

Chapter-6

National Income

* Unit-1

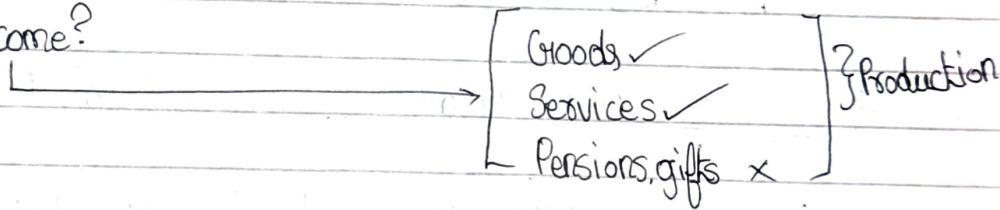
- Aggregators [Concepts]
- Circular Flow
- Measurements of N.I

Income Method → ΣM

Value Added Method → VAM

Expenditure Method → EM

* Income?



$$\boxed{\text{Income} = \text{Product}}$$

*

Rest of World

India	
$\Sigma E \Sigma (a)$	$\Sigma E A (c)$
	$F E A (d)$
$F E I (b)$	

$$\star \text{ Domestic Product} = a + b$$

$$\text{National Product} = a + c$$

$$(a + b) + (c - b) = (a + c)$$

$$\boxed{DP + NFIA = NP}$$

Net Factor Income

Net factor Income
from abroad
[$c > b$]

Net factor Income
to abroad
[$c < b$]

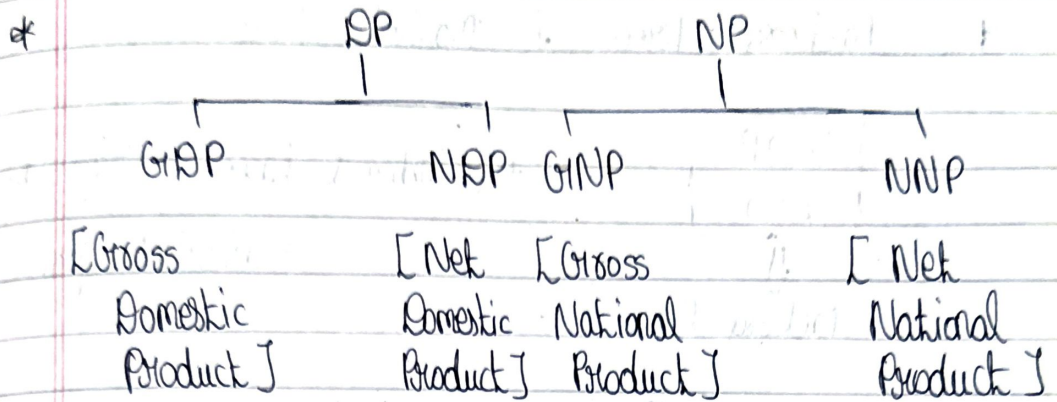
$\star$ Domestic Product

It is the aggregate value of all final goods and services produced within the domestic boundaries of a country in a particular period.

National Product

It is the aggregate value of all final goods and services produced by normal residents of a country in a particular period.

$$\boxed{DP + NFIA = NP}$$



* $\Rightarrow$ Gross - Depreciation = Net
 $\Downarrow$ Also called
 Capital consumption allowance

* 1) $GDP - \text{Depreciation} = NDP$

2) $NNP + \text{Depreciation} = GNP$

3) $GDP - \text{Depreciation} + NFIA = NNP$

* Gross :- Including depreciation

Net :- Excluding depreciation

$\Rightarrow NNP + \text{Depr} - NFIA = GDP$

* Factory Price & Market Price

$$\begin{array}{ccc} \boxed{\begin{array}{c} \text{COP} \\ \text{£50} \end{array}} & \longrightarrow & + (\text{Indirect taxes} - \text{Subsidy}) \\ \downarrow & & \\ \text{Factory Price} & & = \text{Market price} \end{array}$$

$$\Rightarrow \text{FP} + [\text{IT} - \text{Subsidies}] = \text{MP}$$

$$\Rightarrow \text{FP} + \text{NIT} = \text{MP}$$

$\downarrow$
Net Indirect Taxes

* 1) GDP_{MP} 2) GDP_{FC} 3) NDP_{FC} 4) NDP_{MP}

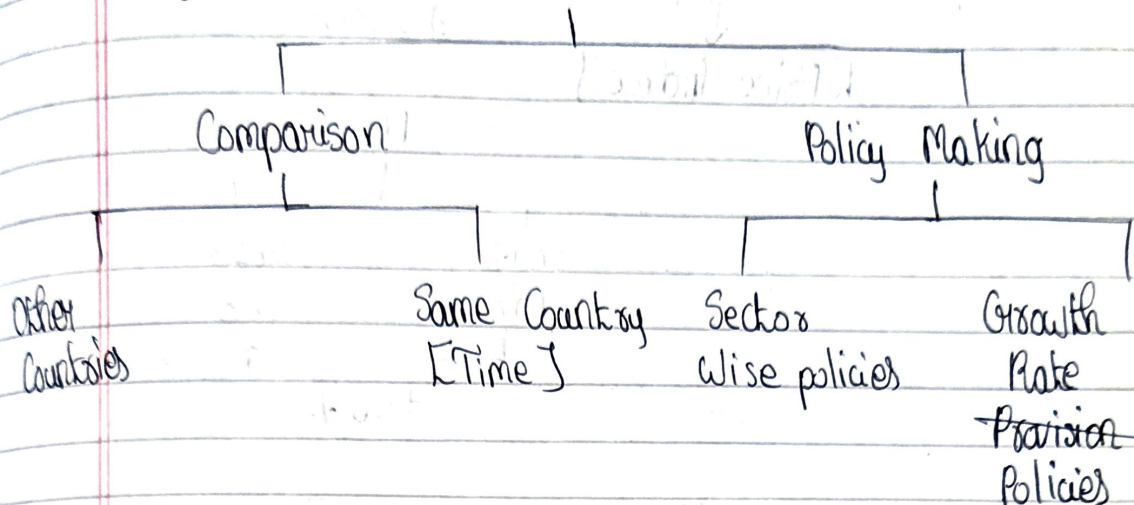
5) GNP_{MP} 6) GNP_{FC} 7) NNP_{MP} 8) NNP_{FC} default

$\text{NNP}_{\text{FC}} = \text{National Income}$

* $\Rightarrow$ If NFIA is positive $\rightarrow \text{NP} > \text{GP}$

$\Rightarrow$ If NFIA is negative $\rightarrow \text{NP} < \text{GP}$

* Why National Income needs to be estimated?



$$* \text{ GDP Deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$$

GDP = Income = Value of Goods & Services

$$= P \times Q$$

$$\text{Nominal GDP [2023]} = \text{C. Year price [2023]} \times \text{C. Year Quantity [2023]}$$

$$\text{Real GDP [2023]} = \text{Base yr price [2018]} \times \text{C. Year Quantity [2023]}$$

2018

2023

$$P = ₹50$$

$$Q = 3,000 \text{ units}$$

$$P = ₹80$$

$$Q = 5,000 \text{ units}$$

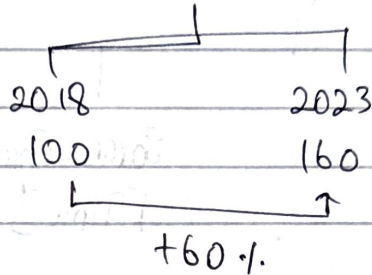
$$N.I \Rightarrow ₹1,50,000$$

$$N.I \Rightarrow \begin{array}{l} \text{Nominal} = ₹4,00,000 \\ \text{Real} = ₹2,50,000 \end{array}$$

$$\text{GDP Deflator} = \frac{4,00,000}{2,50,000} \times 100$$

↓
[Price Index]

$$= 160$$



* $\Rightarrow$ GDP Deflator measures impacts of inflation

$\Rightarrow$ Real GDP estimates impacts of inflation

* 1) $\therefore \text{GDP Deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$

2) Gross - Depon = Net

3) DP + NFIA = NP

4) FP + NIT = MP

National Income Accounting

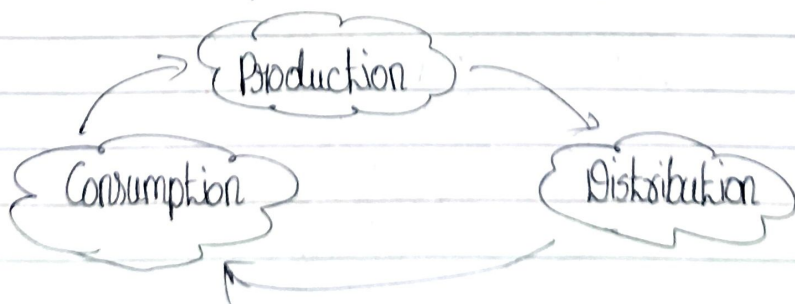
- Who maintains N.I → Our country
- Circular flow of N.I
- Measurement of N.I

* Who is responsible for N.I estimation in India?

Soln:-	Central	→ CSO [Central Statistics Organisation] in the ministry of statistics & program. Impl
	State	→ State Director of E & S

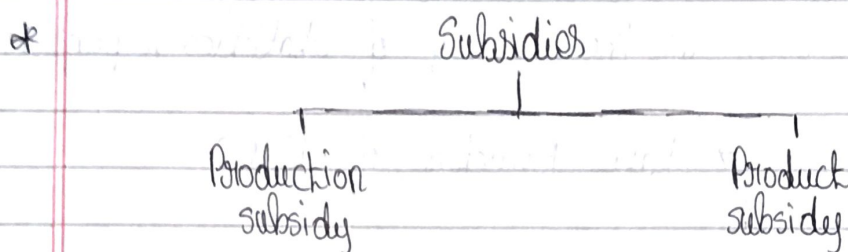
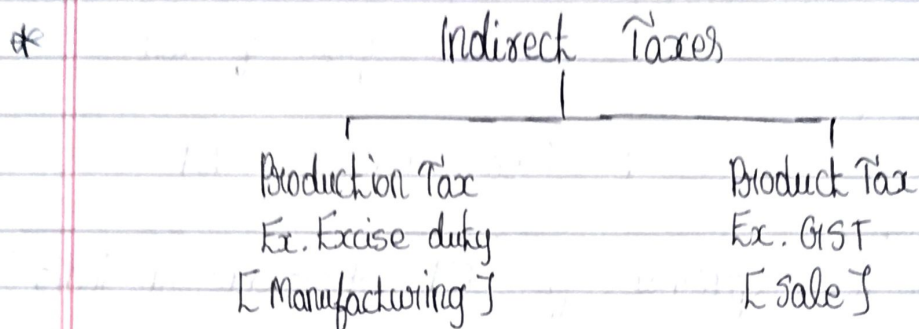
* Circular Flow of Income

- Continuous cycle of
- Production, distribution & consumption
- 3 Phases :-
 1. Production - goods and services
 2. Distribution - rent, wages, profit, interest
or Income
 3. Expenditure or Consumption



* Factors Cost Vs Market Price

New term Base price, factor price, market price



* $\text{Factor Cost} + \text{Production Tax} - \text{Production Subsidy} = \text{Base Price}$

* $\text{Base Price} + \text{Product Tax} - \text{Product Subsidy} = \text{Market Price}$

* $\text{Factory Price} + \text{Indirect Tax} - \text{Subsidy} = \text{Market Price}$

$$\boxed{FP + NIT = MP}$$

↓

Net Indirect Taxes
(IT - Subsidy)

*

Measurement of N.I

Value Added Method
[Production units]

Income Method
[Factor owners]

Expenditure Method
[Consumption & Investment]

*

Value Added Method / Product Method

Steps:-

- 1) Classify the sectors:- i) Primary sector [Agriculture]
ii) Secondary sector [Industry/MSO]
iii) Tertiary sector [Service]

- a) For each sector we compute GVAmp

GVAmp:- Gross Value Added at Market Price

AM	Chips
[Potato]	[£ 10]
£ 5	$10 - 5 = 5$
$\downarrow$ 10	

$$\text{GVAmp} = \text{Value of Output} - \text{Intermediate Consumption}$$

$$= [\text{Sales} + \text{closing stock} - \text{Opening stock} - \text{Intermediate Consumption}]$$

[For Each Sector]

= Sales + Change in stock - Intermediate Consumption

↓
Direct Expenses

$$3) \quad \text{GVAmp (PS)} + \text{GVAmp (SS)} + \text{GVAmp (TS)} = \text{GDPmp}$$

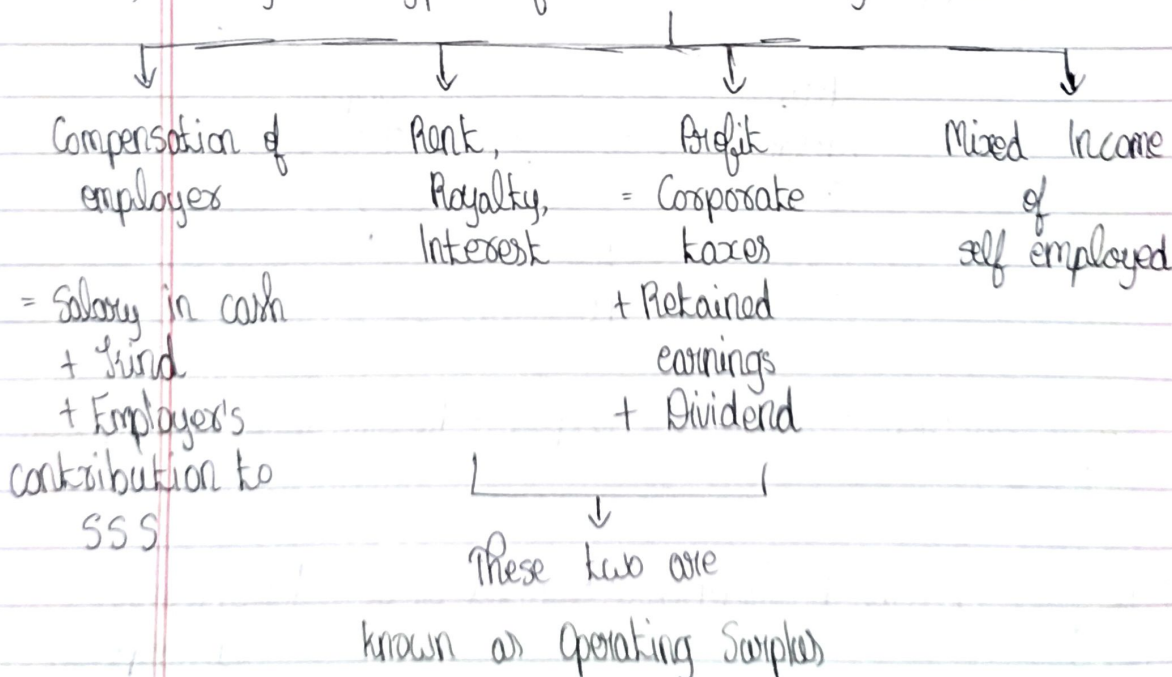
$$4) \quad \text{GDPmp} - \text{Depreciation} + \text{NFIA} - \text{NIT} = \text{National Income or NNPP}_{FC}$$

⇒ Note:- Goods produced for self consumption included in NI.

:- Imputed rent of a house OH included in NI

* Income Method

1) Mainly → 4 types of Income [Mainly]

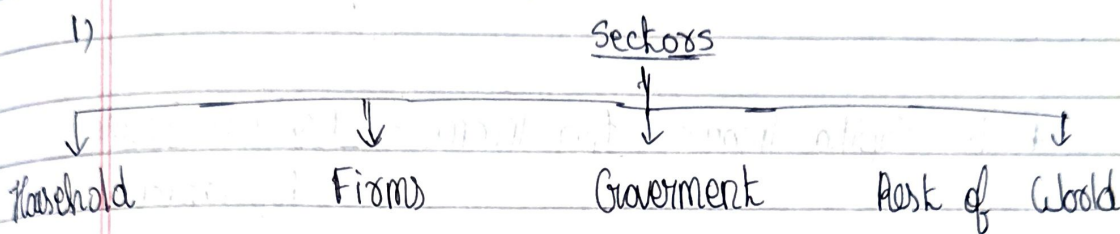


$$Q2) \quad COE + OS + MISE = NSPFC$$

3) $NDP_{FC} + NFIA = NNP_{FC}$ [National Income]

* Expenditure Method

12



→ Consumption Expenditure → Investment Expenditure → Consumption Expenditure → $X - M$ [Net exports]
→ Investment Expenditure

a) Expenditure - Methode $\Rightarrow$ - Consumption Exp
 $[HCE + GCE]$
 + Gross Domestic Capital Formation
 $[I_H + I_F + I_G]$
 Income of Household + firms + Government
 + Net Exports = GDP_{m.p}

3) $GDP_{mp} - Depn + NFIA - NIT = NNP_{FC}$
[National Income]

⇒ Note :- For Exp Method

$$\text{Cons Exp} + \underbrace{\text{Net Domestic CF}}_{\text{CF}} + \text{Net Exports} = \text{NBPmp}$$



* Factors Vs Transfer Payment/Income

1) Two sided One sided

2) Included in National Income Not Included in National Income

* Per Capita Income = Avg Income = $\frac{\text{National Income}}{\text{Population}}$

* Personal Income, Personal Disposable Income, Private Income

i) Personal Income [Households Income]

= National Income - Undistributed Profits -
Corporate Taxes - Net Interest Payment made
by Households + Transfer Payment from Firms
and Government.

ii) Personal Disposable Income:

= Personal Income - Personal Taxes - Non Tax
payments

iii) Private Income [Private sectors —→ Firms
↳ from anywhere ↳ Households]

= Factor Income from NDP + NFIA + National Debt Interest + Current transfer from Govt + Other net transfer from Rest of the World

* See practice qns from pdf

* Is GDP a reliable measure of Welfare?

Ans: NO!

Why?

→ Distribution of GDP

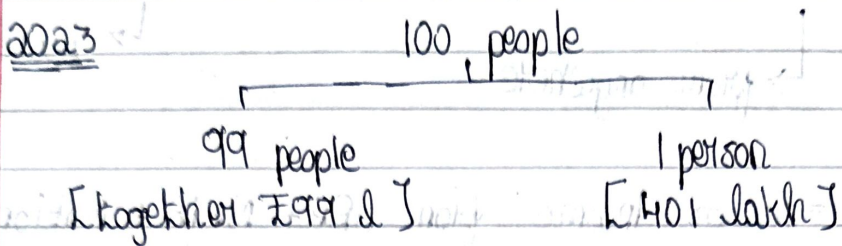
→ Externalities

→ Non Monetary Transaction

→ Kinds of goods produced

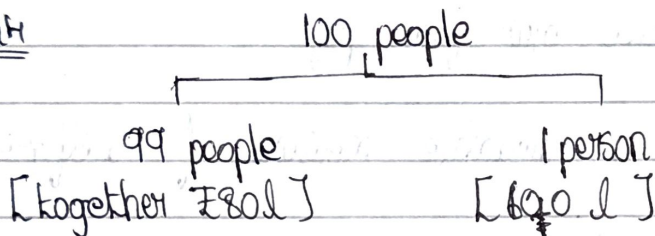
i) Distribution of GDP

2023



$$\begin{aligned}\text{Total GDP} &= 401 + 99 \\ &= ₹500 \text{ lakhs}\end{aligned}$$

2024



$$\text{Total GDP} = 680 \text{ lakhs}$$

ii) Externalities :- Advantages or Disadvantages that a society has to bear

→ Advantage :- Positive Externality [w/ GDP]

→ Disadvantage :- Negative Externality [w/ GDP]

iii) Non Monetary Transaction

Welfare ↑ GDP

iv) Kind of goods produced

Russia Vs Ukraine

Bombs $\uparrow$

Grains $\uparrow$

Missiles $\uparrow$

}

GDP $\uparrow$

Welfare $\downarrow$

* Human Activities

i) Economic Activities

[Money]

$\rightarrow$ Money

ii) Non Economic Activities

[Playing, painting, praying]

$\rightarrow$ Patriotism, Religion, Hobby, etc.

* SUMMARY

1. Gross - Depreciation = Net

2. BP + NFIA = NP

3. FP + NIT = MP

BP - Domestic Product

NP - National Product

FP - Factory Price

NFIA $\left\{ \begin{array}{l} \rightarrow + \text{Net factor Income from abroad} \\ \rightarrow - \text{Net factor Income to abroad} \end{array} \right.$

MP - Market Price

4. $NIT = \sum T - \text{Subsidies}$

[Net Indirect Taxes = Indirect taxes - Subsidies]

5. Human Activities

→ Economic :- Money

→ Non-Economic :- Fun, Hobby

6. $GDP \neq \text{Welfare}$

7. Measure of NI → Value Added Method
→ Income Method
→ Expenditure Method

8. National Income = NNP_{fc}

9. Subsidies are like negative of a tax

10. VAM [Value Added Method]

i) Value added at Each Sector = $[Sales + CS - OS] - [Intermediate Consumption]$

$$ii) GVA_{mp}[PS] + GVA_{mp}[SS] + GVA_{mp}[TS] = GDP_{mp}$$

$$iii) GDP_{mp} - Depreciation + NFIA - NIT = NNP_{FC}$$

11. Income Method

$$i) COE + MISE + \underbrace{R + R + I + P}_{\downarrow} = NNP_{FC}$$

Operating Expense

$$ii) NNP_{FC} + NFIA = NNP_{FC}$$

12. Expenditure Method

i) Consumption Expenditure $\begin{cases} \rightarrow Govt \\ \rightarrow Household \end{cases}$

Formation

ii) Gross Domestic Capital $\downarrow$ [Investment Expenditure]

Households

Govt

Firms

iii) Net Exports $[X - M]$

$$i + ii + iii = GDP_{mp} - Depn + NFIA - NIT = NNP_{FC}$$

$$13. GDP \text{ Deflator} = \frac{\text{Nominal Income}}{\text{Real Income}} \times 100$$

14. Nominal Income = GRP at current prices

Real Income = GRP at base year prices

15. Depon = Capital Consumption Allowance

16. GRP Deflator = Price Index

17. Items not to be included in N.I :-

a) Services for self consumption

b) Buying & selling of shares & debentures

c) Buying & selling of second hand goods

d) Transfer Income

18. Items to be included in N.I :-

a) Brokerage / Commission on sale or purchase of shares, debentures, second hand goods

b) Anything that would create new goods & services.

Unit - 2

Keynesian Theory

J.M Keynes

- Two Sectors of NI
- Three Sectors of NI
- Four Sectors of NI
- Equilibrium
- Investment Multiplier

Two Sectors

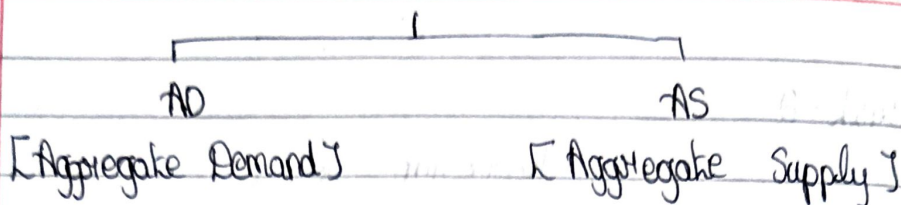
Households
+
Firms

Three Sectors

Households
+
Firms
+
Government

Four Sectors

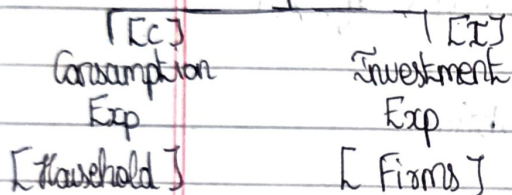
Households
+
Firms
+
Government
+
Foreign Sectors



i) Two Sector Economy:-

AD = Agg Exp

AS = National Income



Consumption
C

Savings
S

*

Equilibrium Condition
[Two Sector Economy]

$$AD = AS \text{ ———— (1)}$$

$$\text{or } C + I = C + S$$

$$\therefore I = S \text{ ———— (2)}$$

*

$$AD = C + I$$

y - level of Income
b - MPC

$$AD = C + \bar{I}$$

$$C = a + by$$

Autonomous
Consumption (a)

Induced
Consumption (by)

Consumption Expenditure that doesn't depend on level of Income even if someone is not making money it will still be incurred

It is that portion of consumption expenditure that certainly depends on Income level

$$AD = C + \bar{I}$$

Assumed to be constant [fixed]

APC :- Average Propensity to Consume

APS :- Average Propensity to Save

MPC :- Marginal Propensity to Consume

MPS :- Marginal Propensity to Save

i) $APC = \frac{C}{Y}$ Ex :- $Y = ₹1,000$ $C = ₹600$

$$APC = \frac{600}{1000} = 0.6$$

ii) ~~APS = Average P~~

$$APS = \frac{S}{Y} \quad \text{Ex: } Y = 1,000 \quad C = 600 \quad S = 400$$

$$APS = \frac{400}{1,000} = 0.4$$

$$\therefore APC + APS = 1 \quad C + S = Y$$

Dividing by Y

$$\frac{C}{Y} + \frac{S}{Y} = \frac{Y}{Y}$$

$$APC + APS = 1$$

iii) $MPC = \frac{\Delta C}{\Delta Y}$ Δ : Change

$$= \frac{900 - 600}{2000 - 1000} \quad \begin{array}{l} Y \\ 1000 \rightarrow \\ 2000 \end{array} \quad \begin{array}{l} C \\ 600 \rightarrow \\ 900 \end{array}$$

$$= \frac{300}{1000} = 0.3$$

iv) $MPS = \frac{\Delta S}{\Delta Y}$

$$\begin{array}{l} Y \\ 1000 \rightarrow \\ 2000 \end{array} \quad \begin{array}{l} S \\ 400 \rightarrow \\ 1,100 \end{array}$$

$$= \frac{700}{1000} = 0.7$$

* $b = MPC$

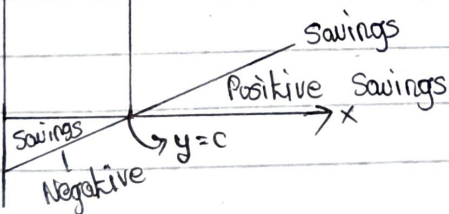
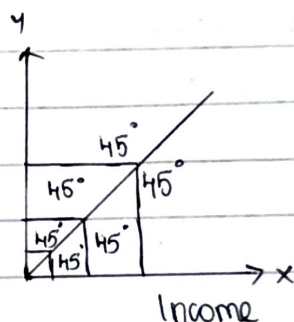
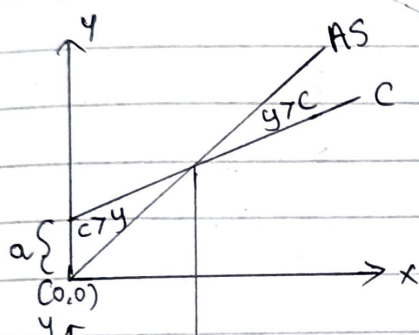
$APC + APS = 1$

$MPC + MPS = 1$

$0 < b < 1$

$MPC/MPS \rightarrow$ lies between 0 & 1

AS is a 45° line



* Consumption starts from y axis

* As Income rises APC falls

$\left[\begin{array}{l} y \uparrow \text{ APC } \downarrow \\ y \uparrow \text{ APS } \uparrow \end{array} \right]$

* As Income rises APS rises

$y : APC \rightarrow$ Inverse Relation

$y : APS \rightarrow$ Direct Relation

$$0 < b < 1$$

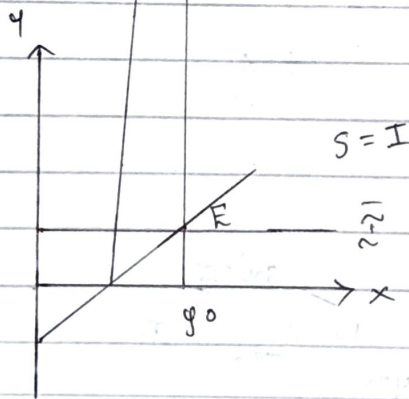
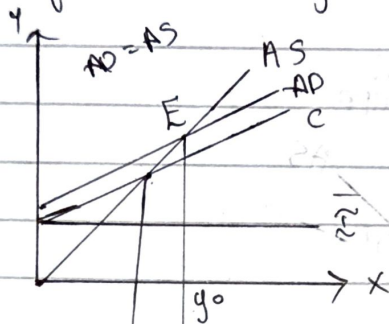
$$0 < MPS < 1$$

$$APC + APS = 1 \quad ; \quad MPC + mps = 1$$

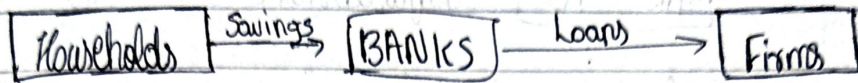
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Equilibrium Diagram

When $AS = C$
Savings = 0



✱



Loans :- Injection [Adds money]

水

AS > AD :- Deflationary Gap

*

→ Households → Firms → Government

$$AD = C + I + G \quad ; \quad C : \begin{array}{l} \text{Consumption} \\ \text{Auto} \quad \text{Induced} \end{array} \quad \text{Exp}$$

Government imposes Taxes

T : Taxes

$\tilde{I}$: Investment Exp
↓
Also $\tilde{I}$ fixed

$$Y - T = C + S$$

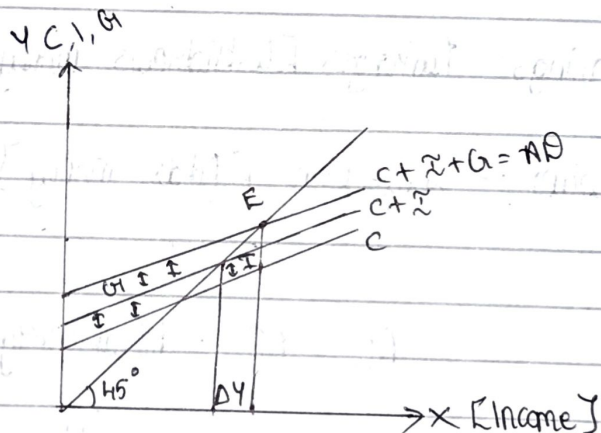
$$Y = C + S + T \quad ; \quad \boxed{AS = C + S + T}$$

$$\boxed{AD = AS} \quad \text{Equilibrium} \quad \text{--- ①}$$

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

$$\boxed{\therefore I + G = S + T} \quad \text{--- ②}$$

Equilibrium:



*

3 sectors [inter relationship]

From Household

- 1) To Govt
 - a) Provision for factor services
 - b) Taxes
 - c) Savings $\rightarrow$ Borrow

From Govt

- 1) To Households
 - a) Factor Payments
 - b) Transfer payments

From Firms

- 1) To Households
 - a) Factor Payment
 - b) Goods & Services

a) To Business

- a) Factor services
- b) Payment of G & S
- c) Save $\rightarrow$ Borrow

a) To Business

- a) Subsidies
- b) Payments for G & S

a) To Govt

- a) Taxes
- b) Goods & Services

*

Four Sector [Open Economy]

1) Households

2) Firms

3) Government

4) Foreign Sector [X - M]

$$AS = Y = C + S + T$$

Same as 3 sector model

$$AD = C + \tilde{Z} + G + (X - M)$$

X: Exports; M: Imports

①

$$AS = AD$$

X - M: Net Exports

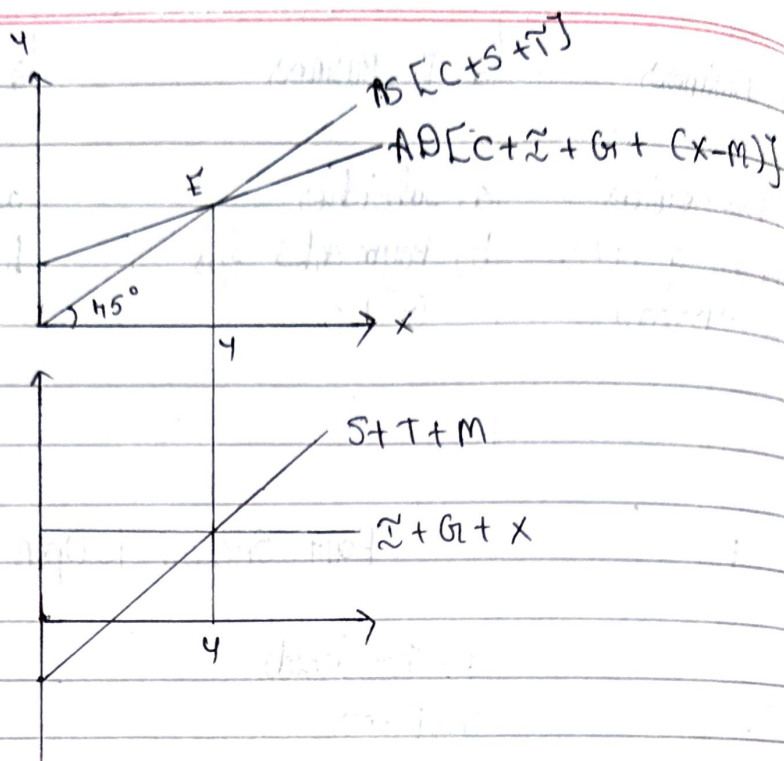
$$C + S + T = C + \tilde{Z} + G + X - M$$

②

$$S + T + M = \tilde{Z} + G + X$$

* Injection:- Whatever adds money to circular flow [exports]

* Leakages:- Whatever takes money from circular flow [Imports]



Deflationary Gap

If AD for an output is less than full employment level of output, then we say deficient demand.

↳ Deflationary/Recessionary Gap

Inflationary Gap

If AD for an output is greater than full employment level of output, then we say excess demand.

↳ Inflationary Gap

* Ch-6

Keynesian Theory

Investment Multiplier

$b = \text{MPC}$ [Marginal Propensity to Consume]

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

$$\begin{array}{cc} Y & C \\ \left(\begin{array}{cc} 1000 & 800 \\ 2000 & 1400 \end{array} \right) \end{array}$$

$$\text{MPC} = \frac{600}{1000} = 0.6$$

$\Rightarrow$ Suppose $\text{MPC} = 0.8$

$\Delta \bar{I}$	ΔY	ΔC	ΔS
1000	1000	800	200
	800 +	640	160
	640 +	512	128
	$\vdots$	$\vdots$	$\vdots$
(*) <u>5000</u>			

$\therefore$ The ratio of rise in Income to the rise in Investment is called Investment Multiplier.

$$\Rightarrow k = \frac{\Delta Y}{\Delta \bar{I}} = \frac{1}{1-b} \quad \left[\begin{array}{l} \text{2 sector} \\ \text{Economy} \end{array} \right]$$

$\downarrow$
MPC

$\therefore$ Multiplier

$$k = \frac{1}{1-0.8} = \frac{1}{0.2} = 5$$

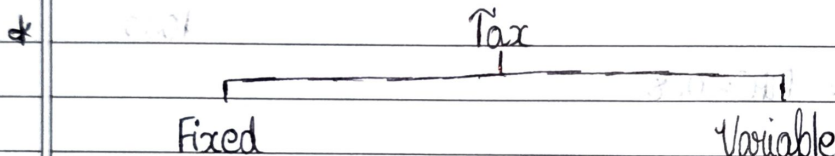
So, $\Delta \bar{I} = 1000$; $\Delta Y = 5 \times 1000 = 5000$ (*)

* [4 Sector Economy]

$$\text{Foreign Trade Multiplier} = \left[\frac{1}{1-b+m} \right]$$

m : Marginal Propensity to import

$$\Rightarrow k = \frac{1}{1-MPC} = \frac{1}{MPS}$$



[When both given] $\Rightarrow k = \frac{1}{1-b(1-t)}$

$\rightarrow$ Variable portion

* FORMULAS

$$1) b = \frac{1}{1-MPC} = \frac{1}{MPS} = \frac{\Delta Y}{\Delta Z}$$

$$2) \text{ Foreign Trade Multiplier (FTM)} = \frac{1}{1-b+m}$$

$$3) \text{ Trade Balance} = X - M = \text{Net exports}$$

- $\rightarrow$ Positive :- Surplus
- $\rightarrow$ Negative :- Deficit

4) Equilibrium Conditions is $AS = AD$

i) 2 Sector Economy $\rightarrow Y = C + \bar{Z}$

$$\therefore Y = a + by_d + \bar{Z}$$

ii) 3 Sector Economy $\rightarrow Y = C + \bar{Z} + G_1$

$$\therefore Y = a + by_d + \bar{Z} + G_1$$

iii) 4 Sector Economy $\rightarrow Y = C + \bar{Z} + G_1 + (X - m)$

$$\therefore Y = a + by_d + \bar{Z} + G_1 + X - m$$

$$Y_d = Y - T + \text{Transfer Payments}$$

* As per Keynes, Equilibrium can be arrived :-

i) At less than full employment level

ii) At full employment level

iii) At more than full employment level.