
500	460	40

$$\text{Savings (S)} = Y - C$$

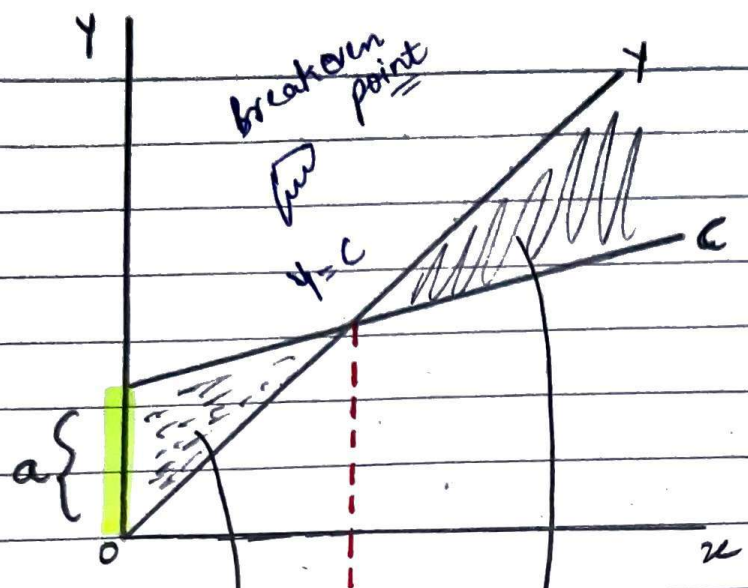
$$\text{MPS} = \text{Slope of Savings line} = \frac{\Delta S}{\Delta Y}$$

(Marginal prop. to Save)

$$\text{APS} = \frac{S}{Y}$$

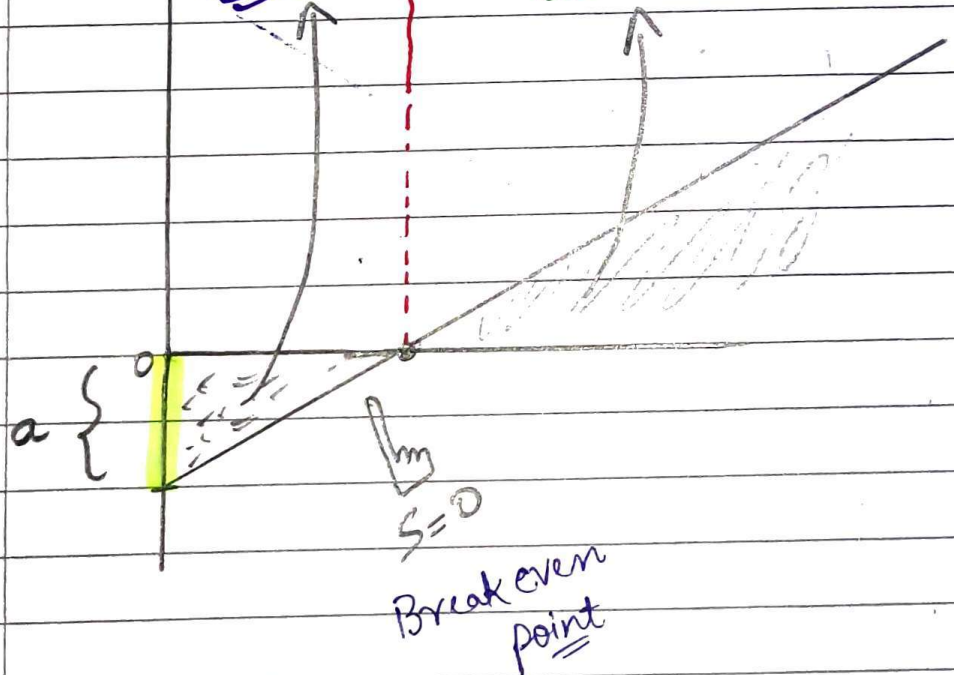
(Avg. propensity to Save)





Dissavings

Savings



④

# Aggregate Supply (AS)

→ AS represents Income i.e.  $Y$

→ Its two components are :-

(i) Consumption ( $C$ )

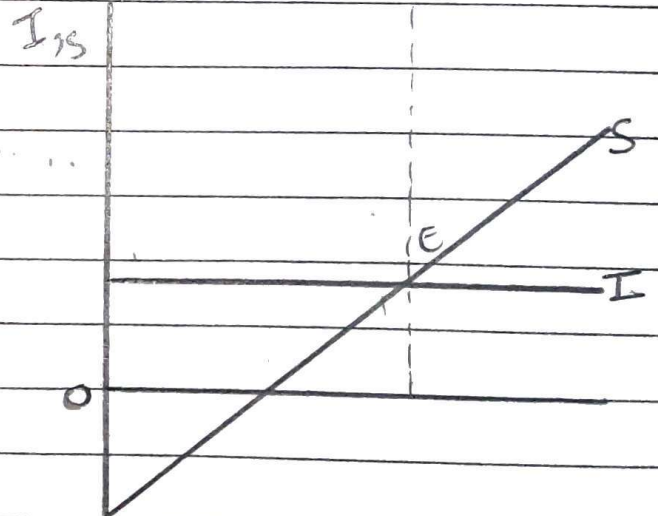
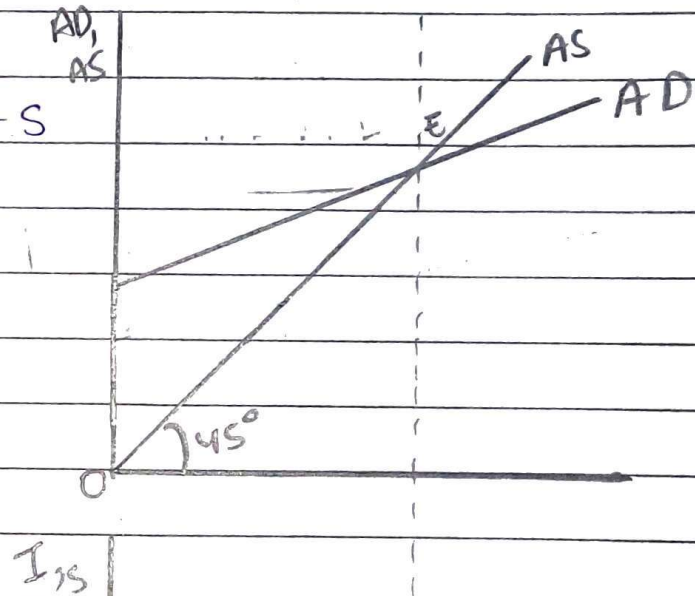
(ii) Savings ( $S$ )

$$Y = C + S$$

## \* National Income Determination (2 Sector)

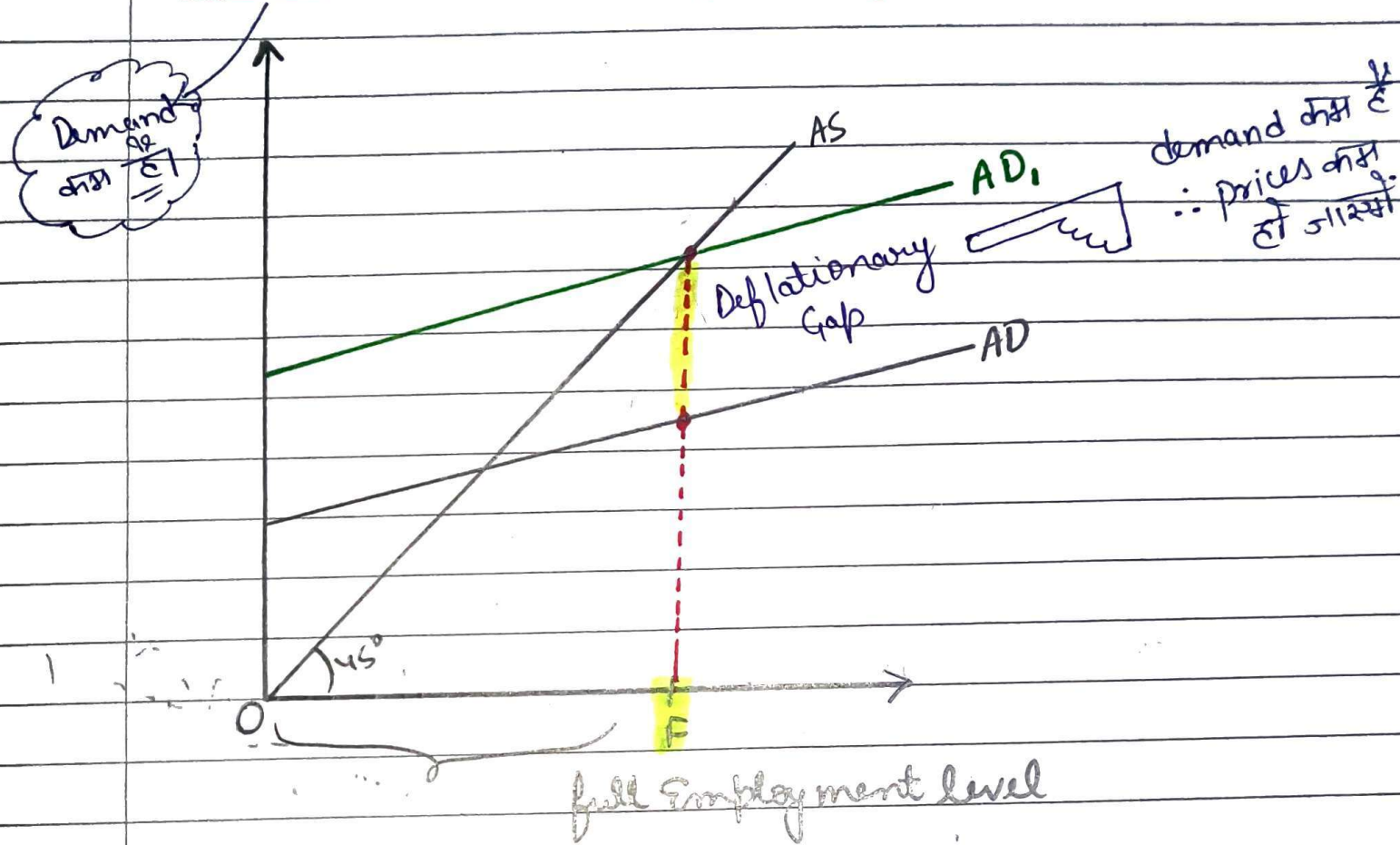
$$\begin{aligned} AD &= AS \\ C + I &= C + S \\ I &= S \end{aligned}$$

Expected  
Value (AS)  
= Realised  
Value (AD)

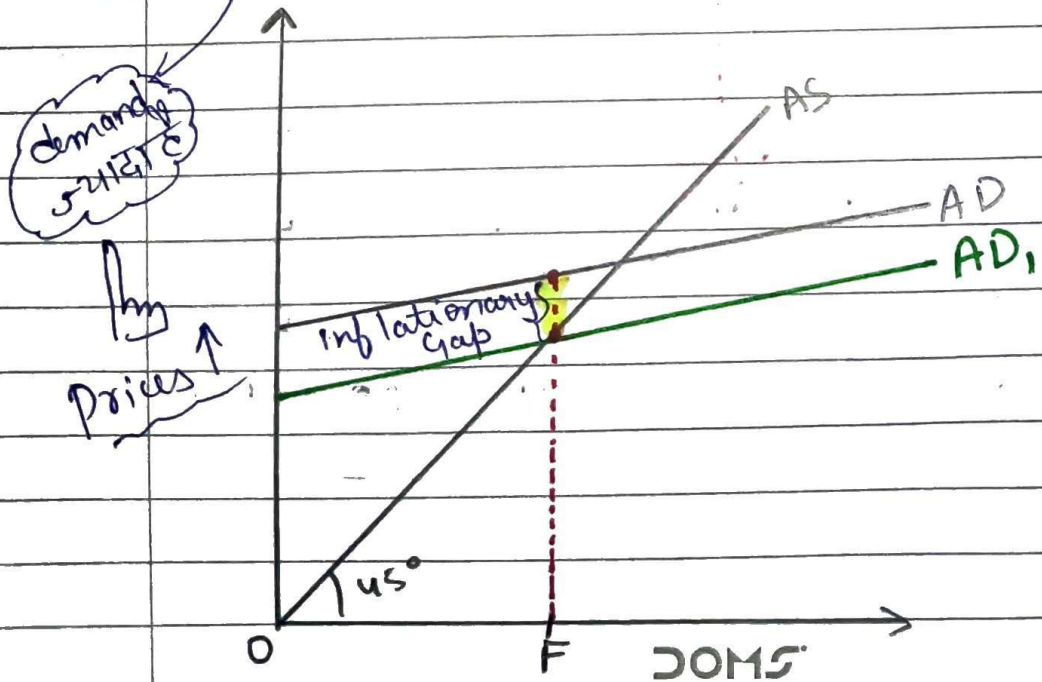


\* Equilibrium with Unemployment or Inflation.

(a) Deficient demand (Deflationary Gap)



(b) Excess demand (Inflationary Gap)

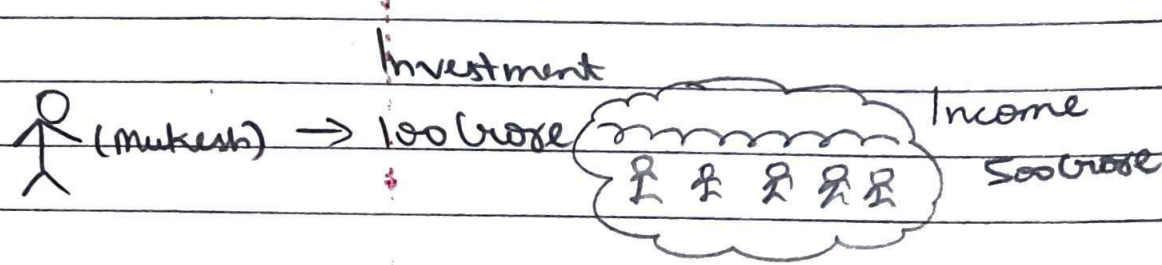


5

# \* Investment Multiplier \*

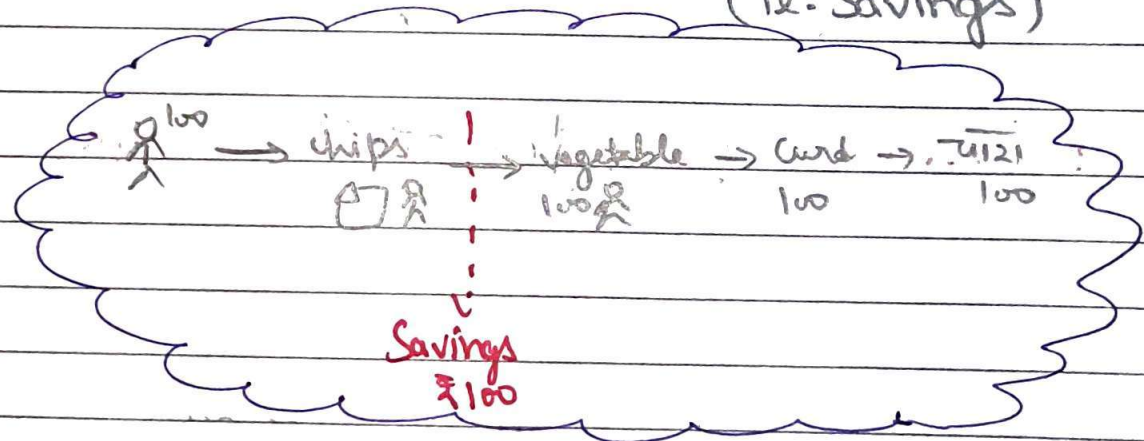
→ It shows the responsiveness of change in Investment on change in Income.

i.e. 
$$K = \frac{\Delta Y}{\Delta I}$$
← change in income  
← change in Investment



Multiplier = 5 times.

→ This process stop due to **LEAKAGES** (i.e. Savings)



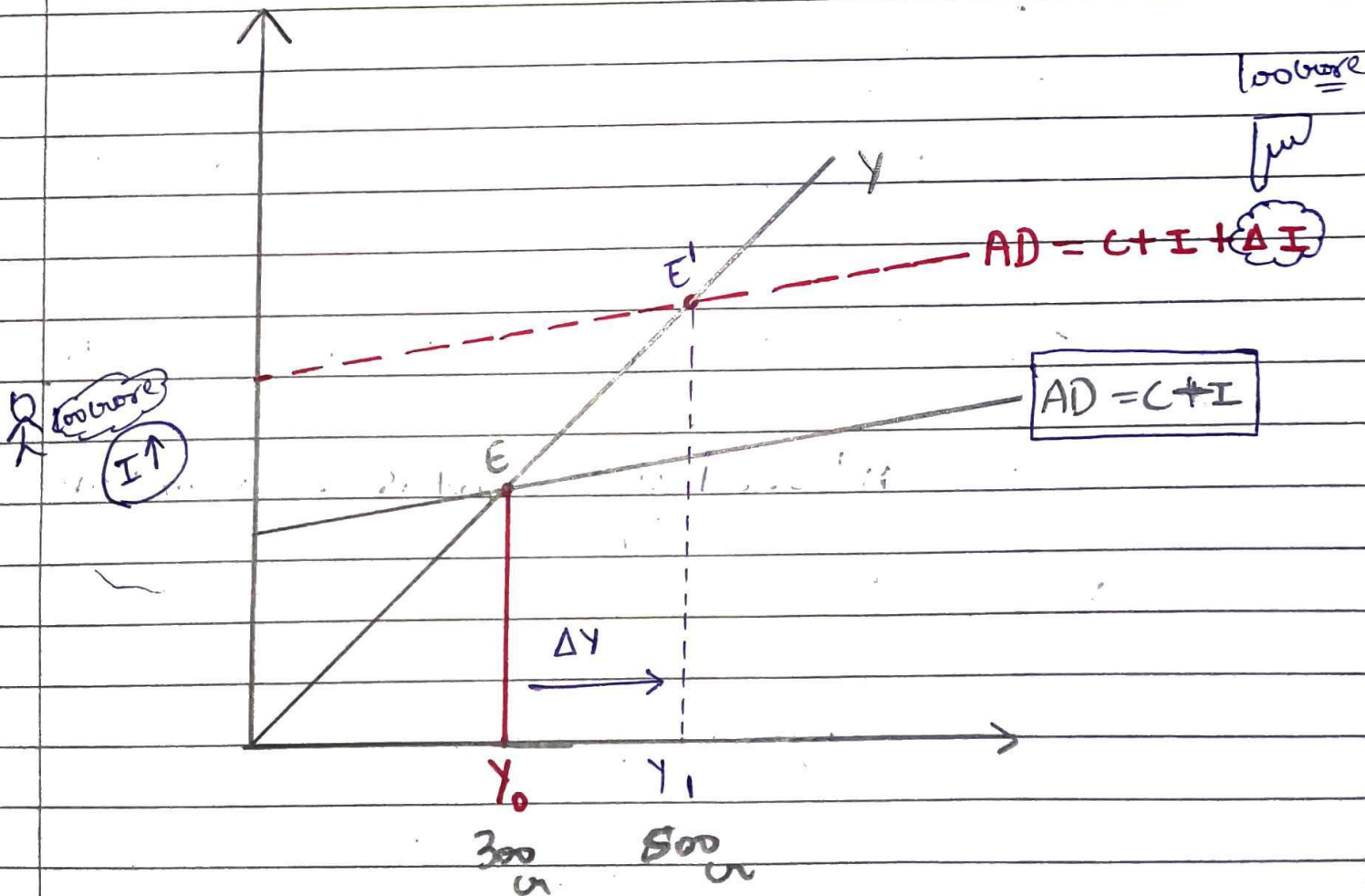
→ 
$$K = \frac{1}{1 - MPC}$$
 or 
$$\frac{1}{MPS}$$

MPC	K
0	1
0.2	1.25
0.5	2
0.8	5

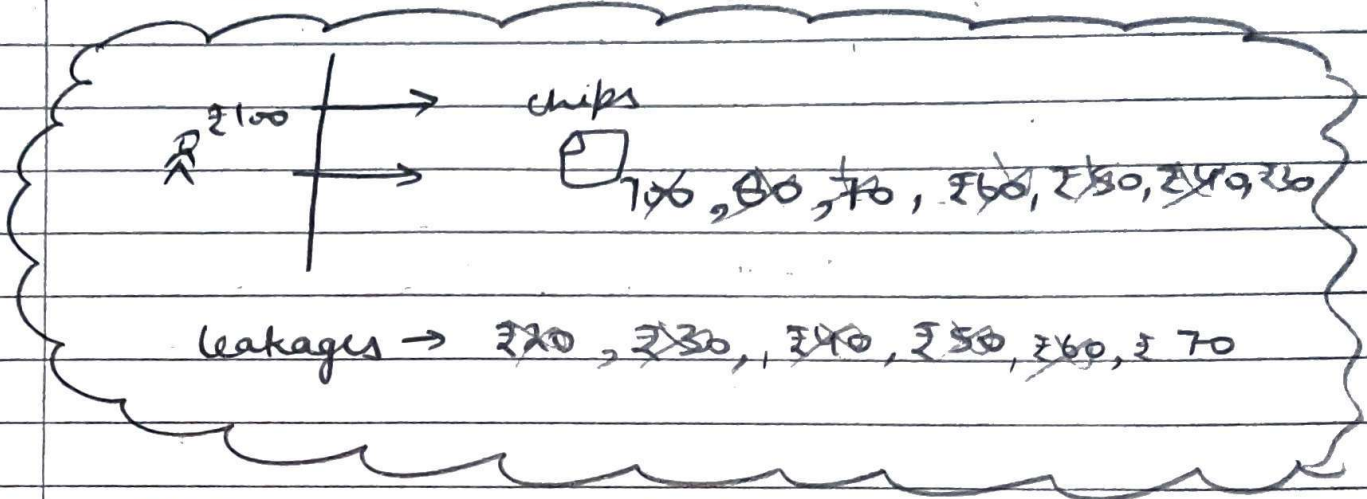
MPS	$\frac{K}{I}$
0.2	5
0.5	2
0.8	1.25
1	1

MPC  $\uparrow$  K  $\uparrow$   
Direct Relation.

MPS  $\uparrow$  K  $\downarrow$   
Inverse Relation.



→ More powerful these leakages are, the smaller the value of multiplier.



\* leakages are caused due to :-

- ① ↑ in Taxes
- ② ↓ in MPC ← "बचत करने की इच्छा" (Saving ↑)
- ③ ↑ in Demand of Consumer goods.
- ④ Undistributed profits of Companies.

\* Underdeveloped Countries

MPC is High

k is low

Why??

① Due to

Structural Inadequacies.

↑ in Consumption  
 but ↑ in production (Not possible)  
 rather Prices (↑)

# \* Determination of Equilibrium Income - ③

Sector

$$AS = AD$$

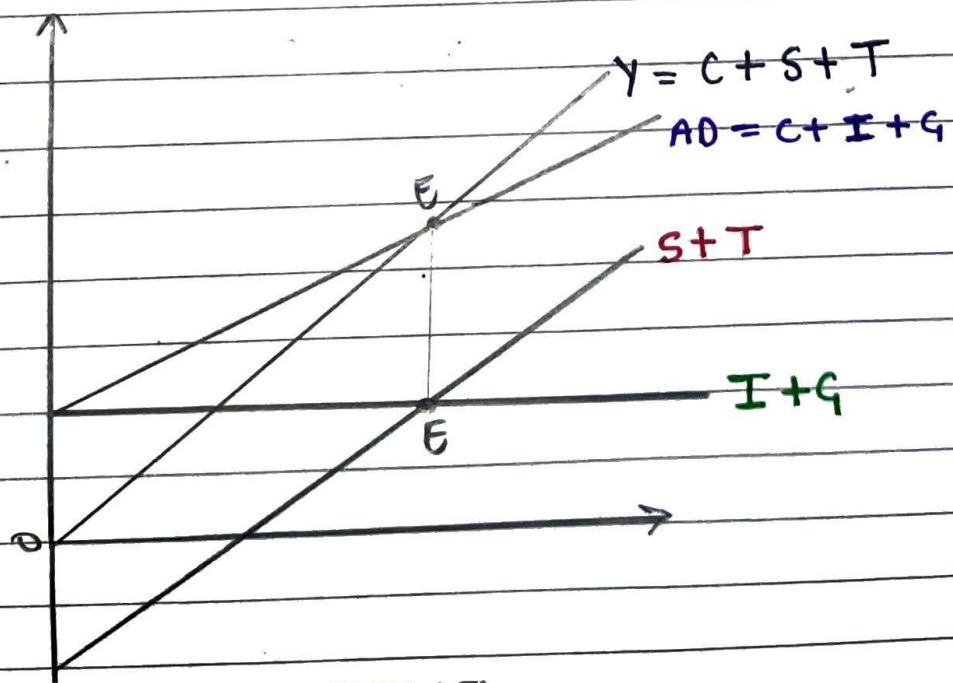
$$Y = AD$$

Taxes i.e.,  
Govt. Income

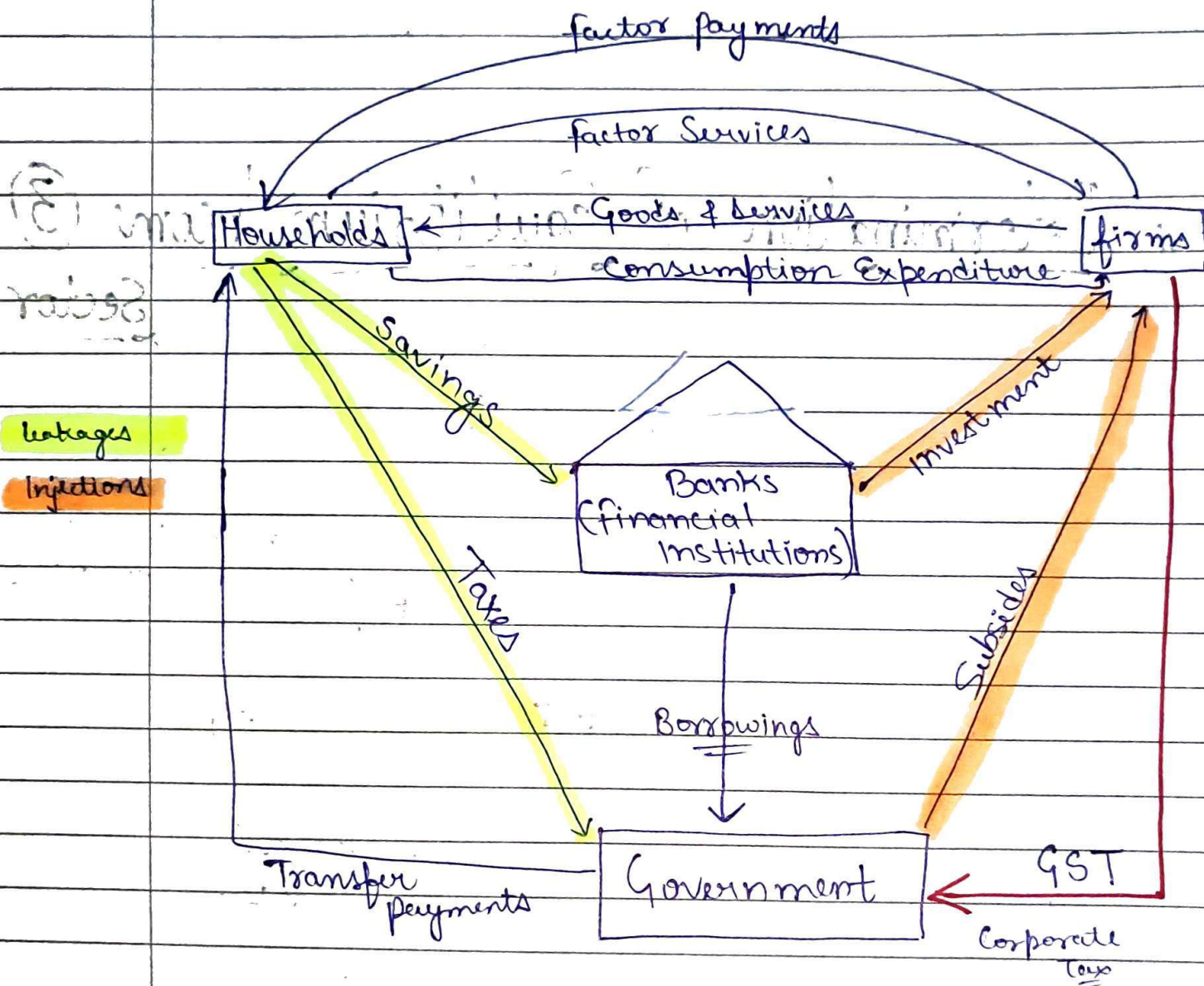
$$Y = C + I + G$$

Government Expenditure

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



# Circular flow of Income - 3 Sector





# Formulae

①  $Y = C + I + G$  (Equilibrium Condition)

here  $C = a + bY_d$

\*  $Y_d = Y - T$  -----> lumpsum Tax

disposable income

$Y = a + bY_d + I + G$

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

$Y = a + bY - bT + I + G$

$Y - bY = a - bT + I + G$

$Y(1 - b) = a - bT + I + G$

②  $Y = \frac{1}{(1 - b)} [a - bT + I + G]$

② When  $Y_d = Y - T (+) TR$

autonomous transfer payment

then,

$$AS = AD$$

$$Y = C + I + G$$

$$Y = [a + by_d] + I + G$$

$$Y = a + b(Y - T + TR) + I + G$$

$$Y = a + bY - bT + bTR + I + G$$

$$Y - bY = a + bTR - bT + I + G$$

$$Y(1 - b) = a + bTR - bT + I + G$$

②

$$Y = \frac{1}{(1 - b)} [a + bTR - bT + I + G]$$

③

When Tax is function of Income.

$$T = \bar{T} + ty$$

Total Tax ←  $\bar{T}$  Autonomous fixed Tax ↓  $ty$  Income Tax Rate →

Now

$$AS = AD$$

$$Y = C + I + G$$

$$Y = a + by_d + I + G$$

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

$$Y = a + b \{ Y - (\bar{T} + ty) \} + I + G$$

$$Y = a + b [ Y - \bar{T} - ty ] + I + G$$

$$Y = a + bY - b\bar{T} - bty + I + G$$

$$Y - bY + bty = a - b\bar{T} + I + G$$

$$Y(1 - b + bt) = a - b\bar{T} + I + G$$

Ⓚ

$$Y = \frac{1}{1 - b + bt} [ a - b\bar{T} + I + G ]$$

$\frac{1}{(1 - b + bt)}$  is known as <sup>x</sup> Tax Multiplier<sup>x</sup>

④ When  $C = a + bY_d$

here  $Y_d = Y - T + TR$

$$Y_d = Y - (\bar{T} + ty) + TR$$

$$Y_d = Y - \bar{T} - ty + TR$$

$$AS = Ad$$

$$Y = C + I + G$$

$$Y = a + bY_d + I + G$$

$$Y = a + b[Y - \bar{T} - ty + TR] + I + G$$

$$Y = a + bY - b\bar{T} - bty + bTR + I + G$$

$$Y - bY + bty = a - b\bar{T} + bTR + I + G$$

$$Y(1 - b + bt) = a - b\bar{T} + bTR + I + G$$

R

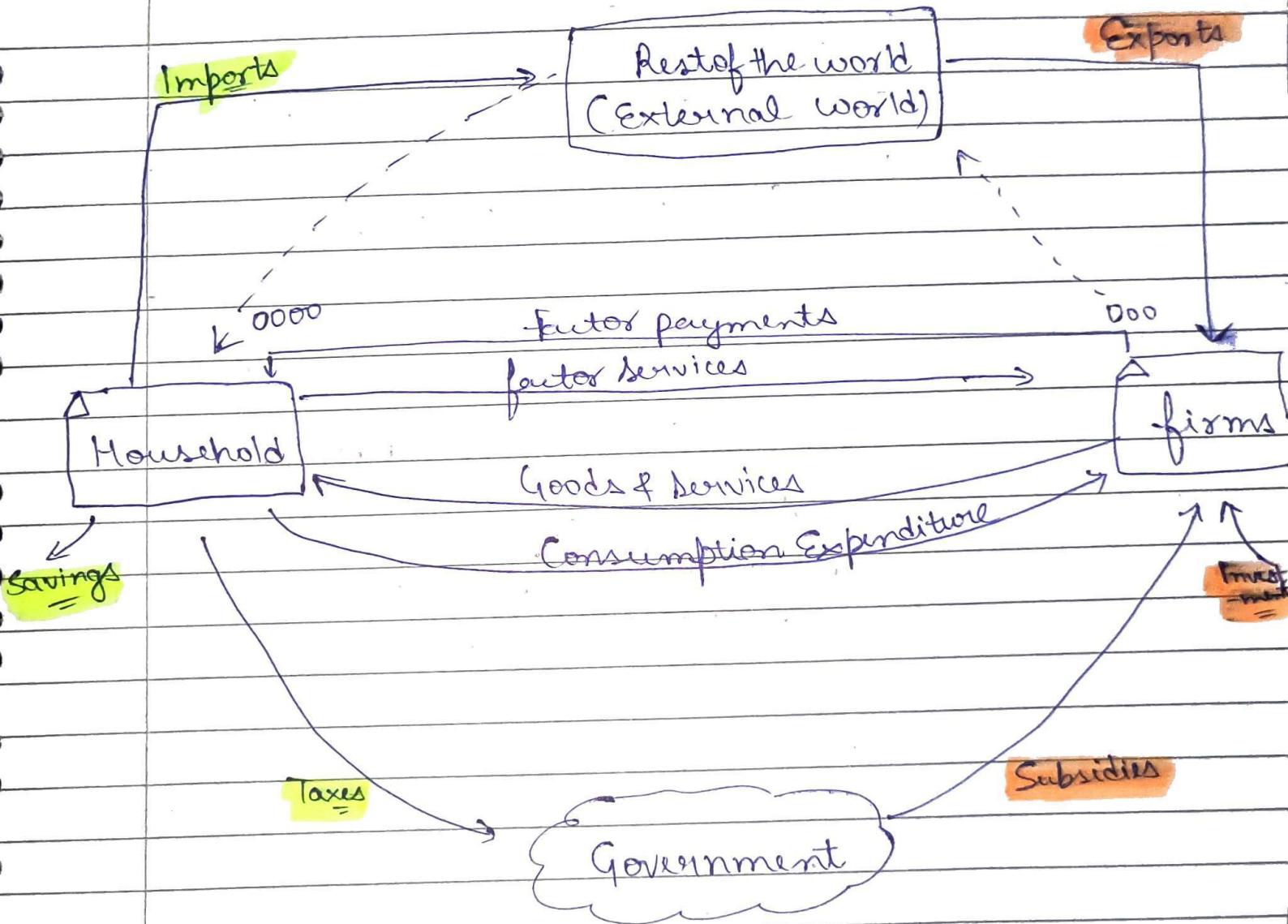
$$Y = \frac{1}{(1 - b + bt)} [a - b\bar{T} + bTR + I + G]$$



# Determination of Equilibrium Income

4 Sectors.

## ① Circular flow



leakages

injections

# Equilibrium

$$AS = AD$$

w/ no gov't

$$Y = AD$$

$$\therefore C + S + T = C + I + G + (X - m)$$

net exports

$$C + S + T + m = C + I + G + X$$

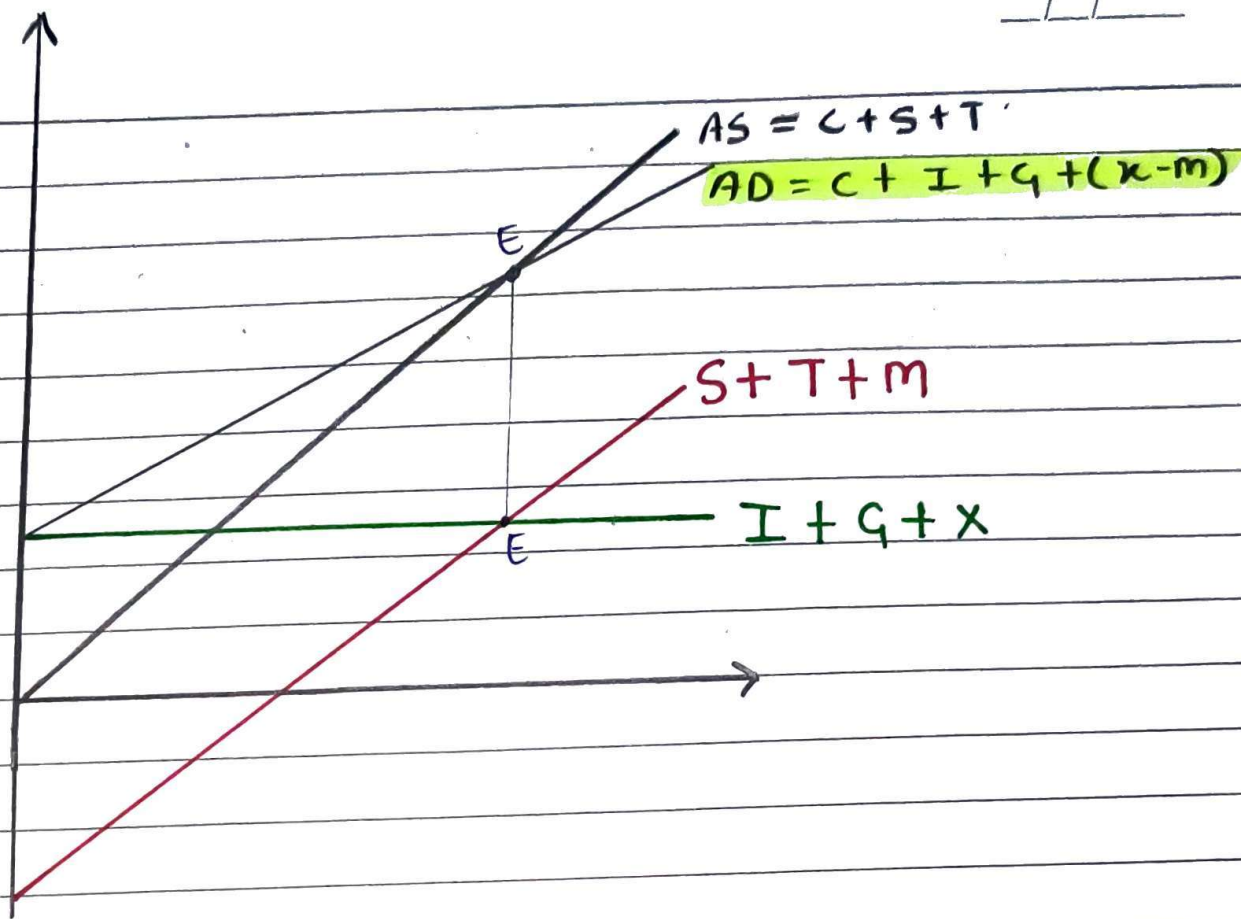
$$S + T + m = I + G + X$$

$m = \bar{m} + mY$  → Income.

Autonomous Imports

Propensity to Imports

$$m = \frac{\Delta m}{\Delta Y}$$



At Equilibrium

$$AS = AD$$

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

$$C = a + bY_d$$

here,  $Y_d = Y - T$

$$M = \bar{m} + mY$$

$$Y = a + bY_d + I + G + X - [\bar{m} + mY]$$

$$Y = a + b(Y - T) + I + G + X - [\bar{m} + mY]$$

$$Y = a + bY - bT + I + G + X - \bar{m} + mY$$

$$+mY + Y - bY = a - bT + I + G + X - \bar{m} + mY$$

$$Y(1-b) = a - bT + I + G + X - \bar{m}$$

$$\textcircled{R} \quad Y = \frac{1}{1-b+m} [a - bT + I + G + X - \bar{m}]$$

foreign Trade multiplier.

$$* \quad \text{foreign Trade multiplier} = \frac{1}{(1-b+m)} = \frac{\Delta Y}{\Delta X}$$

*Income* ↑  
↓  
*Exports*

\* If Exports is less than Imports then National Income *decreases*.

\* if  $m \uparrow$  then foreign Trade Multiplier *decreases*.

$$FTM = \frac{1}{1-b+m}$$

$$= \frac{1}{1-2+4} = \frac{1}{3} = 0.3\bar{3}$$

New  $m=6$

$$FTM = \frac{1}{1-2+6} = \frac{1}{5} = 0.2$$