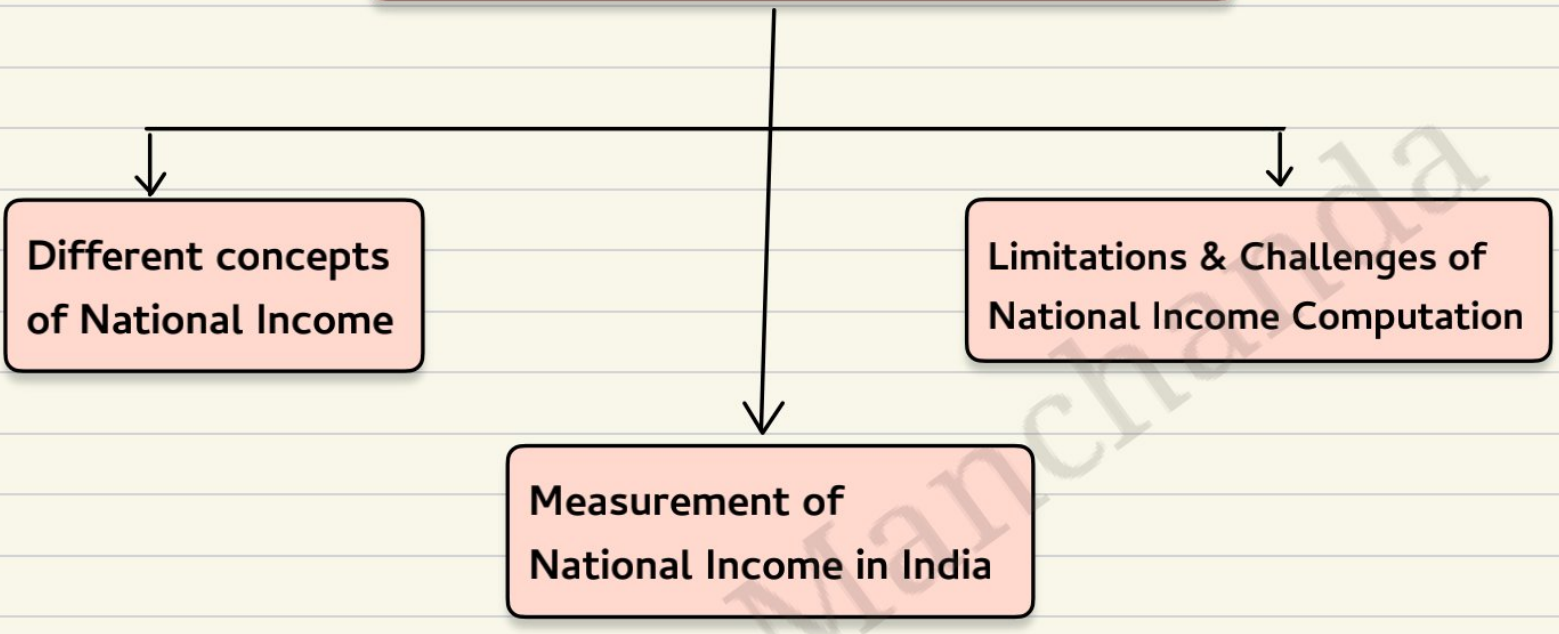
National Income

Determination of NATIONAL INCOME

V.easy

Unit-1: NATIONAL INCOME Accounting



Different Concepts of NATIONAL INCOME

Gross Domestic Product

Gross domestic product (GDP) is a measure of the market value of all final economic goods and services, produced within the domestic territory of a country during a given time period.

It includes the value of goods produced, such as houses and mobiles, and the value of services, such as telecom, health, insurance.
The output of each of these is valued at its market price, and the values are added together to get GDP.

1. Market value

100 cars

200 Mobile phone

10,000 litres

Market value	5 crores	20,00,000	500,000

GDP = 5,25,00,000

2. Final Goods & Services: Those goods which are either used for consumption or for Investment [Capital Goods]

Consumption Investment

→ Value of Intermediate goods are not included.

3 litres of Milk
Market value ₹150

Used in further prod.

Market value ₹500

Already includes the value of Milk ₹150

→ Value of Milk will not be incl. in GDP

Consumed by Household

This is final goods, will be incl. in GDP.

* Economic goods - which are exchange in a Market.
→ Food prepared at home for family members is not included.

3. Domestic Territory : Geographical boundary of the County.

Hardik (Indian) - Services in India - ₹100
Taylor Swift (Non-India) - concert in India - ₹10cr. -] will be included in GDP

→ Hardik (Indian) - Services outside India] not incl. in GDP

4. Given time period - GDP is a flow variable, includes goods & services during the year.

Example

	Price		Qty	GDP	
2022	10,000	x	10	100,000	Nominal GDP
2023	12000	x	9	108000	

Nominal GDP = Current year Market price x Qty of goods & services prod during the year

↓

GDP at current prices

Nominal GDP changes bcz of 2 reason

- Change in Qty
- Change in Prices

→ If our goal is to measure production & its changes over time, we need to eliminate the effect of change in prices on our measure of GDP

↓

For this, we need to calculate Real GDP

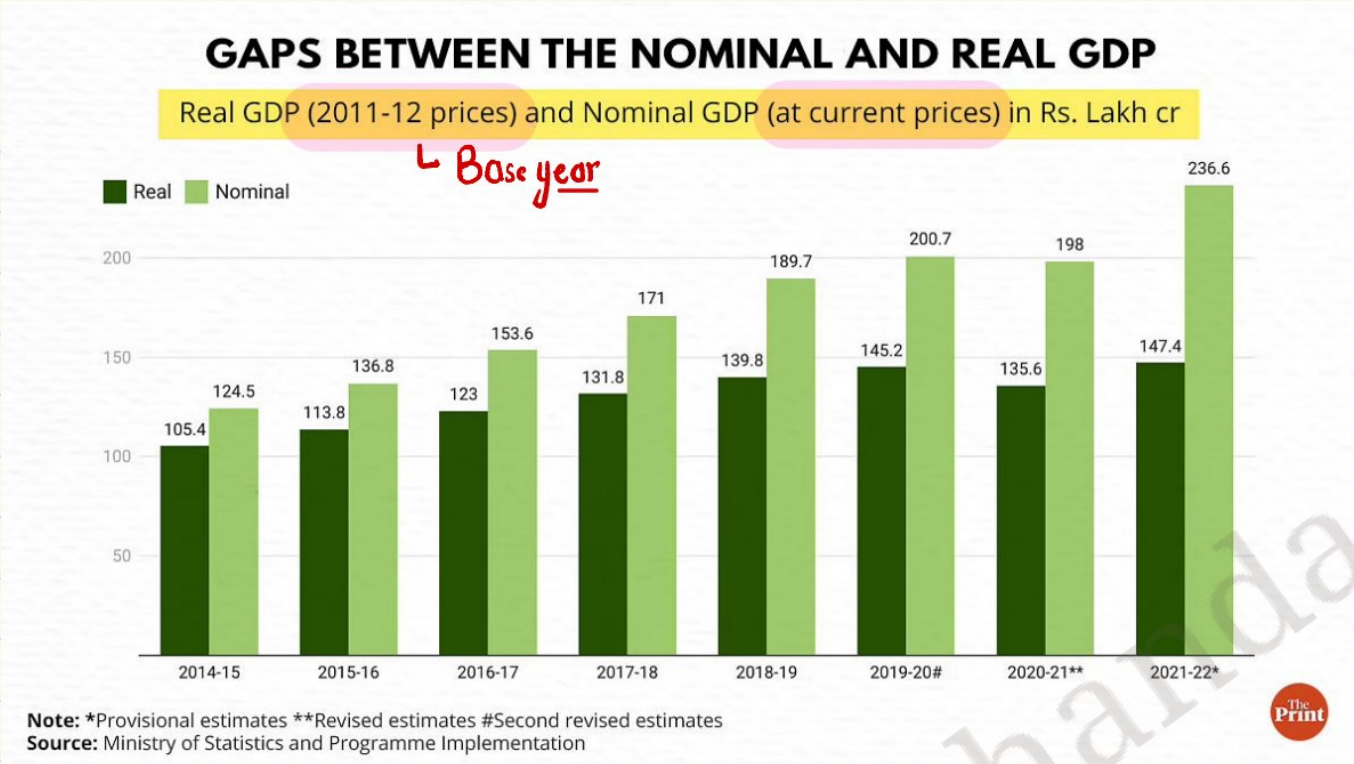
↓

GDP is calculated using the price of selected 'Base year'.

* GDP at Constant prices.

	Price		Qty	Nominal GDP	Real GDP
2022	10,000	x	10	100,000	100,000 ↓
2023	12000	x	9	108000	90,000

* Real GDP is not affected by change in Prices.



L Base year

Example:

	Qty	Price	Nominal	Real GDP
✓ 2011-12	100	20	2000	2000
2022-23	150	50	7500	3000

$$\text{Real GDP Growth \%} = \frac{3000 - 2000}{2000} \times 100$$

$$= \frac{1000}{2000} \times 100 = 50\%$$

$$\rightarrow \quad 2000 + \frac{50}{100} \times 2000$$

$$= \quad 3000$$

Real GDP or Gross Domestic Product (GDP) at Constant (2011-12) Prices in Q1 2022-23 is estimated to attain a level of ₹ 36.85 lakh crore, as against ₹ 32.46 lakh crore in Q1 2021-22, showing a growth of 13.5 percent as ~~compared to 20.1 percent in Q1 2021-22~~

Base year

Real GDP [22-23] - Q_1 ₹36.85
Real GDP [21-22] - Q_1 - ₹32.46

$$\Rightarrow \frac{36.85 - 32.46}{32.46} \times 100 = \frac{4.39}{32.46} \times 100$$

$$= 13.53\%$$

$$= \frac{CY - PY}{PY} \times 100$$

Ex-

	Price	Qty	Nominal GDP	Real GDP
2011-12	150	50	7500	7500
2022-23	300	200	60,000	30,000
			↓	↓
			200 x 300	200 x 150

$$\Rightarrow \frac{\text{Nominal GDP}}{\text{Real GDP}} = \frac{\cancel{200} \times 300}{\cancel{200} \times 150}$$

$$= \frac{300}{150} = 2$$

↓

GDP Deflator

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

$= \frac{60,000}{30,000} \times 100 = 200$

Product जो ₹100 का tha in the base year (11-12), wo C.Y (22-23) me ₹200 ka hogya.

Ex- Nominal GDP - ₹7500
GDP deflator - 250, Calculate Real GDP

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

$= \frac{7500}{250} \times 100$

$= 3000$

GDP Deflator = Can be used to deflate or take inflation out of GDP.

Price Index → $\frac{\text{Price of CY}}{\text{Price of Base year.}}$

→ Deflator measures the change in prices that has occurred b/w base year & current year.

Example-

	Nominal GDP	Real GDP
2011-12	2000	2000
2022-23	10,000	4000

1. GDP deflator of the base year -
2. GDP deflator of 22-23.

1. GDP deflator of 2011-12 = $\frac{2000}{2000} \times 100 = 100$

→ The deflator of the base year is always 100

2. GDP deflator of 22-23 = $\frac{10,000}{4000} \times 100 = 250$

Ex- Nominal GDP = 9000
Real GDP = 10,000

GDP deflator = $\frac{9000}{10,000} \times 100$
= 90

ILLUSTRATION 1

Find out GDP Deflator? Interpret It

			(In Billion Rs.)
Years	**Nominal GDP**	**Real GDP**	**GDP Deflator**
2014	500	500	100
2015	800	650	123.08
2016	1150	800	143.75 → Highest
2017	1300	950	136.84
2018	1550	1190	130.25
2019	1700	1240	137.10

GDP Deflator > 100, this indicates that price levels has increased as compared to the base year.

ILLUSTRATION 2

The nominal and real GDP respectively of a country in a particular year are ₹ 3000 Crores and ₹ 4700 Crores respectively. Calculate GDP deflator and comment on the level of prices of the year in comparison with the base year.

$$\text{GDP deflator} = \frac{3000}{4700} \times 100 = 63.83$$

The price level has fallen since GDP deflator is less than 100.

ILLUSTRATION 3

Find nominal GDP if real GDP = 450 and price index = 120

GDP deflator

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

$$= 540$$

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

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

ILLUSTRATION 4

Suppose nominal ~~GNP~~ GDP of a country in 2010 is given at ₹ 600 Crores and price index is given as base year 2010 is 100. Now let the nominal GDP increases to ₹ 1200 Crores in 2018 and the price index rises to 110, find out real GDP?

	Nominal GDP	Price Index - GDP def
Base year 2010	600 cr.	100
2018	1200 cr.	110

(i) Real GDP of 2010 - 600 cr.

→ Real GDP of 2018 = $\frac{1200 \text{ cr.}}{110} \times 100$

= ₹ 1090.91 cr.

→ We can calculate Inflation rate using GDP deflator

$$\text{Inflation rate in year 2} = \frac{\text{GDP deflator in year 2} - \text{GDP deflator in year 1}}{\text{GDP deflation in year 1}} \times 100$$

	(In Billion Rs.)
Years	GDP Deflator
2014	100
2015	123.08
✓ 2016	143.75
2017	136.84
2018	130.25
2019	137.10

Inflation Rate

→ $\frac{123.08 - 100}{100} \times 100 = 23.08\%$

$\frac{143.75 - 123.08}{123.08} \times 100 = 16.79$

↳ $\frac{136.84 - 143.75}{143.75} \times 100 = -4.81\%$

↳ $\frac{137.10 - 130.25}{130.25} \times 100 = 5.26\%$

→ Factors of Production

- Land — Rent 20
- Labour — Wages 10
- Capital — Interest 10
- Entrepreneur — Profit 10

Factor Cost / Factor Income

Cost of Calculator - 40+10

Factor cost : 50 → Amt Received by factor owners

+ Indirect Taxes - 10

(-) Subsidy (5)

Market price 55 → Amt to be paid by buyer.

→ Factor cost + Net Indirect Taxes = Market price

↓

+ Indirect Taxes − Subsidy

Eg- GDP MP = ₹500
Indirect Taxes = ₹40
Subsidies = ₹10

Calculate GDPFC

GDPFC = GDP MP − Indirect Taxes + Subsidy
= 500 − 40 + 10
= ₹470

Eg. GDPFC = 850
Net Indirect Taxes = 80
Subsidies = 20

Calculate GDPMP?

GDPMP = GDPFC + Ind. Tax − Subsidy

Net Indirect Taxes

= 850 + 80
= ₹930

Domestic v/s National

Domestic

Goods & Serviced produced in INDIA whether Resident or Non-Resident

- Income earned by Residents within Domestic territory

A

- Income earned by Non-Residents within Domestic territory

B

→ Domestic = A + B

Domestic − B = A

National

Should be produced by INDIAN Residents whether in India or Outside India.

- Income earned by Residents within Domestic Territory

A

- Income earned by Residents outside the Domestic territory.

C

National = A + C

National − C = A

→ Domestic − B = National − C

Domestic + C − B = National

- Domestic + C − B → Factor Income from Abroad
- Domestic + C − B → Factor Income to Abroad

→ Domestic + Factor Income from Abroad − Factor Income to Abroad = National

Net factor Income from Abrod [NFIA]

Ex- GDP MP - 1200
Factor Income from abroad - 200
Factor Income to abroad - 250,

GNP MP ?

GNP MP = GDP MP + Fact Inc from abroad - factor Income to Abroad

= 1200 + 200 - 250

GNP MP = 1150

	Domestic	National
1. Income earned by Indian Co. in USA	✗	✓
2. Income earned by American Co. in India	✓	✗
3. Income earned by Indian Resident in India	✓	✓

Gross v/s Net

Eg- 2022-23

	MP
Machines produced -	₹ 10,000 ✓
Other Goods & Services produced -	₹40,000
GDP_{MP}	₹50,000

↳ Useful life > 1 year

Net = Gross - Depreciation
└ Consumption of fixed capital.

→ Dep - Portion of fixed cap used up in the process of production.

Important formulas

1. $GNP_{FC} = GDP_{FC} + NFIA$
2. $GDP_{MP} = GDP_{FC}$ + Indirect Taxes - Subsidies
   or + Net Indirect Taxes
3. $GNP_{FC} = GDP_{MP} + NFIA - Indirect\ Taxes + Subsidies$
4. $NNP_{FC} = GDP_{MP} - Dep + NFIA - Ind.\ Tax + Subsidies$
5. $GNP_{MP} = NDP_{FC} + Dep + NFIA + Ind.\ Tax - Subsidies$

Multiple Choice Questions

1) _____ is a measure of the market value of all final economic goods and services, produced within the domestic territory of a country by normal residents during an accounting year including net factor incomes from abroad.

a) GDP

b) GNP

c) NDP

d) NNP

GDP + NFIA

2) If Net Factor Income from Abroad is positive, then GNP would be _____ than GDP

a) Greater

b) Lower

c) Equal

d) Can't say

+ FIFA − FITA

60 > 70

GNP > GDP

3) _____is a measure of the market value of all final economic goods and services, produced by normal residents within the domestic territory of a country including Net Factor Income from Abroad during an accounting year. excluding depreciation.

NNP

a) GDP ✗

b) GNP

c) NNP

d) NDP ✗

Ind. Dep

MP & FC

FC + Ind. Tax - Sub = MP

4) Gross Domestic Product (GDP) of any nation

a) excludes capital consumption and intermediate consumption

b) is inclusive of capital consumption or depreciation

c) is inclusive of indirect taxes but excludes subsidies

d) None of the above

5) Gross National Product at market prices GNP_{MP} is

a) GDP_{MP} + Net Factor Income from Abroad

b) GDP_{MP} - Net Factor Income from Abroad

c) GDP_{MP} - Depreciation

d) GDP_{MP} + Net Indirect Taxes

N = D + NFIA

6) The basis of distinction between market price and factor cost is

a) net factor income from abroad

b) net indirect taxes (i.e., Indirect taxes - Subsidies)

c) net indirect taxes (i.e., Indirect taxes + Subsidies)

d) depreciation (consumption of fixed capital)

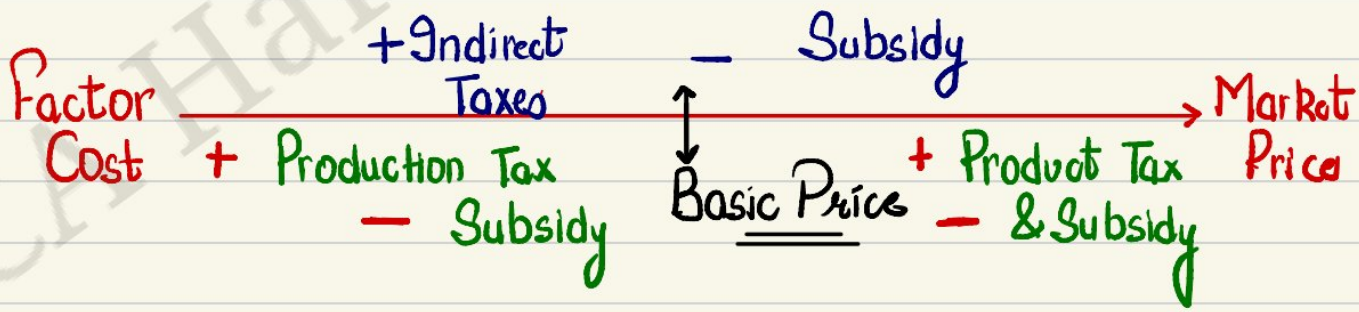
Exclusions from GDP

1. Transfer Payment / Income: These payments do not result in the production of goods or services.
   Non-factor Income
   Ex. Social security benefits, Donation, gifts etc.

2. Financial transaction: Stocks / shares which are exchanged in the Market are not included.
   However, Value of services that accompany sale & purchase are included.
   ↳ brokerage by zerodha

3. Sale of 2nd hand Goods.

4. Unreported Output :- Illegal transactions
   Ex. Gambling



Taxes & Subsidy

Production Tax & Subsidy

→ Independent of volume of Actual Production

Ex- factory license, pollution tax, Reg. fees, etc.

Subsidy - Ex- Subsidies to small Industries in villages.

Product Tax & Subsidy

- On the basis of units of production

Ex- GST, import & export duty etc.

Ex- Subsidies on LPG, fertilisers, etc.

⇒ Basic Price = Factor cost + Production Tax - Production Subsidy

Market price = Basic Price + Product Tax - Product Subsidy

Market Price = Factor cost
+ Production Tax
- Production Subsidy
+ Product Tax
- Product Subsidy

} Basic Price

* Calculation of National Income using Income Method

→ Wages - ₹100 - Compensation of employees

→ Rent - ₹50

→ Interest - ₹20

→ Profit - ₹130

Operating Surplus

Factor cost / Factor Income ₹300

→ Whatever is produced by a producing unit is distributed among factors of production.

→ Operating Surplus = Rent + Interest + Profit
(Rent + Interest: Income from property; Profit: Income from entrepreneurship)

↓ Represents the income earned by businesses & entrepreneurs from their productive activities

→ Op. Surplus = Income from prop + Income from Entrepreneur-ship

→ Mixed Income of Self-employed

→ Uses own Labour
→ Own Capital
→ Own property
→ Entrepreneur

Cannot differentiate b/w wages, Int or profit

Enterprises which are not incorporated, uses their own land, Labour, capital & Entrepreneurship.

→ Remuneration earned by Self employed is known as Mixed Income.

Domestic Income :- Total factor income earned by factors of production within domestic territory.

NDP FC

→ Wages + Rent + Interest + Profit + Mixed Income of Self employed − Compensation of employees + Operating profit +

National Income = Domestic Income + NFIA

NNP$_{FC}$ = NDP$_{FC}$ + NFIA

Ques:- Calculate National Income from the following : (NNP$_{FC}$)

	₹ in crores
Compensation of employees	520
Factor Income to abroad	30
Net factor income from abroad	70
Net Indirect Taxes	40
Income from property	310
Rent	60
Mixed Income of Self employed	605
Profits	420

NNP$_{FC}$ = 520 + 70 + 310 + 605 + 420

= ₹ 1925 crores

$NNP_{FC} = NDP_{FC} + NFIA$

Income earned by Residents from Abroad [FIFA] − Income earned by Non-Residents from India [FITA]

Compensation from employees − Compensation from emp.

1. Net compensation from employees.
+ Net Income from property
+ Net Income from entrepreneurship
+ Net Retained earning

Profit - 100 (60 + 40)

NFIA = Net compensation from emp.
+ Net Income from property & entrepreneurship
+ Net Retaining earnings.

$GDP_{FC} = NDP_{FC} + Depreciation$

= Comp of Emp
+ Op. Surplus [Rent + Int + Profit]
+ Mixed Inc of self emp
+ Dep.

- Per Capita Income / Per capita GDP

↓

Country's GDP, adj by Inflation - Real GDP
Total population

→ Measure of country's economic output per person.

→ It serves as Indicator of the Standard of living of a County.

7) The GDP per capita is
(a) a measure of a country's economic output per person ✓
(b) actual current income receipts of persons ✗
(c) national income divided by population ✓
(d) (a)and (c) above ✓

National Income v/s Personal Income

↓ ↓

Includes factor income earned, irrespective of whether received or not.

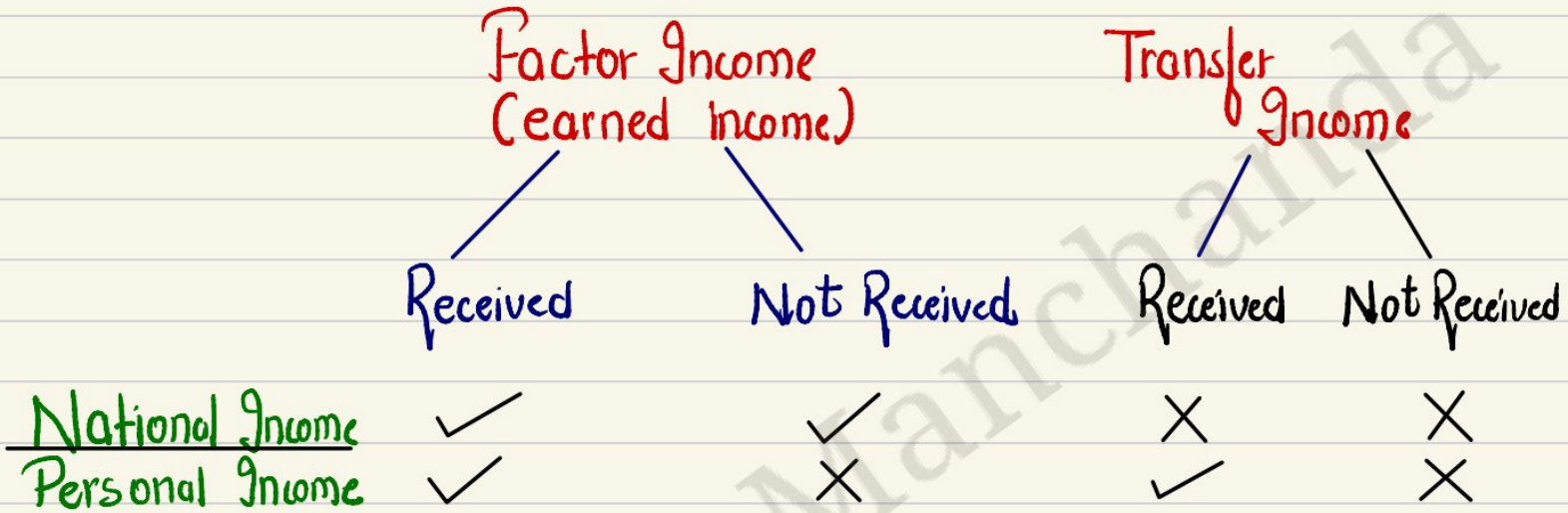
Includes income Received by Household Sector including NPISH.

↳ Factor Income as well as Transfer Income are included.

→ Measure of Income earned factor

→ Measure of Actual Income Received from all Sources.

NPISH - Non Profit Institution Serving Households.
- They receive voluntary contributions, donations, grants.
Ex. Charitable organisation, educational organisations, etc.



Personal Income = National Income
(-) Income earned but not Received
+ Income Received but not earned

Important points :-

1. Individuals also contribute income which they do not receive.

- Undistributed Corporate Profits
- Contribution of employers to Social Security - EPF

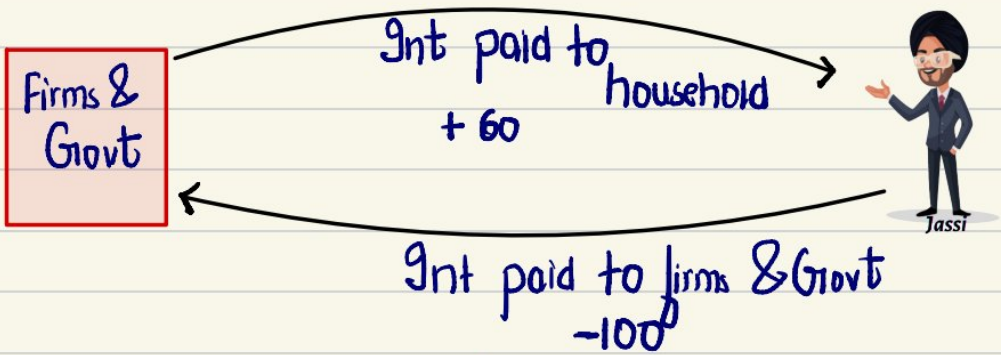
Ex- Corporate Profit - ₹100 - National income

Tax	Dividend	Retained earnings / Undistributed profits
25	15	60

Only this is included in Personal Income

2. Personal Income excludes :-
   a) Retained earnings
   b) Indirect business tax
   c) Corporate Income Tax
   d) Contribution towards Social Security.

3.



Net Int = (40)

— Net Interest paid by household to firms & Govt is also deducted from National Income.

Net Int payment = Int paid - Int Received.

Personal Income = National Income
- Undistributed profits
- Corporate Tax
+ Transfer payments to the households
- Net Int paid by households

4. National income is not the Sum of personal income

⇒ Disposable Personal Income
↓
Personal Income
(-) Personal Income Tax
(-) Non Tax payment — fees, challan

* Money in the hands of households, available for consumption, Savings.

Eg-

₹ in Crores

NDP_{FC}	8000
NFIA	200 +
Undistributed profits	1000 (−)
Corporate Tax	500 (−)
Int rec. by households	1500 +
Int paid by households	1200 −
Transfer income	300 +
Personal Tax	500

Net Int paid
└ 1200 − 1500 = (300)

Personal Income = 8000 + 200 − 1000 − 500
+ 1500 − 1200 + 300
= ₹7300

Disposable Personal Income = 7300 − 500
= ₹6800

ILLUSTRATION 5

From the following data, calculate NNP_{FC}, NNP_{MP}, GNP_{MP} and GDP_{MP}.

Items	**₹ in Crores**
Operating surplus — Rent, Int & Prop.	*2000*
Mixed income of self-employed	*1100*
Rent	*550*
Profit	*800*
Net indirect tax	*450*
Consumption of fixed capital - Dep.	*400*
Net factor income from abroad	*-50*
Compensation of employees - wages	*1000*

1. NNP_{FC} = 2000 + 1100 − 50 + 1000
   = 4050

2. NNP_{MP} = NNP_{FC} + Indirect Taxes − Subsidy
   = 4050 + 450
   = 4500

3. GNP_{MP} = NNP_{MP} + Dep
   = 4500 + 400
   = 4900

4. GDP_{MP} = GNP_{MP} − NFIA ⇒ 4900 − (50) = 4950

ILLUSTRATION 7

Calculate the aggregate value of depreciation when the GDP at market price of a country in a particular year was ₹ 1,100 Crores. Net Factor Income from Abroad was ₹ 100 Crores. The value of Indirect taxes – Subsidies was ₹ 150 Crores and National Income was ₹ 850 Crores.

$GDP_{MP} = 1100$, NFIA = 100 , NIT = 150

$NNP_{FC} = 850$

$GDP_{MP} = NNP_{FC} + Dep - NFIA + NIT$

$1100 = 850 + Dep - 100 + 150$

$Dep = ₹ 200$ crores

Domestic Income (NDP$_{FC}$)

- Income from Domestic Product accruing to PRIVATE Sector
  - Household
  - Business
- Income from Domestic Product accruing to PUBLIC / Govt Sector
  - → Income from property & Entrepreneurship accruing to Govt administrative departments
  - → Savings of non-departmental enterprises.
    - LIC

NDP_{FC} = Income from Domestic product accruing to Private Sector + Income from Domestic product accruing to Govt. Sector

Factor Income

Income from Domestic Product accruing Private Sector = NDP_{FC} (-) Income from Domestic product accruing to Govt Sector

Household Business

Private Income = Income which accrues to the Private sector from all sources within & outside the country.

- all sources → factor Income, Transfer income
- outside the country → NFIA

Private Income = Income from Domestic product accruing to Private Sector + NFIA + Transfer Income

→ Transfer Income = 1. Int on National Debt (for consumption)
↳ Loan taken by Govt.
2. Transfers from Govt department
3. Transfers from Rest of the world.

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* Personal Income v/s Private Income

→ Private Income = Personal Income
+ Corporate Tax on profits
+ Undistributed profits

ILLUSTRATION 6

From the following data, estimate National Income and Personal Income.

Items	**₹. in Crores**
Net national product at market price	*1,891*
Income from property and entrepreneurship accruing to government administrative departments	*(45)*
Indirect taxes - Ignore	*175*
Subsidies - Ignore	*30*
Saving of non-departmental enterprises ✓	*(10)*
Interest on National debt — Transfer Income	*+15*
Current transfers from government - Transfer Income -	*+35*
Current transfers from rest of the world	*+20*
Saving of private corporate sector - Retained earning	*25*
Corporate profit tax	*25*

National Income = NNP$_{MP}$ − Indirect Taxes + Subsidies

[NNP$_{FC}$] = 1891 − 175 + 30

= 1746

Private Income = NNP$_{FC}$

= 1746 −45 −10 +15 +35 +20

Private Income = 1761

Business - Profit - 100 - National Income

Private Sector Income

Dividend 40 | Retained 20 | Tax 40

Rough

Personal Income = 1746 - 45 - 10 + 15 + 35 + 20 - 25 - 25

Household = ₹ 1711

ILLUSTRATION 8

On basis of following information, calculate NNP at market price and Disposable personal income

Items	**₹ in Crores**
NDP at factor cost – Domestic Income	14900
Income from domestic product accruing to government	(150)
Interest on National debt - Transfer Income	+ 170
Transfer payment by government	+ 60
Net private donation from abroad - Transfer	+ 30
Net factor income from abroad	+ 80
Indirect taxes - Ignore	335
Direct taxes – Personal Income Tax	100 ✓
Subsidies - Ignore	262
Taxes on corporate profits ✓	(222)
Undistributed profits of corporations	(105)

NNP$_{MP}$ = NDP$_{FC}$ + NFIA + Indirect Tax - Subsidy

= 14900 + 80 + 335 - 262

= 15053

Personal Income = 14900 - 150 + 170 + 60 + 30 + 80 - 222 - 105

= 14763

Personal Disposable Income = 14763 - 100

= 14663

H.W.

Eg- Calculate (i) Private Income, (ii) Personal Income & (iii) Personal Disposable Income

	₹
National Income - NNPFC	3000
Savings of private corporate Sector	30
Corporate Tax	80
Current transfers from Govt.	60
Income from property & entrepreneurship to Govt	150
Current transfers from rest of the world	50
Savings of non-departmental govt. sector	40
Net Indirect Taxes	250
Direct taxes paid by household	100
Net factor income from abroad	(10)

1] Private Income

$= 3000 + 60 - 150 + 50 - 40$

$= ₹ 2920$

2] Personal Income $= 2920 - 30 - 80$

$= 2810$

3] Personal Disposal Income $= 2810 - 100$

$= 2710$

8) Personal income excludes:
(a) NFIA
(b) Corporate tax
(c) Personal Tax
(d) Current transfers

9) Total income of households from all sources is known as:
a) personal income
b) private income
c) personal disposable income
d) None of the above

10) Which of the following is added to national income while calculating personal income?
NNPFC
(a) Transfer payments to individuals
(b) Undistributed profits of corporate
(c) Transfer payments made to foreigners
(d) Mixed income of self employed

Circular flow of Income

Production of goods & Services

Firms

Spend/ Expenditure

Factor Income

Consumption of goods/services

Factors/ Inputs

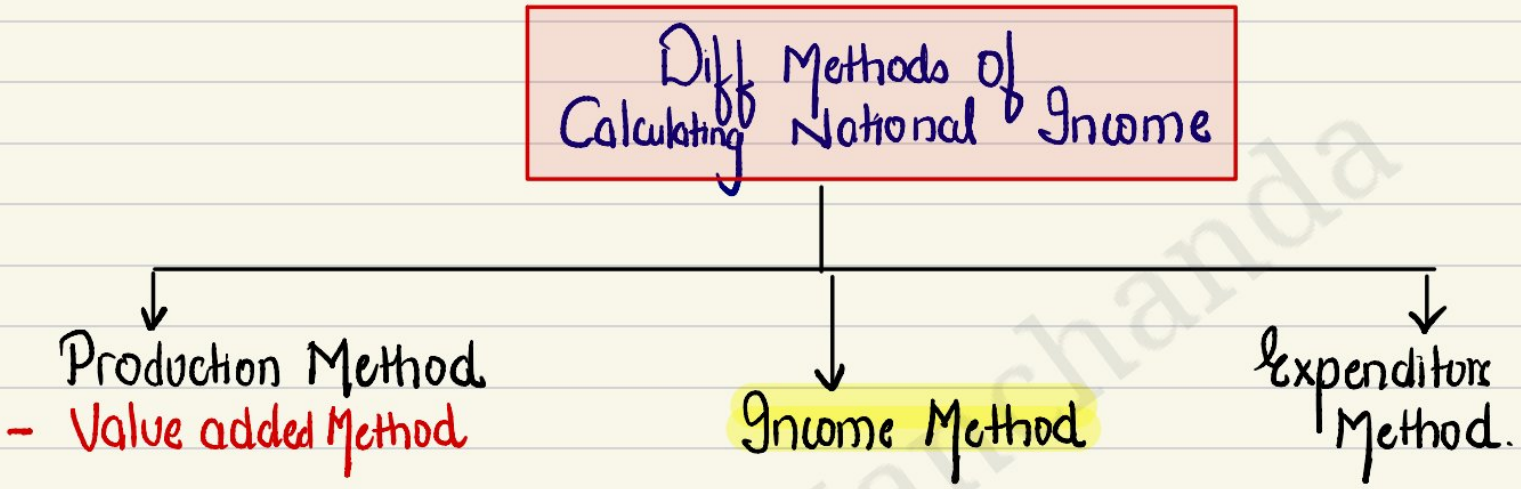
Household

Three different interlinked phases:

1] **Production of Goods & Services**: Firms produce goods & services with the help of factors/ Inputs.

2] **Income or Distribution phase**: Flow of factor incomes in the form of Rent, wages, Int & profit.

3] Expenditure or Disposition phase: Income received by diff. factors of production is spent on consumption of goods & services.



Data requirements and Outcomes of Different Methods of National Income Calculation

Method	Data required	What is measured
Phase of Output: Value added method (Product Method)	The sum of net values added by all the producing enterprises of the country	Contribution of production units
Phase of income: Income Method	Total factor incomes generated in the production of goods and services	Relative contribution of factor owners
Phase of disposition: Expenditure method	Sum of expenditures of the three spending units in the economy, namely, government, consumer households, and producing enterprises	Flow of consumption and investment expenditures

1. Value added Method or Product Method

Step 1 Identify the producing enterprises & classify them into following Sectors :-

a) Primary Sector - Agriculture, extraction of natural resources.
b) Secondary Sector - Factory, Manufacturing
c) Tertiary or Service Sector - Banking, Transport

Step 2: Estimate the Gross value added (GVA$_{MP}$) by each producing enterprise.

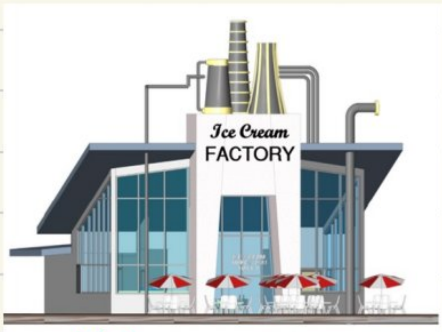
$$GVA_{MP} = \text{Value of Output} - \text{Intermediate Consumption}$$

eg.

Amul
The Taste of India

Total output, 200l@50 - ₹10,000

GVA$_{MP}$ - ₹10,000



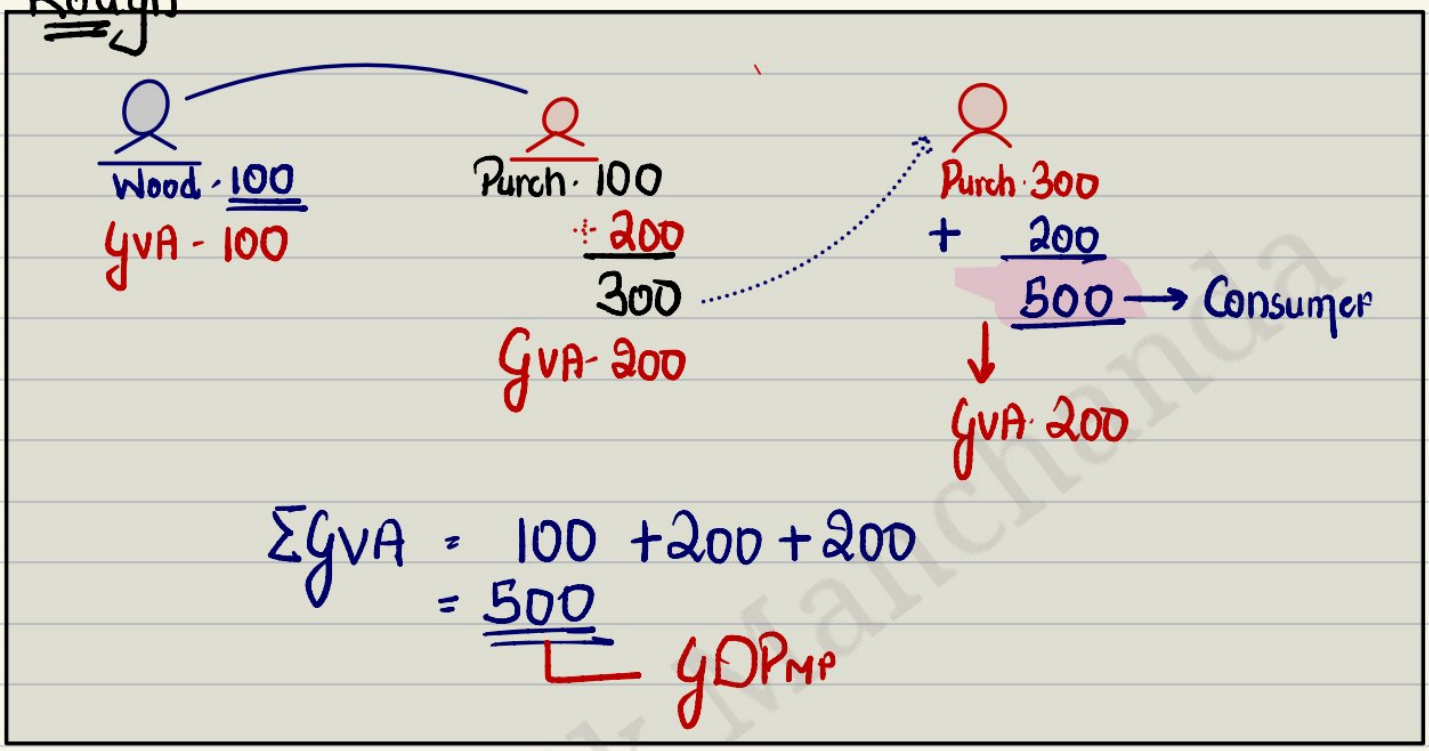
Purchase - 10,000 (Included)

Ice-cream -	₹50,000
(-) Intermediate Consumption	(10,000)
GVA$_{MP}$	40,000

$\Sigma GVA_{MP} = 10,000 + 40,000$

$= ₹50,000$ → $\Sigma GVA_{MP} = GDP_{MP}$

Rough



$\Sigma GVA = 100 + 200 + 200$

$= 500$ ← GDP_{MP}

→ Value of Output - Sales + Change in Stock

↓ Cl. stock - Op Stock

Eg. - Total Sales - ₹100,000
Op Stock - ₹10,000
Cl. Stock - ₹15,000

Value of output - Change in stock

$100,000 - 10,000 + 15000$

$= ₹ 105000$

Step 3: Estimation of National Income

$NNP_{FC} = GDP_{MP} - Dep + NFIA - Net\ Indirect\ Taxes$

ILLUSTRATION 9

Calculate National Income by Value Added Method with the help of following data-

Particulars	***₹ (in Crores)***
Sales	*700*
Opening stock	*500*
Intermediate Consumption	*350*
Closing Stock	*400*
Net Factor Income from Abroad	*30*
Depreciation	*150*
Excise Tax	*110*
Subsidies	*50*

GVA_{MP} = Value of output − Intermediate cons.

GDP_{MP} = [700 − 500 + 400] − 350

= 250

NNP_{FC} = GDP_{MP} − Dep + NFIA − Indirect Tax + Subsidy

= 250 − 150 + 30 − 110 + 50

= ₹70 crores

ILLUSTRATION 11

Calculate national income by value added method.

Particulars	(₹ in crores)
Value of output in primary sector	2000
Intermediate consumption of primary sector	200
Value of output of secondary sector	2800
Intermediate consumption of secondary sector	800
Value of output of tertiary sector	1600
Intermediate consumption of tertiary sector	600
Net factor income from abroad	-30
Net indirect taxes	300
Depreciation	470

$GDP_{MP} = (2000 - 200) + (2800 - 800) + (1600 - 600)$

$= 4800$ (GVA_{MP} - Primary)

$NNP_{FC} = 4800 - 470 - 30 - 300$

$= ₹4000$

ILLUSTRATION 12

Calculate Net Value Added by Factor Cost from the following data

Items	***₹ in Crores***
Purchase of materials	*85*
Sales	*450*
Depreciation	*30*
Opening stock	*40*
Closing stock	*30*
Excise tax	*45*
Intermediate consumption	*200*
Subsidies	*15*

Intermediate cons. Already includes Puchase of Material

$GVA_{MP} = (450 + 30 - 40) - 200$

$= 240$

$NVA_{FC} = GVA_{MP} - Dep - Ind.Tax + Subsidy$

$= 240 - 30 - 45 + 15$

$= ₹\ 180$ Crores.

ILLUSTRATION 10

Rent, Int, Profit

Calculate the Operating Surplus with the help of following data -

Particulars	***₹ in Crores***
Sales	*4000*
Compensation of employees	*800*
Intermediate consumption	*600*
Rent	*400*
Interest	*300*
Net indirect tax	*500*
Consumption of Fixed Capital - Dep	*200*
Mixed Income	*400*

NDP_{FC} = Comp of employees + op Surplus + Mixed Income of Self emp.

→ GDP_{MP} = 4000 - 600
= 3400

NDP_{FC} = 3400 - 200 - 500
= 2700

2700 = 800 + Op Surp + 400
Op Surp = 1300

Homework:

Calculate 'Sales' from the following data :

Particulars	**₹ in Lakhs**
Subsidies	200
Opening stock	100
Closing stock	600
Intermediate consumption	3,000
Consumption of fixed capital (Dep)	700
Profit	750
Net value added at factor cost	2,000

GVAMP = NVAFC + Dep + Indtax - Sub.
= 2000 + 700 + 0 - 200
= 2500

GVAMP
2500 = [Sales + Change in stock] - Interm cons
(Value of output)
2500 = Sales + 600 - 100 - 3000
Sales = ₹5000

2. Income Method → Factor Income Method | Distributed Share Method

↳ Whatever is produced by a producing unit is distributed among factors of production.

NDP_{FC}

└ Sum of factor incomes paid out by all production units within domestic territory of a country.

Income from prop
Income from Entrepren. > └ Compensation of employees
+ operating surplus (Rent + Int + Profit)
+ Mixed income of self employed.

Imp

1. Compensation of employees:
   a. Pension of Retired Workers are not included.
   b. COE includes:
      (i) Wages & Salaries
      (ii) Bonus
      (iii) Dearness Allowance [DA]
      (iv) Commission
      (v) Employers contribution to Provident fund

Rough

Salary - ₹100 ✓

Employees Contribut ← (₹12) 88 ✓ + ₹12 ✓ Cont
PF

Employer

(vi) Imputed value of compensation in kind
└ Estimated

2. Int paid by Govt on public debt - Int on Consumption Loans } Transfer Income, will not be included.

3. Capital gains, windfall profits, transfer incomes & income from sale of second hand goods, not included.
   ↳ However, commission, brokerage will be included.

---

3. Expenditure Method
└ Income Disposal Method

$GDP_{MP} = \Sigma$ Final expenditure
↳ Total amt of spending on goods & services, produced within Domestic territory.

- Household
- Business
- Government
- Foreign Sector

1. Consumption Expenditure :- Total spending on goods & services for final use.

   a) Private final consumption exp: (PFCE)
   └ Total spending by household & non-profit institutions serving household. Ex. food, clothing, education, etc.

→ It also includes the value of Primary goods which are produced for own consumption by households.

→ Land & Residential buildings purchased or constructed by household not part of PFCE
↳ Included in Investments.

b] Govt. final consumption exp.
↳ exp. made by Govt on providing public services such as Defense, education, healthcare, etc.

→ Govt exp on pension, Scholarships, etc should be excluded bcz these are transfer payments

2. Investment

↓

Gross Domestic capital formation → Gross Investment

→ Country's total exp which is not consumed but added to Nations fixed Assets & Stock.

1. Gross Business fixed Investment: Spending on cap goods such as Machinery, equipment

2. Inventory Investment: Change in Inventories
↳ Cl. stock - Op. stock

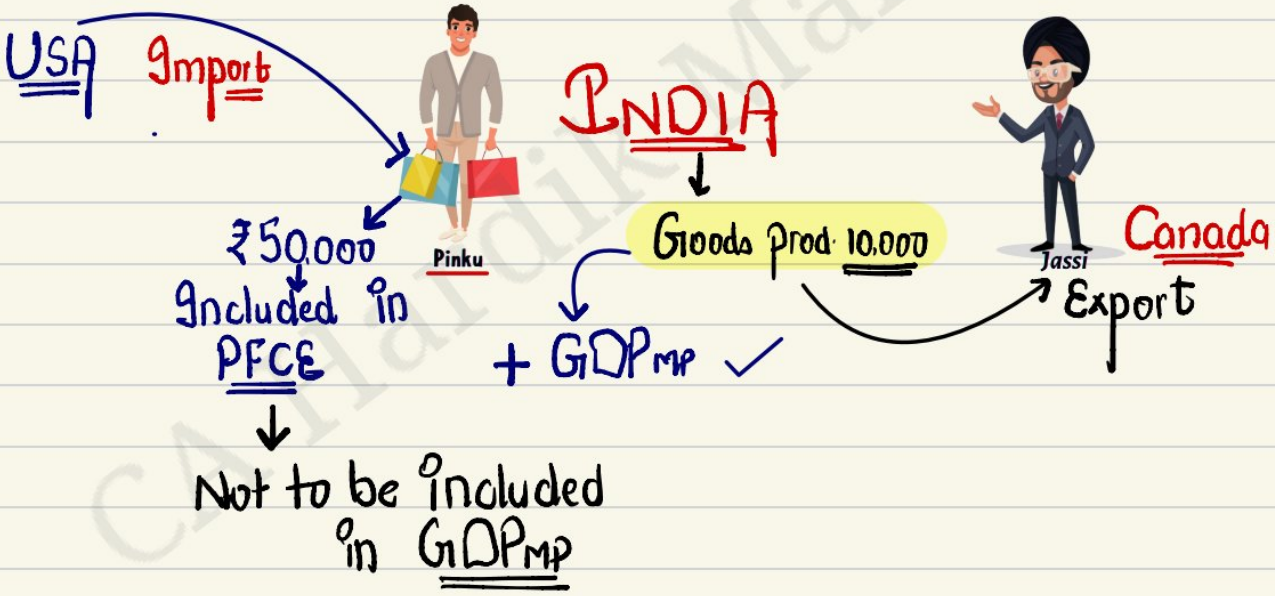
3. Household Inv - Amt spent on building of housing unit, acquisition of valuables.

4. Public Investment - All Inv. by Govt such as roads, hospital, etc.

→ Net Domestic cap formation = Gross Domestic cap formation − Dep (consumption of fixed cap)
Net Investment

3. Net Exports (Export − Import)

Expenditure by forcing entities on domestically Produced goods or Services



GDPMP = Final consumption exp
+ Gross Domestic cap formation
+ Net Exports (Exports − Import)

ILLUSTRATION 13

Calculate NI with the help of Expenditure method and income method with the help of following data: NNP$_{FC}$

Items	₹ in Crores
Compensation of employees	1,200
Net factor income from Abroad	20
Net indirect taxes	120
Profit	800
Private final consumption expenditure	2,000
Net domestic capital formation	770
Consumption of fixed capital	130
Rent	400
Interest	620
Mixed income of self-employed	700
Net export	30
Govt. final consumption expenditure	1100
Operating surplus	1820
Employer's contribution to social security scheme	300

Already Included

Income Method -

NDP$_{FC}$ - 1200 + 1820 + 700

= 3720

National Income = 3720 + 20 = 3740

NNP$_{FC}$

Exp. Method, GDP$_{MP}$ = 2000 + 770 + 130 + 30 + 1100

= 4030

NNP$_{FC}$ = 4030 − 130 + 20 − 120 = 3800

ILLUSTRATION 14

From the following data calculate (a) Gross Domestic Product at Factor Cost, and (b) Gross Domestic Product at Market price

Items	**₹ in Crores**
Gross national product at factor cost	*61,500*
Net exports	*(-) 50*
Compensation of employees	*3000*
Rent	*800*
Interest	*900*
Profit	*1,300*
Net indirect taxes	*300*
Net domestic capital formation	*800*
Gross domestic capital formation	*900*
Factor income to abroad	*80*

100 - Dep

Income Method

NDP_{FC} = 3000 + 800 + 900 + 1300
= ₹6000

GDP_{FC} = NDP_{FC} + Dep
= 6000 + 100
= ₹6100

GDP_{MP} = GDP_{FC} + Ind Tax - Sub
= 6100 + 300
= ₹6400

ILLUSTRATION 15

Calculate NNP_{FC}. By expenditure method with the help of following information -

Items	**₹ in Crores**
Private final consumption expenditure	*10*
Net Import (Export - Imp) (20)	*20*
Public final consumption expenditure	*05*
Gross domestic fixed capital formation	*350*
Depreciation	*30*
Subsidy	*100*
Income paid to abroad	*20*
Change in stock	*30*
Net acquisition of valuables	*10*

$GDP_{MP} = 10 - 20 + 05 + 350 + 30 + 10$
$= 385$

$NNP_{FC} = 385 - 30 - 20 + 100$
$= 435$

Calculate Gross Domestic Product at market Prices (GDP_{MP}) and deriv national income from the following data (in Crores of ₹)

Inventory Investment	+ 100
Exports	+ 200
Indirect taxes	100
Net factor income from abroad	- 50
Personal consumption expenditure	+ 3500
Gross residential construction investment	+ 300
Depreciation	50
Imports	− 100
Government purchases of goods and services	+ 1000
Gross public investment	+ 200
Gross business fixed investment	+ 300

GDP_{MP} = ₹5500

NNP_{FC} = GDP_{MP} - Dep + NFIA - NIT
= 5500 - 50 - 50 - 100
= ₹5300

Find GDP_{MP} and GNP_{MP} from the following data (in Crores of ₹) using income method. Show that it is the same as that obtained by expenditure method.

Personal Consumption	+ 7,314
Depreciation	800
Wages	+ 6,508
Indirect Business Taxes	1,000
Interest	+ 1,060
Domestic Investment	+ 1,442
Government Expenditures	+ 2,196
Rental Income	+ 34
Corporate Profits	+ 682
Exports	+ 1,346
Net Factor Income from Abroad	40
Mixed Income	+ 806
Imports	− 1,408

Income Method -

NDP_{FC} = ₹9090

$GDP_{MP} = NDP_{FC} + Dep + NIT$

$= 9090 + 806 + 1000$

$= 10890$

$GNP_{MP} = GDP_{MP} + NFIA$

$= 10890 + 40$

$= ₹10930$

Expenditure Method

GDP_{MP} - 10890

GNP_{MP} - 10890 + 40

= 10930

Cheating

11) The concept of 'resident unit' involved in the definition of GDP denotes

(a) A business enterprise which belongs to a citizen of India with production units solely situated in India ✗

(b) The unit having predominant economic interest in the economic territory of the country for one year or more irrespective of the nationality or legal status

(c) A citizen household which had been living in India during the accounting year and one whose economic interests are solely in India ✗

(d) Households and business enterprises composed of citizens of India alone living in India during the accounting year ✗

12) Read the following statements and answer the following question.

I. Intermediate consumption consists of the value of the goods and services consumed as inputs by a process of production, ✓

II. Intermediate consumption excludes fixed assets whose consumption is recorded as consumption of fixed capital. ✓

(a) Only I is true

(b) Both I and II are true ✓

(c) Only II is true

(d) Neither I nor II is true

13) Which of the following does not enter into the calculation of national income?

(a) Exchange of previously produced goods

(b) Exchange of second hand goods

(c) Exchange of stocks and bonds

(d) All the above ✓

Raw Mat. 100
+ Process 50 — value add
150 - output

14) Read the following statements

I. 'Value added' refers to the difference between value of output and purchase of intermediate goods. ✓

II. 'Value added' represents the contribution of labour and capital to the production process.

(a) Statements I and II are incorrect

(b) Statements I and II are correct ✓

(c) Statement I is correct and II is incorrect

(d) Statement II is correct and I is incorrect

15) Non-economic activities are

(a) those activities whose value is excluded from national income calculation as it will involve double counting — Intermediate

(b) those which produce goods and services, but since these are not exchanged in a market transaction they do not command any market value

(c) those which do not involve production of goods and services as they are meant to provide hobbies and leisure time activities

(d) those which result in production for self consumption and therefore not included in national income calculation

16) Which of the following enters into the calculation of national income?

(a) The value of the services that accompany the sale ✓

(b) Additions to inventory stocks of final goods and materials ✓ Change in Stock

(c) Stocks and bonds sold during the current year - Financial Trans.

(d) (a) and (b) above

17) National income using the below data is:

1	Personal Income	8000
2	Mixed Income of self employed	+ 2000
3	Compensation of employees	+ 1600
4	Net-factor Income from abroad	- -200
5	Rent	+ 1500
6	Personal Income Taxes	800
7	Profit	+ 1400
8	Consumption of fixed capital	600
9	Direct taxes paid by households	900
10	Non-Tax Payments	1000
11	Net Indirect taxes	700
12	Net Exports Taxes	-180
13	Interest	+ 1100

$NDP_{FC} = 7600$

$NNP_{FC} = 7600 - 200$

$= 7400$

a) 6300

b) 7400

c) 8200

d) None of the above

*

18) Operating Surplus using the below data is:

Particulars	₹ (In Crore)
Sales	4,000
Compensation to employees	800
Intermediate consumption	600
Rent	400
Interest	300
Net indirect taxes	500
Consumption of fixed capital	200
Mixed income	400

a) 800
b) 1500
c) 700
d) 1200

$GDP_{MP} = 4000 - 600$
$= 3400 \rightarrow NDP_{FC} = 3400 - 200 - 500$

$NDP_{FC} = Comp + Op\ Surp + Mixed\ inc.$
$2700 = 800 + op + 400$
$Op\ Surp = 1500$

19) Domestic Income using the below data is:

	Particulars	₹ crore
(i)	Sales by firm B to general government	300
(ii)	Sales by firm A (Total Sales)	1500
(iii)	Sales by firm B to households	1350
(iv)	Change in stock of firm A	200
(v)	Closing stock of firm B	140
(vi)	Opening stock of firm B	130
(vii)	Purchases by firm A	270
(viii)	Indirect taxes paid by both the firms	375
(ix)	Consumption of fixed capital	720
(x)	Sales by firm A to B (Already Incl. in ii)	300

a) 1,995

b) 1,695

c) 1,295

d) None of the above

GDP$_{MP}$

Firm A = value of output − Interm'd consump

↓

Sales + change in stock

= 1500 + 200 − 270

= 1430

Firm B = 1650 + 10 − 300

= 1360

GDP$_{MP}$ = 1430 + 1360 = 2790

NDP$_{FC}$ = 2790 − 720 − 375 = 1695

Which Method is more suitable?

- Ideally, all the three methods of national income computation should arrive at the same figure.
- Each method of measuring GDP is subject to measurement errors and each method provides a check on the accuracy of the other methods.
- By calculating total output in several different ways and then trying to resolve the differences, we will be able to arrive at a more accurate measure than would be possible with one method alone.
- Moreover, different ways of measuring total output give us different insights into the structure of our economy.

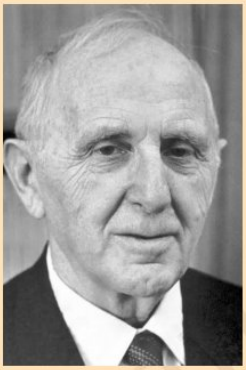
Income method may be most suitable for developed economies where people properly file their income tax returns.
With the growing facility in the use of the commodity flow method of estimating expenditures, an increasing proportion of the national income is being estimated by expenditure method.

Most suitable method for INDIA?

As a matter of fact, countries like India are unable to estimate their national income wholly by one method.
Thus, in the agricultural sector, net value added is estimated by the production method, in the small scale sector net value added is estimated by the income method and in the construction sector net value added is estimated by the expenditure method.

NATIONAL INCOME ACCOUNTING

National Income Accounting, pioneered by the Nobel prize-winning economists Simon Kuznets and Richard Stone



It is the system of macro-economic accounts from the stage of production of goods and services to the stage of their final disposal.

National Accounts help us to understand how the various transactions from the stage of production of goods and services to the stage of their final disposal are interrelated and give us an idea of the working of an economy.

It helps to meet the needs of Government, private analysts, policy makers and decision takers.

The Central Statistical Organisation (CSO) in the Ministry of Statistics and Programme Implementation (MoSP&I) is responsible for the compilation of National accounts statistics.

At the State level, State Directorates of Economics and Statistics (DESs) have the responsibility of compiling their State Domestic Product and other aggregates

CSO central statistical office

सत्यमेव जयते

GOVERNMENT OF INDIA
MINISTRY OF STATISTICS AND PROGRAMME IMPLEMENTATION

THE SYSTEM OF REGIONAL ACCOUNTS IN INDIA

Regional accounts provide an integrated database on the innumerable transactions taking place in the regional economy and help decision making at the regional level.

At present, practically all the states and union territories of India compute state income estimates and district level estimates.

State Income or Net State Domestic Product (NSDP) is a measure in monetary terms of the volume of all goods and services produced in the state within a given period of time (generally a year) accounted without duplication.

Per Capita State Income is obtained by dividing the NSDP (State Income) by the midyear projected population of the state.

In the preparation of state income estimates, certain activities such as railways, communications, banking and insurance and central government administration, that cut across state boundaries, and thus their economic contribution cannot be assigned to any one state directly are known as the 'Supra-regional sectors' of the economy.

The estimates for these supra regional activities are compiled for the economy as a whole and allocated to the states on the basis of relevant indicators.

USEFULNESS AND SIGNIFICANCE OF NATIONAL INCOME ESTIMATES

- Businesses to forecast the future demand for their products.
- The estimates of national income show the composition and structure of national income in terms of different sectors of the economy, the periodical variations in them and the broad sectoral shifts in an economy over time.
- Sectoral contribution to National Income information is used by the government to decide various sector-specific development policies to increase growth rates.
- National income statistics also provide a quantitative basis for macroeconomic modelling and analysis, for assessing and choosing economic policies and for objective statements as well as evaluation of governments' economic policies.
- National income estimates throw light on income distribution and the possible inequality in the distribution among different income categories . It facilitates the process of comparisons of structural statistics, such as ratios of investment to growth , taxes proceeds and fiscal deficit , or government expenditures to GDP.
- International comparisons in respect of incomes and living standards assist in determining eligibility for loans, and/or other funds or conditions under which such loans, and/ or funds are made available.
- Combined with financial and monetary data, national income data provides a guide to make policies for growth and inflation.

GDP & WELFARE

Can the GDP of a country be taken as an index of the welfare of people in that country?

There are many reasons to dispute the validity of GDP as a perfect measure of well-being. In fact, GDP measures our ability to obtain many requirements to make our life better; yet leave out many important aspects which ensure good quality of life for all. GDP measures exclude the following which are critical for the overall wellbeing of citizens:

- Income distributions and, therefore, GDP per capita is a completely inadequate measure of welfare. Countries may have significantly different income distributions and, consequently, different levels of overall well-being for the same level of per capita income.
- Quality improvements in systems and processes due to technological as well as managerial innovations which reflect true growth in output from year to year.
- Productions hidden from government authorities, either because those engaged in it are evading taxes or because it is illegal (drugs, gambling etc.).
- Non market production and Non-economic contributors to well-being for example: health of a country's citizens, education levels, political participation, or other social and political factors that may significantly affect well- being levels.
- The disutility of loss of leisure time. We know that, other things remaining the same, a country's GDP rises if the total hours of work increase.

Total hours of work ↑ - GDP ↑
Leisure time ↓ · Welfare ↓

- Economic 'bads' for example: crime, pollution, traffic congestion etc which make us worse off.

- The volunteer work and services rendered without remuneration undertaken in the economy, even though such work can contribute to social well-being as much as paid work.

- Many things that contribute to our economic welfare such as, leisure time, fairness, gender equality, security of community feeling etc.,

- Both positive and negative externalities which are external effects that do not form part of market transactions

- The distinction between production that makes us better off and production that only prevents us from becoming worse off, for e.g. defence expenditures such as on police protection. Increased expenditure on police due to increase in crimes may increase GDP but these expenses only prevent us from becoming worse off. However, no reflection is made in national income of the negative impacts of higher crime rates. As another example, automobile accidents result in production of repairs, output of medical services, insurance, and legal services all of which are production included in GDP just as any other production.

LIMITATIONS AND CHALLENGES OF NATIONAL INCOME COMPUTATION

There are innumerable limitations and challenges in the computation of national income. The task is more complex in underdeveloped and developing countries. Following are the general dilemmas in measurement of national income.

There are many conceptual difficulties related to measurement which are difficult to resolve, such as:

(a) lack of an agreed definition of national income,
(b) accurate distinction between final goods and intermediate goods,
(c) issue of transfer payments,
(d) services of durable goods,
(e) difficulty of incorporating distribution of income,
(f) valuation of a new good at constant prices, and
(g) valuation of government services

Other challenges relate to:

(a) Inadequacy of data and lack of reliability of available data,
(b) presence of non-monetised sector,
(c) production for self-consumption,
(d) absence of recording of incomes due to illiteracy and ignorance,
(e) lack of proper occupational classification, and
(f) accurate estimation of consumption of fixed capital

Unit over.

The Keynesian Theory of Determination of National Income

→ The concept of `Ex post` & 'Ex-ante'

`Ex post`
- The actual value.
- Realised values.
- → The goods & services actually produced & consumed
- ↓ Discussed in unit 1

'Ex-ante'
- The planned or intended value.
- Anticipated values.
- → Goods & services planned to produce & consumed
- ↓ will be discussed in this unit.

→ Story of the THE GREAT DEPRESSION of 1930s

↓ Greatest economic crisis the western world had experienced.

* Classical economist had no developed theory to explain persistent unemployment & no solution.
* Many economist recommended Govt spending to reduce unemployment

↓ But had no Macro economic theory to justify their recommendation.

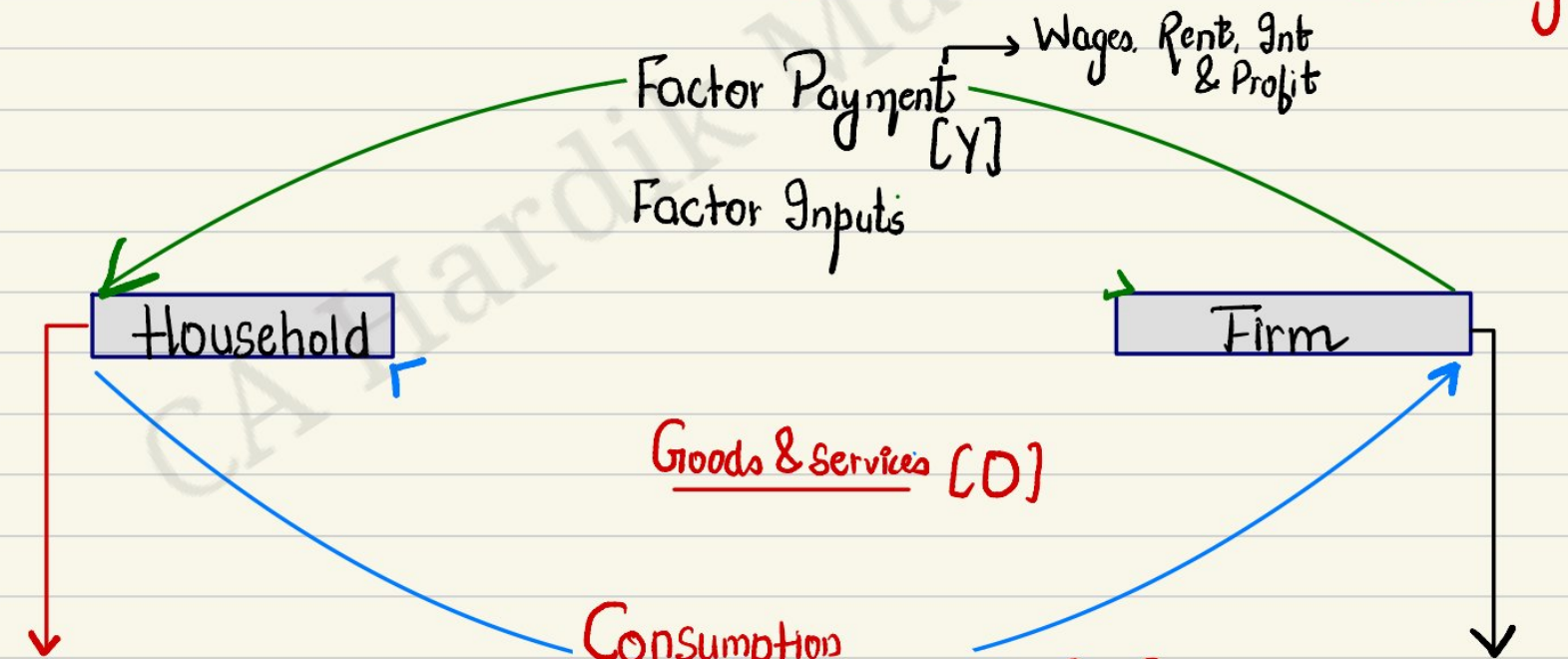
→ Macro economics was revolutionised in 1936 with the publication of John Maynard Keynes general theory of Employment, Interest & Money.

→ The Keynesian Theory of Income Determination is presented in three models :-

(i) Two-Sector Model - Household & business sector
(ii) Three-Sector Model - Household, business sector & Goverment
(iii) Four-Sector Model - Household, business sector, Goverment & foreign sector.

→ Circular flow in 2-Sector Model

↳ How money moves through Society / within an economy



1. Own all the factors of production.
2. Sell their services to earn factor income
3. Income is entirely spent on goods & services i.e No Savings

1. Assumed to hire factors of prod. from Household.
2. Produce & Sell goods & Services to Household.
3. No corporate tax or retained earnings.

→ The total income produced [Y] accrues to Household & is equal to the disposable personal income.

$$Y = Y_d$$

↳ Disposable income.

* Real & Money flow

1. Circular broken line shows factor & product flow — Real Flow
2. Continuous line shows 'MONEY FLOW' which are generated by Real flows.

→ Since, whole of household income is spent on goods & services produced by the firm.

Factor Payments	= Household income	= Household expenditure	= Total Receipts of firm	= Value of Output

* Meaning of equilibrium :

↳ State in which there is no tendency to change - position of rest.

→ Output is at equilibrium level when the Qty of output produced = Qty Demanded

→ Economy is at equilibrium when,

Production plans of firms = Expenditure plans of the household

Production plans of firms → Ex-ante values

Expenditure plans of the household → Demand

* Basic concepts used in Theory of Income Determination.

1. Aggregate Demand function [AD]

↳ AD is what Economist called Planned Expenditure.

Ex-ante AD for final goods / services or Aggregate Expenditure.

→ Consist of 2 components :-

1. Ex-ante aggregate demand for Consumer Goods [C]
2. Ex-ante aggregate demand for Investment Goods [I]

$$AD = C + I$$

↓

accounts for highest proportion of GDP.

→ Here, Investment [I] is assumed to be determined Exogenously & Constant in Short run.

Exogenously ↓ Externaly ↓ not influenced by Income - Influenced by external factors.

Constant → Remains the same.

Short Run, AD function:

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

$\overline{I}$ → Constant Investment

→ We can conclude that in the Short Run, AD depends largely on the Aggregate consumption expenditure

Consumption Function

Relationship b/w dependent & independent variable

→ functional relationship b/w aggregate consumption exp. & aggregate disposable income.

$$C = f(Y)$$

- C: Dependent variable.
- Y: Independent variable
- Consumption changes with change in Income.

Imp

1. Even when there is no income, Consumption exp exists, for basic necessities.
   - Households either borrow or use their savings.
   - Dis-saving

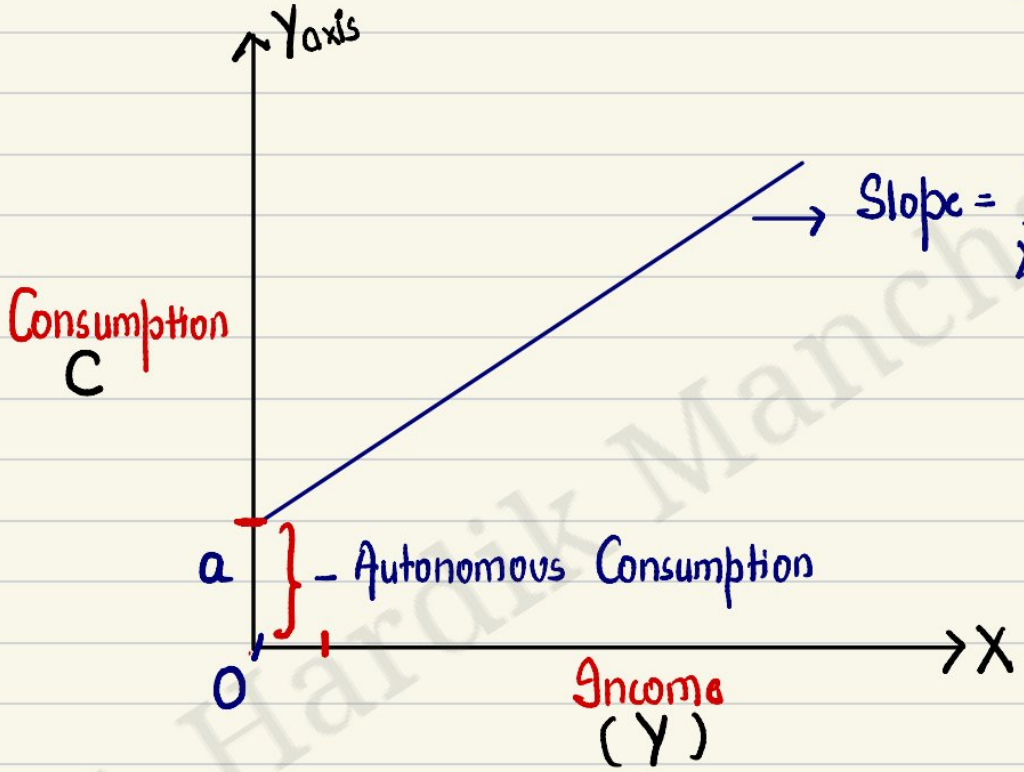
   → Such consumption exp. is called Autonomous Consumption.

2. When $Y\uparrow$ → Consumer will increase their Consumption exp - $C\uparrow$, but only by less than increase in Income

$$Y\uparrow > C\uparrow$$

Consumption function ⇒ $C = a + bY$

- b → Slope
- Y → Income
- a → Autonomous Consumption
  - Dis-saving
  - ↳ value of consumption at zero level of disposable income



MPC

$$\text{Slope} = \frac{Y_2 - Y_1}{X_2 - X_1} = \frac{\Delta Y}{\Delta X} = \frac{\Delta C}{\Delta Y}$$

ΔY → Income

b = Marginal Propensity to Consume [MPC]

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

eg.

Income (Y)	Consumption (C)
500	200
1500	500

$$\frac{\Delta C}{\Delta Y} = \frac{300}{1000} = 0.3$$

Increase in consumption per unit increase in Income

→ The consumption function shows the consumption corresponding to each level of disposable income. (C)

Eg- Autonomous Consumption = 50
MPC = 0.45
Calculate Consumption exp at income level of ₹800.

$C = a + bY$
$= 50 + 0.45 \times 800$
$C = ₹410$

Eg-	Income	Consumption	MPC
	0	200	–
	500	400	$\frac{\Delta C}{\Delta Y} = \frac{200}{500} = 0.4$

* Keynes Assumption:

→ $0 < MPC < 1$ → $\Delta C < \Delta Y$

→ Relationship b/w Income & Consumption.

↓

Average Propensity to Consume (APC)

$= \frac{C}{Y}$ - $\frac{\text{Total consumption}}{\text{Total Income}}$

Eg.- Income	Consumption	MPC	APC
100	70	—	$\frac{70}{100} = 0.7$
220	130	$\frac{60}{120} = 0.5$	$\frac{130}{220}, 0.59$

Savings = Y − C

= 220 − 130 = 90

$Y = C + S$

Eg- $C = 50 + 0.75Y$

Income [Y]	Consumption	APC	MPC	Savings
0	50	∞	—	(50)
100	125	1.25	$\frac{75}{100} = 0.75$	(25)
200	200	1	$\frac{75}{100} = 0.75$	0
300	275	0.92	0.75	25
400	350	0.88	0.75	50

→ Proportion of Income spent on consumption decreases as Income increases

↓

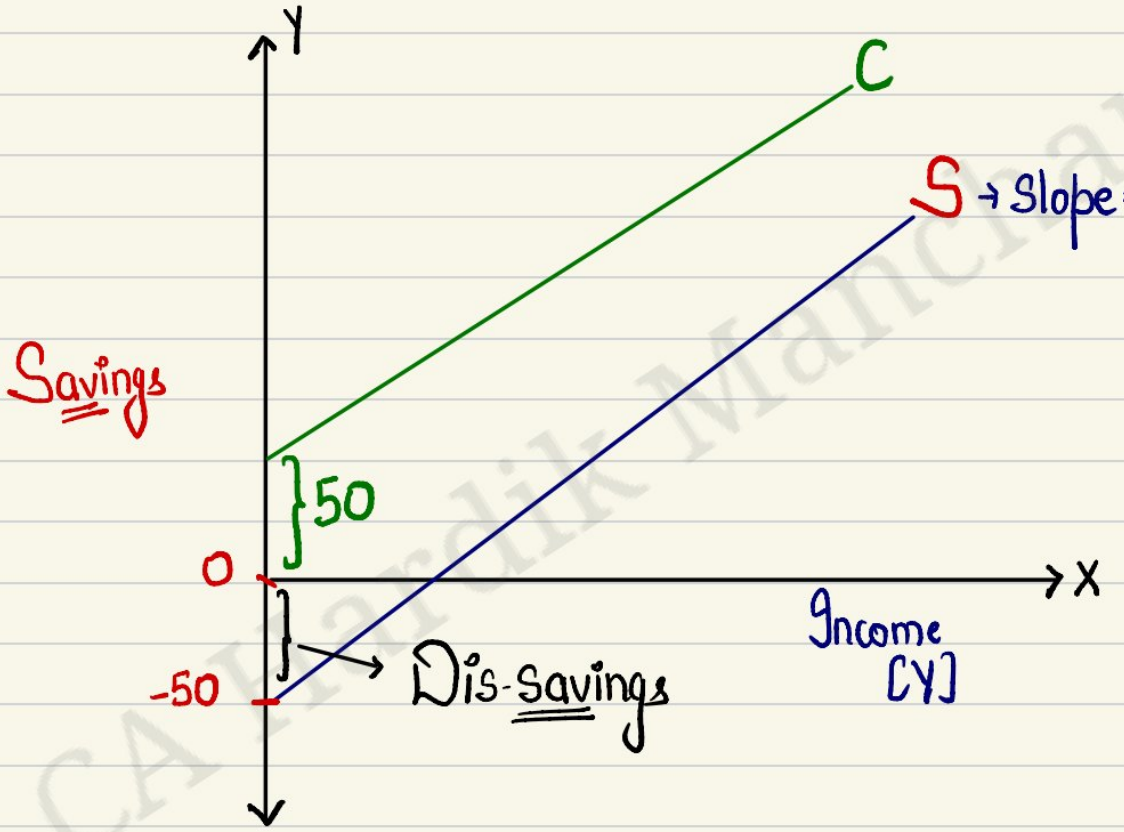
Proportion of Income is saved as income increases.

→ Relationship b/w Income, Consumption & Savings

* Savings is also function of Disposable Income

$$S = f(Y)$$

$Y \uparrow \rightarrow S \uparrow$



Eg.	Y	C	S	MPC	MPS
	0	50	(50)	-	$\frac{\Delta S}{\Delta Y}$
	150	90	60	$\frac{\Delta C}{\Delta Y} = \frac{40}{150} = 0.27$	$= \frac{110}{150} = 0.73$

MPS - Marginal Propensity to Save - change in Savings per unit change in Income.

→ Average Propensity to Save (APS)

$$APS = \frac{\text{Total Savings}}{\text{Total Income}} = \frac{S}{Y}$$

→ $APC = \frac{\text{Total consumption}}{\text{Total Income}} = \frac{C}{Y}$

$APS = \frac{\text{Total Savings}}{\text{Total Income}} = \frac{S}{Y}$

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

$$= \frac{C+S}{Y} = \frac{Y}{Y} = 1$$

→ $\boxed{APC + APS = 1}$

* $MPC + MPS$

$$\downarrow$$

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

$$= \frac{\Delta Y}{\Delta Y} = 1$$

→ $MPC + MPS = 1$

$b + MPS = 1$

$\boxed{MPS = 1 - b}$

MPS = 1 − b → If one unit increase in disposable income leads to an increase of 'b' units, the remaining (1 − b) is the increase in savings.

* Saving function. (from consumption function)

$$C = a + bY \checkmark$$
$$= 20 + 0.6Y$$

$$S = -20 + (1-b)Y$$

↓ Dissaving

$$= -20 + 0.4Y$$

$$\boxed{S = -a + (1-b)Y}$$

Eg- If autonomous consumption is ₹2000 & MPC = 0.8. Calculate total savings at income level of ₹20,000. ✓

$$S = -2000 + 0.2 \times 20{,}000$$
$$= ₹2000$$

Eg- If the consumption function is, $C = 10 + 0.7Y$, then increase in disposable income by ₹200 will result in increase in savings by ____ ?

$\Delta Y = 200$, MPC = 0.7

$\Delta C = 0.7 \times 200$

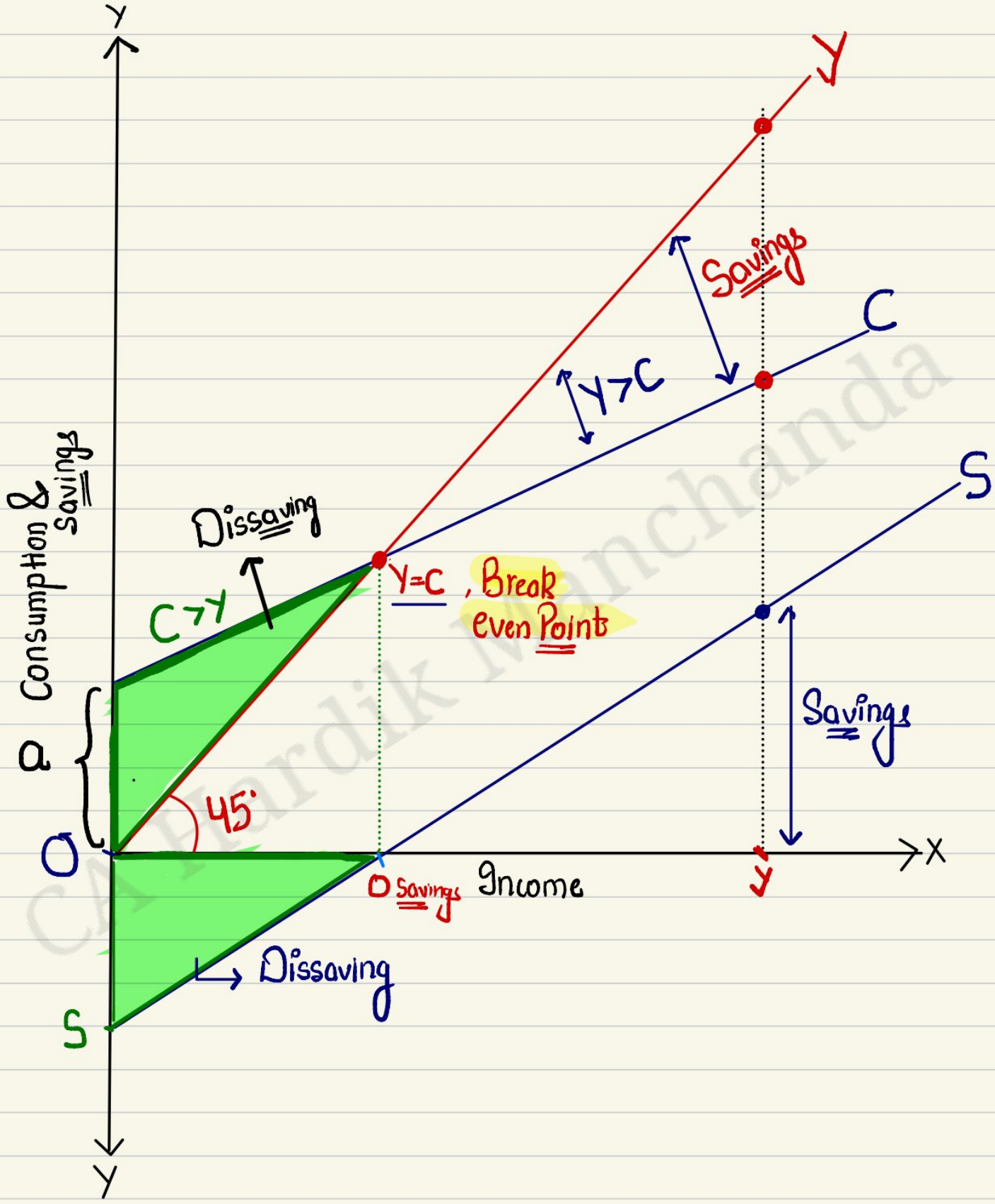
$= 140$

→ MPS = 0.3

$\Delta S = 0.3 \times 200$

$= ₹60$

Income (Y)	C	S
0	20	(20)
60	70	(10)
120	120	0
180	170	10
240	220	20


Y
Y
Savings
C
Y>C
S
Consumption & Savings
Dissaving
C>Y
Y=C, Break even Point
a
Savings
45°
O
X
O Savings
Income
Y
Dissaving
S
Y

At Break even point,

$Y = C$

$\frac{C}{Y}$ ← APC = 1, so, APS = 0 → Zero Savings

Imp:

1. Saving is an Incremental function of Income.
   - APS keeps on increasing

2. Consumption is a decreasing function of Income
   - APC keeps on decreasing

Aggregate Supply: Planned (Ex-Ante) aggregate supply is the total supply of goods & services which firms are planning to sell during a specific time period.

Total value of goods & services produced = Factor Income

↓

Total output

↓

Every unit of goods produced generate income for household.

$$AS = \text{National Income}$$

↓

Which is either Consumed or Saved

$= C + S$

$$\Rightarrow \boxed{AS = Y \Rightarrow C + S}$$

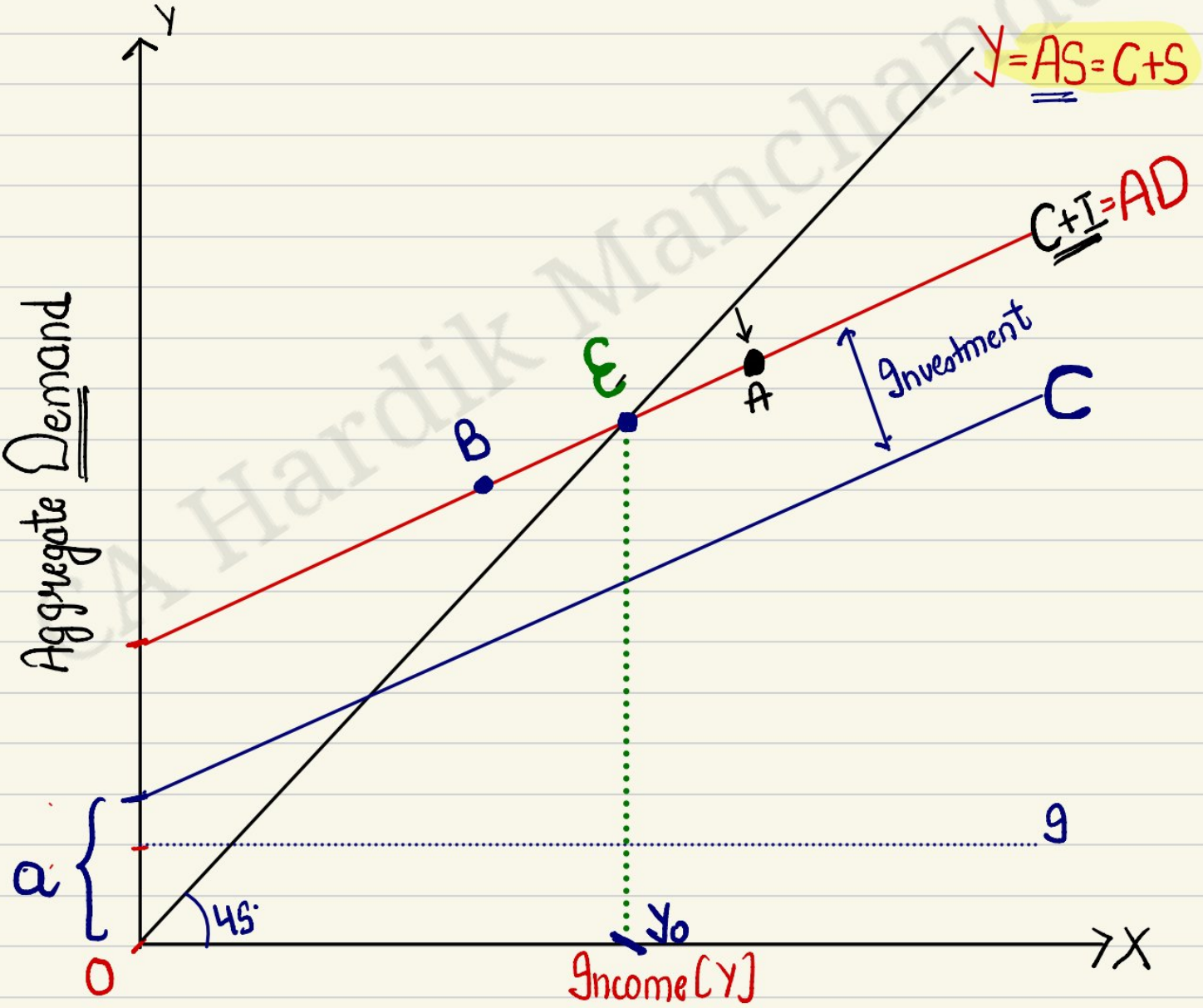
→ Equilibrium in 2-Sector Model.

$$AD = AS$$

Planned Exp = Planned production

Equilibrium → $C+I = C+S$

$$I = S$$



a] Consumption line is positively sloped since cons. increases as income increases but less than increase in income.
→ It is flatter than 45 degree line.

b] Investment exp [I] is exogenous i.e does not vary with change in income. It is constant

c] AD line (Aggregate exp line) is linear & positively sloped indicating that as the level of national income rises, the AD in the economy also rises

* Point below 45 degree line: (AS)
[A]
AS > AD
GDP - Output > Planned exp.

* Point above 45 degree line
[B]
AD > AS
Planned exp > GDP

→ Only at Point E & at corresponding equilibrium level of income & output Y_0, does aggregate demand exactly equals to output
↳ Planned spending precisely matches Production.

* We know that,

$$AD = C + I$$
$$AS = C + S$$

At equilibrium,

$$AD = AS$$
$$C + I = C + S$$
$$I = S$$

Investment = Savings

Imp points according to Keynes:

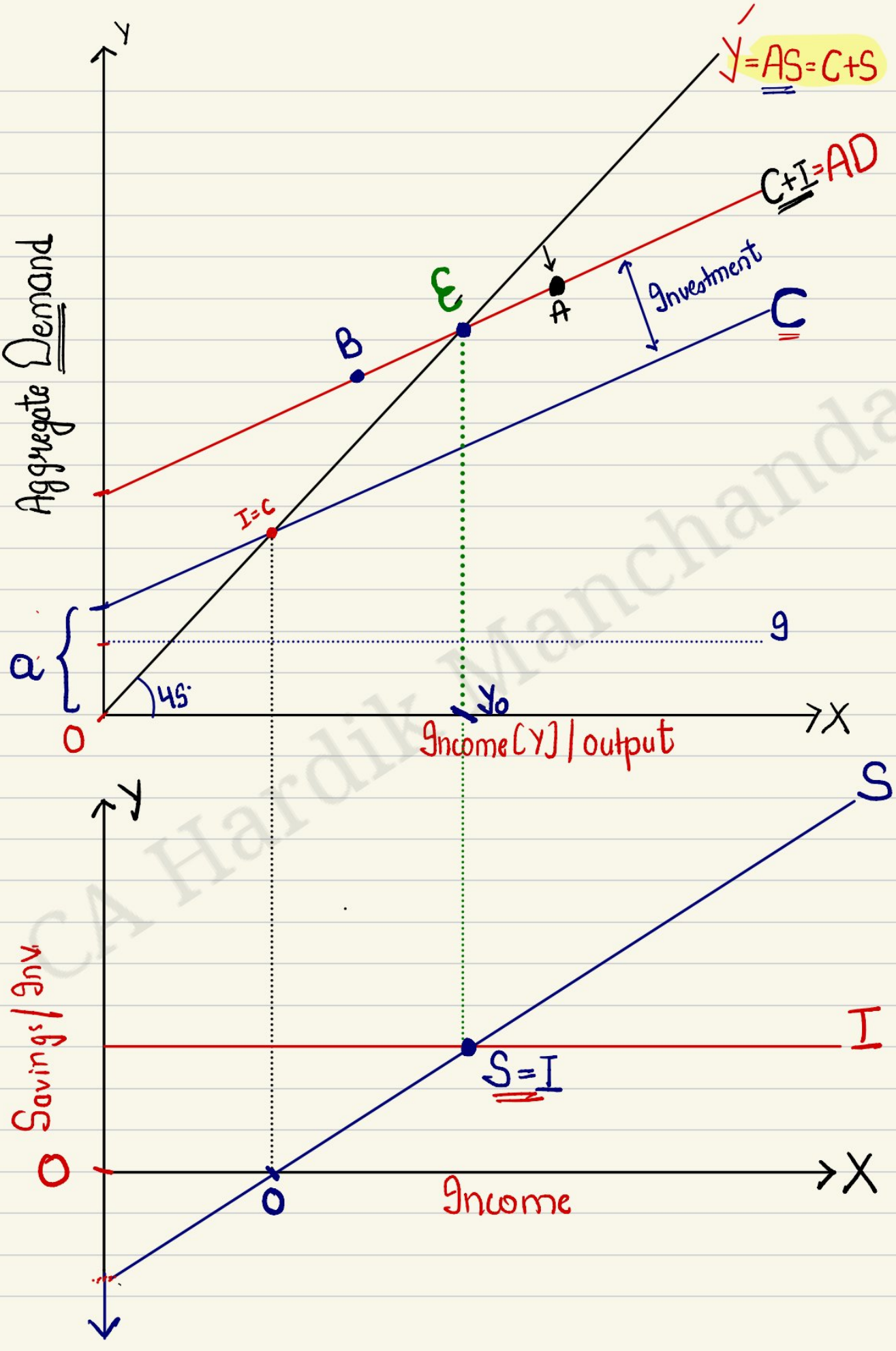
1] AD will not always be equal to Aggregate Supply.

There is no reason to believe that:

a] Consumers consumption plan always coincide with producers production plan.

b] The producers plan to invest matches always with households plan to save.

→ For equilibrium, the household plan must coincide with producers plan.



* Leakages & Injection

↓

Outflow of Income from circular flow of model.

↳ Inflow of Income to the circular flow.

↓

Investment

→ That part of Income which is not used to purchase goods & Services.

↓

Savings

Eg.

	Y	C	S (Leakage)	=	Investment (Injection)
1.	1000	900	100		100
2.	1000	800	200		200

At equilibrium, **Leakage = Injections**

If, Leakage > Injections.
Savings > Investment, National Income will fall.

If, Leakage < Injections.
Savings < Investment, National will rise.

→ Classical economist v/s Keynesian Theory

↓

1) Economy is Self-regulating
2) Capable of achieving equilibrium at the Natural level of GDP

↓

Level of GDP that is obtained when economy's natural resources are fully employed

↓

Market would not automatically lead to full-employment equilibrium & the resulting Natural level of real GDP

↓

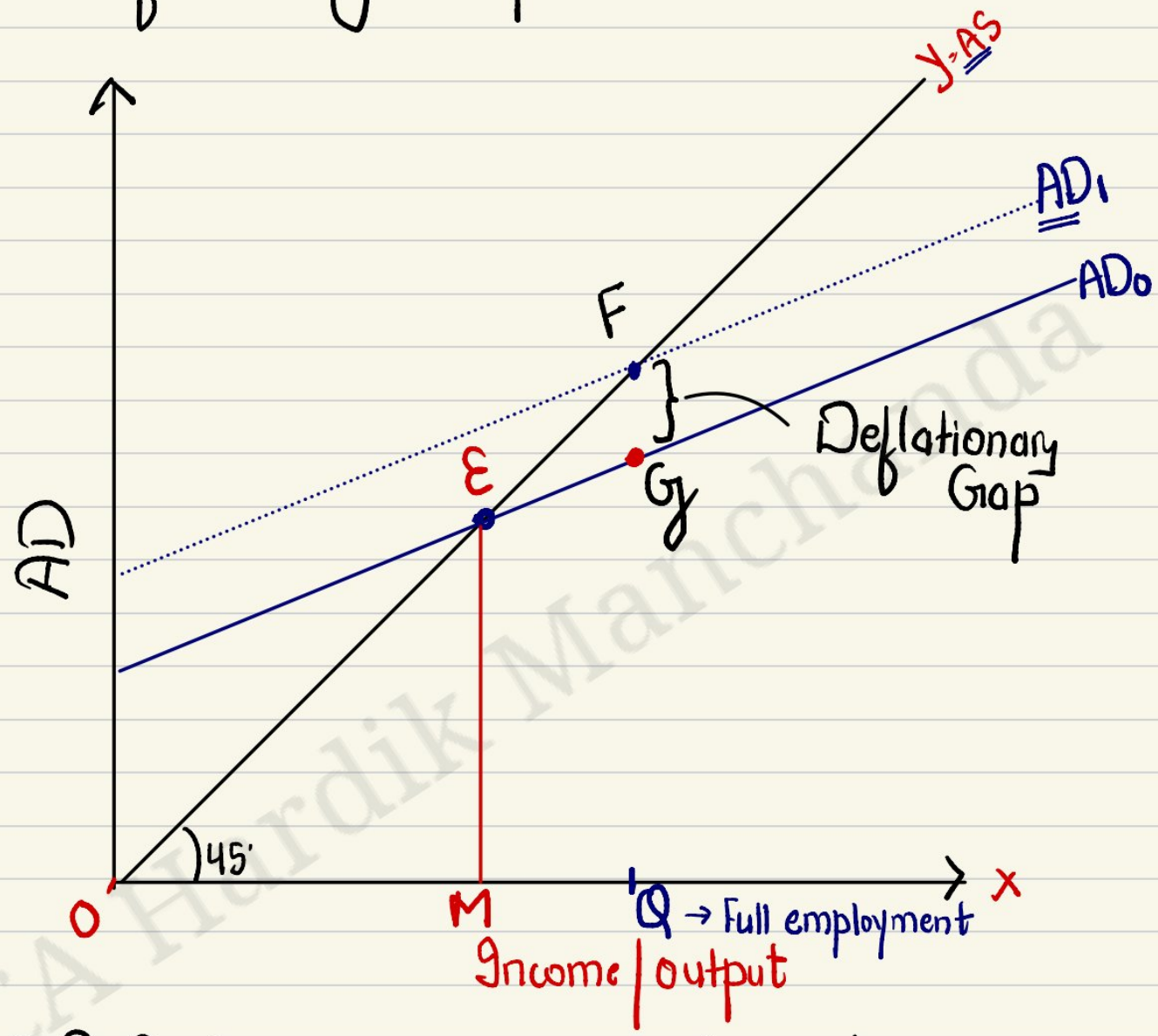
Economy could settle in equilibrium at any level of unemployment

---

* If the aggregate exp [AD] line intersects the 45° line [AS] at the level of potential GDP, then there is full employment equilibrium!

↳ But there is no guarantee that equilib. will occur at potential GDP level of output.

(i) Deflationary Gap



→ OQ is the full employment level of output, where AD = QF.

but, At AD = GQ, there is deficient demand.

Deflationary Gap = FG

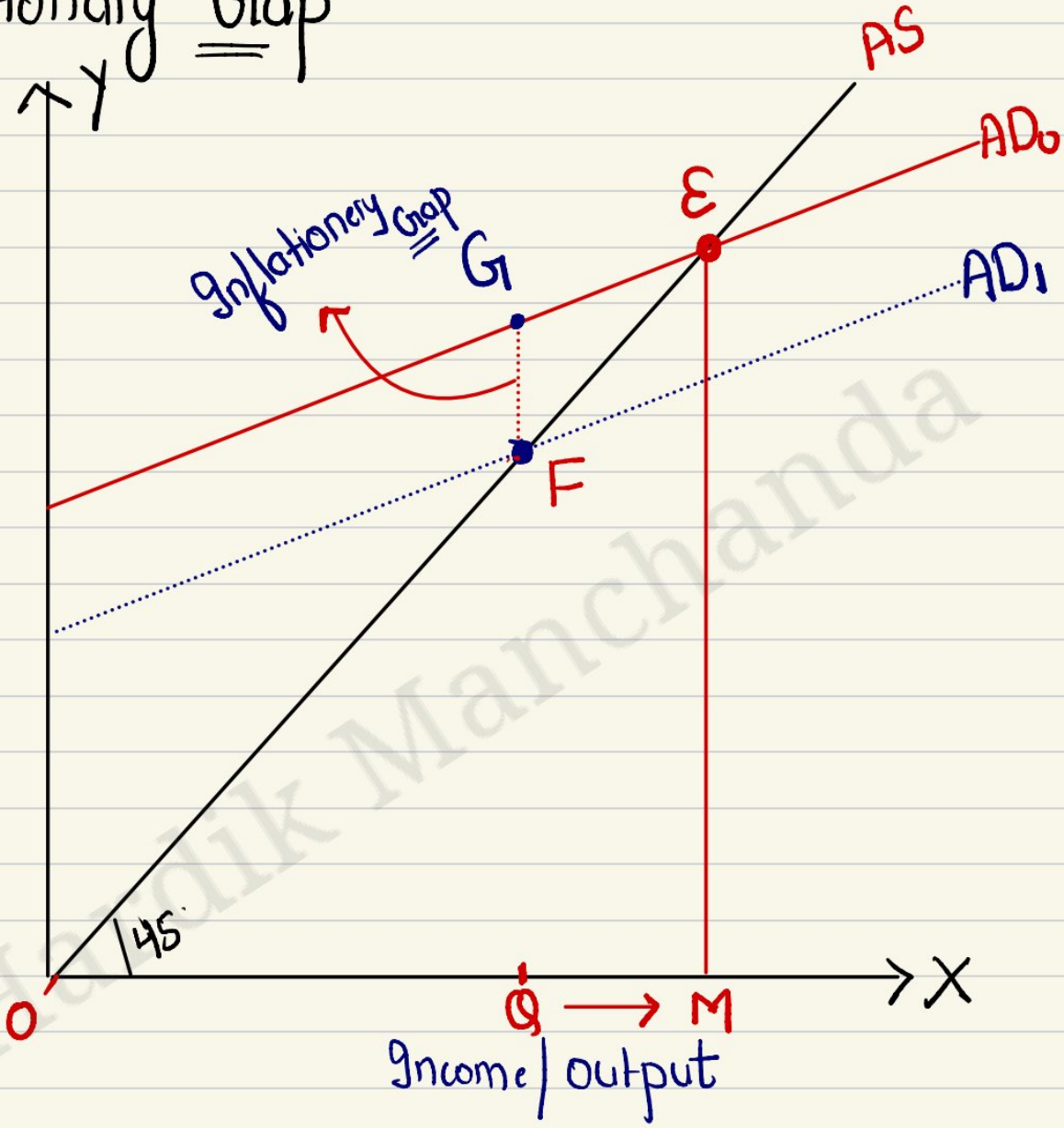
↓

Unplanned build up of Inventories
↓
Production ↓
↓
Employment ↓
↓
Income ↓

→ If AD is for an amount of output less than the full employment level output, the we say there is a deficient demand.
↓
Gives rise to deflationary gap or Recessionary gap
↳ Also known as 'Contractionary gap'

* It occurs when economy is in business cycle - Contraction or Recession.

(ii) Inflationary Gap



→ Economy at full employment equilibrium at F. when OQ is the level of output & income. & AD = FQ

but, When AD = GQ, then there is excess demand, resulting in Inflationary gap = FG

→ The real Output will be constant, but rise in price level will cause increase in nominal output & equilibrium will be at E.

Prices ↑ ⟶ Nominal Output ↑

→ At new equilibrium, Real Output, real Income & employment will be the same.

In the Keynesian Model,

Neither wages nor interest rates will decline in the face of abnormally unemployment & excess capacity.

↓

Output will remain at less than full employment rate as long as there is insufficient spending in the economy.

ILLUSTRATION 2

Calculate marginal propensity to consume and marginal propensity to save from the following data about an economy which is in equilibrium:

National income = 2500, Autonomous consumption expenditure = 300, Investment expenditure = 100

$$AD = AS$$

$Y = 2500 = C + S$

$a = 300$

$I = 100 = S$

$$Y = C + S$$

$$2500 = C + 100$$

$$C = 2400$$

$$C = a + bY$$

$$2400 = 300 + b2500$$

$$2100 = b \times 2500$$

$$\Rightarrow \quad b = \frac{2100}{2500} = 0.84$$

$MPC = 0.84$

$MPS = 1 - b$

$= 1 - 0.84 = \underline{0.16}$

ILLUSTRATION 3

An economy is in equilibrium. Calculate national income from the following-

Autonomous consumption = 100; Marginal propensity to save= 0.2; Investment expenditure= 200

$a = 100$ $\quad$ $MPS = 0.2$ $\quad$ $I = 200$

$-a = -100$ $\quad$ $MPC = 0.8$ $\quad$ $S = 200$

$$S = -a + MPS \times Y$$

$$200 = -100 + 0.2Y$$

$$\frac{300}{0.2} = Y$$

$$Y = 1500$$

ILLUSTRATION 4

Suppose the consumption of an economy is given by C = 20+ 0.6 Y and investment I= 10+ 0.2 Y. What will be the equilibrium level of National Income?

$C = 20 + 0.6Y \quad , \quad I = 10 + 0.2Y$

$Y = C + I$

$AS = AD$

$Y = 20 + 0.6Y + 10 + 0.2Y$

$Y = 30 + 0.8Y$

$0.2Y = 30$

$\Rightarrow Y = 150$

ILLUSTRATION 5

Suppose the consumption function C= 7+ 0.5Y, Investment is ₹ 100, Find out equilibrium level of Income, consumption and saving?

$C = 7 + 0.5Y \quad , \quad I = 100$

$S = 100$ ✓

$Y = C + S$

$Y = 7 + 0.5Y + 100$

$0.5Y = 107$

$Y = 214$

$C = 7 + 0.5 \times 214$

$= 114$

ILLUSTRATION 6

If the consumption function is C= 250 + 0.80 Y and I = 300. Find out equilibrium level of Y, C and S?

$C = 250 + 0.8Y$, $I = 300$

$S = 300$

$Y = C + S$

$Y = 250 + 0.8Y + 300$

$0.2Y = 550$

$Y = 2750$

$C = 250 + 0.8 \times 2750$

$= 2450$

ILLUSTRATION 7

If saving function S = -10 + 0.2Y and autonomous investment I = 50 Crores. Find out the equilibrium level of income, consumption and if investment increases permanently by ₹5 Crores, what will be the new level of income and consumption?

$S = -10 + 0.2Y$, $I = 50$

$S = 50$

$50 = -10 + 0.2Y$

$60 = 0.2Y$

$Y = 300$

$C = a + bY$

$= 10 + 0.8 \times 300$

$= 250$

$I = 55 \rightarrow S = 55$

$55 = -10 + 0.2Y$

$65 = 0.2Y$

$Y = 325$

$Y = C + S$

$325 = C + 55$

$C = 270$

ILLUSTRATION 8

Given the empirical consumption function C= 100+0.75Y and I = 1000, calculate equilibrium level of national income. What would be the consumption expenditure at equilibrium level national income?

$C = 100 + 0.75Y$. $I = 1000$

$S = 1000$

$Y = C + S$

$Y = 100 + 0.75Y + 1000$

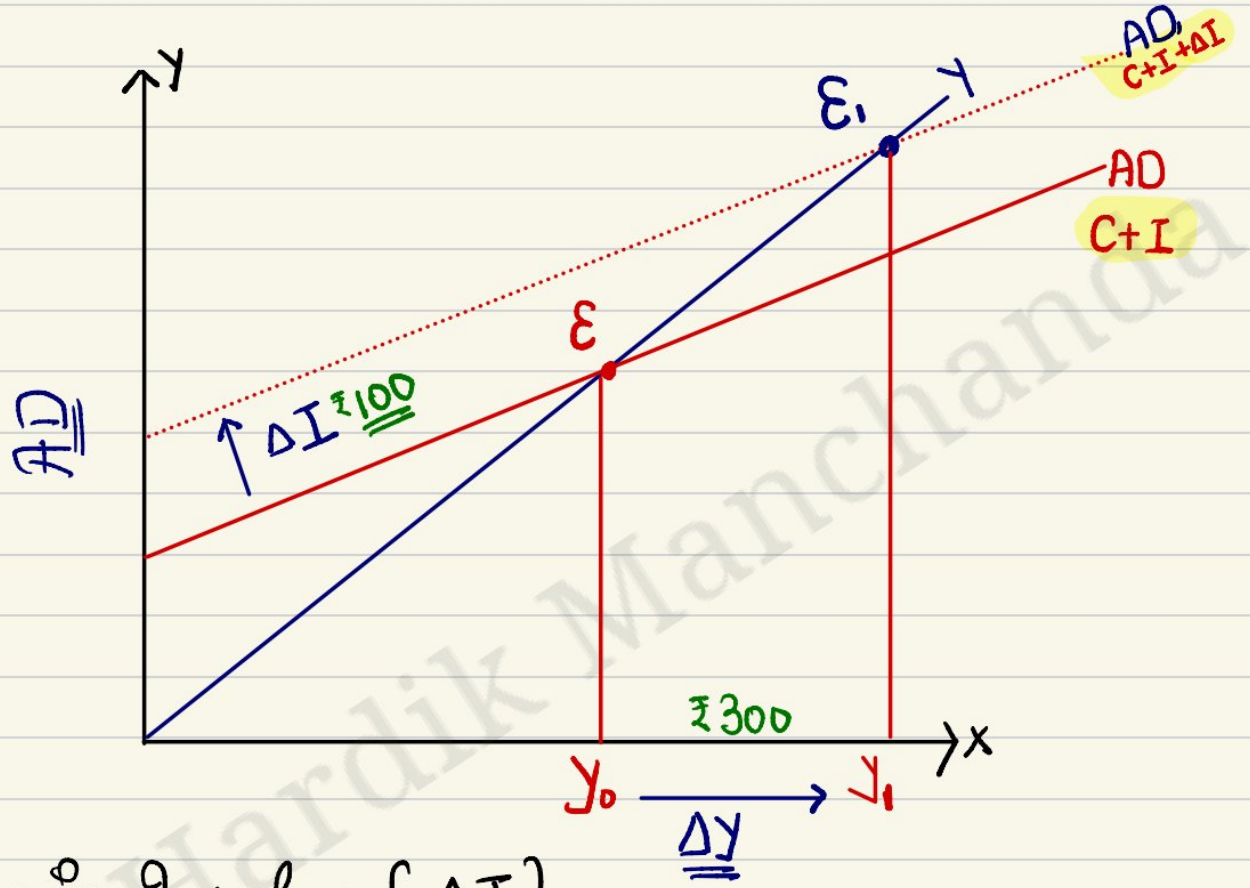
$0.25Y = 1100$

$Y = 4400$

$C = 100 + 0.75 \times 4400$

$C = 3400$

Investment Multiplier



→ Inc. in Inv. Exp [ΔI] leads to proportionately larger change in the equilibrium level of Income [ΔY]

$$\Delta Y > \Delta I$$

* The Inv. Multiplier explains, how many times the income increases as a result of increase in Investment

Eg- If $\Delta I = ₹500$, causes change in national income by ₹3000,

$$\text{Multiplier} = \frac{3000}{500} = 6$$

$$K = \frac{\Delta Y}{\Delta I}$$

Multiplier indicates change in equilibrium income for each rupee change in autonomous investment.

Let us understand how this works:

MPC = 0.8

Purchased capital goods of ₹5000

↓ ΔI = 5000

→ Y↑5000

Spent ₹4000 on consumption of goods & serv.

Y↑4000

Spent ₹3200 on goods & services

Y↑3200

MPC = 0.8
MPS = 0.2

0.8

ΔI	ΔY	ΔC	ΔS
5000	5000	4000	1000
	4000	3200	800
	3200	2560	640

5000 → ?

5000

At equilibrium,

$I = S$

$5000 = \Delta Y \times MPS$

$5000 = \Delta Y \times 0.2$

$\frac{5000}{0.2} = \Delta Y$

$\Delta Y = 25000$

$k = \frac{\Delta Y}{\Delta I} = \frac{25000}{5000} = 5$

$K = \frac{\Delta Y}{\Delta Y \times MPS} = \boxed{\frac{1}{MPS}} = \boxed{\frac{1}{1-MPC}}$

* MPC is the determinant of the value of Multiplier.

Eg. 1) $\Delta I = ₹100$, $MPC = 1$, $MPS = 0$

$K = \frac{1}{0} = \infty$, Max value of Multiplier $= \infty$

2) $\Delta I = 100$, $MPC = 0$, $MPS = 1$

$K \Rightarrow \frac{1}{1}, 1$

* Direct relationship b/w MPC & Multiplier
  - Higher the MPC, higher the K.
* Inverse relationship b/w MPS & Multiplier.

→ Multiplier Shows how Shocks (unexpected change) to one Sector are transmitted throughout economy.

Multiplier & Leakage

→ Income that is not spent on consumption of goods & services - Leakage
  └ reduces the effect of Multiplier.

Causes of Leakage:

1. Progressive rate of taxation.
   └ More income more taxes, less consumption.
2. High liquidity preference - Low MPC
   ↓
   holding of cash balance
3. Increased demand for consumer goods, met out of existing stock or through imports
4. Additional income spent on purchasing existing wealth or purchase of shares & securities.
5. Undistributed profits of corporations.
6. Part of increment in income used for payment of debt.
7. Case of full employment, additional investment will only lead to inflation
8. Scarcity of goods & services despite having high MPC

→ MPC is High in underdeveloped countries but the value of Multiplier is Low.

↓

Due to Structural Inadequacies.
- Lack of Infrastructure
- Unskilled workforce.

⇢ Inc in consumption Exp is not accompanies by Inc. in production.

ILLUSTRATION 9

In an economy investment expenditure is increased by ₹400 Crores and marginal propensity to consume is 0.8. Calculate the total increase in income and saving.

$\Delta I = 400$, MPC = 0.8

MPS = 0.2

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

$K = \frac{\Delta Y}{\Delta I} \Rightarrow K \times \Delta I = \Delta Y$

$5 \times 400 = 2000$

Inc in Income = 2000

Savings = 2000×0.2

= 400

ILLUSTRATION 10

An increase in investment by 400 Crores leads to increase in national income by 1,600 Crores. Calculate marginal propensity to consume.

$$K = \frac{1600}{400} = 4$$

$$\Rightarrow K = \frac{1}{MPS} \Rightarrow 4 = \frac{1}{MPS} \Rightarrow MPS = \frac{1}{4} = 0.25$$

$$MPC = 0.75$$

ILLUSTRATION 12

Suppose in a country investment increases by ₹ 100 Crores and consumption is given by C = 10 + 0.6Y (where C = consumption and Y = income). How much increases will there take place in income?

$$\Delta I = ₹100$$

$$MPC = 0.6 \rightarrow MPS = 0.4$$

$$K = \frac{1}{0.4} = 2.5$$

$$\Delta Y = 100 \times 2.5 = 250$$

ILLUSTRATION 11

In an economy, investment is increased by Rs 600 Crores. If the marginal propensity to consume is 0.6, calculate the total increase in income and consumption expenditure.

MPS = 0.4

$K = \frac{1}{0.4} = 2.5$

$\Delta Y = 600 \times 2.5$

$= ₹1500$

$\Delta C = 1500 \times 0.6$

$= 900$

- Determination of Equilibrium Income:

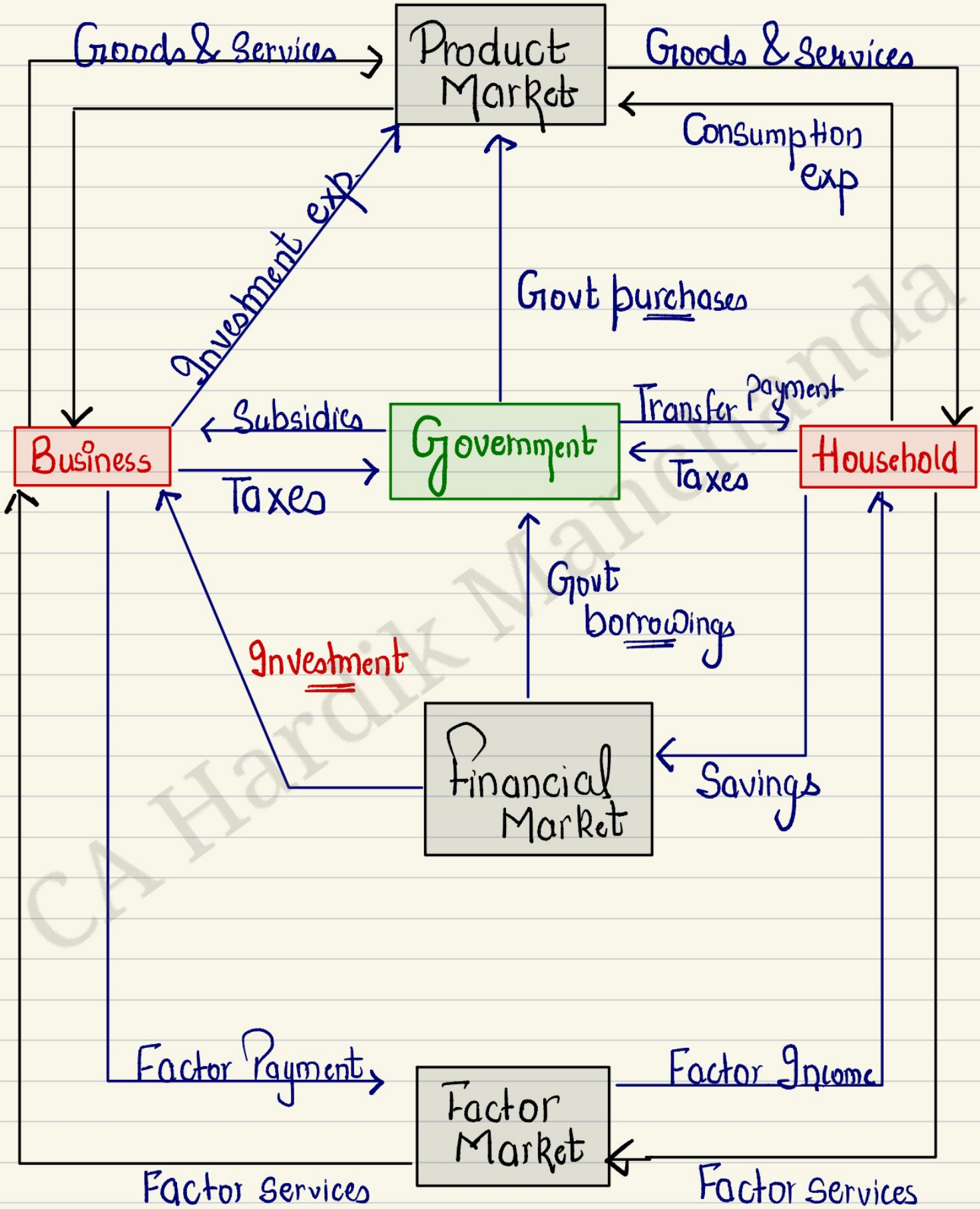
Three Sector Model.

- Household
- Business
- Government

$$AD = C + I + G$$

- C → Household Consumption
- I → Investment
- G → Govt Sector demand for goods & Services.

$$AS = Y = C + S + \text{Taxes}$$



→ Role played by Govt Sector in 3-sector Model:

1. Taxes on households & business sector to fund govt purchases.
2. Transfer payment to household & Subsidy to business
3. Govt purchases goods & services from business sector & factors of prod. from household sector.
4. Govt borrowing in financial markets to finance deficit.

---

* $AD = C + I + G_1$

Autonomous - do not directly depend on Income.

$AS = C + S + T$

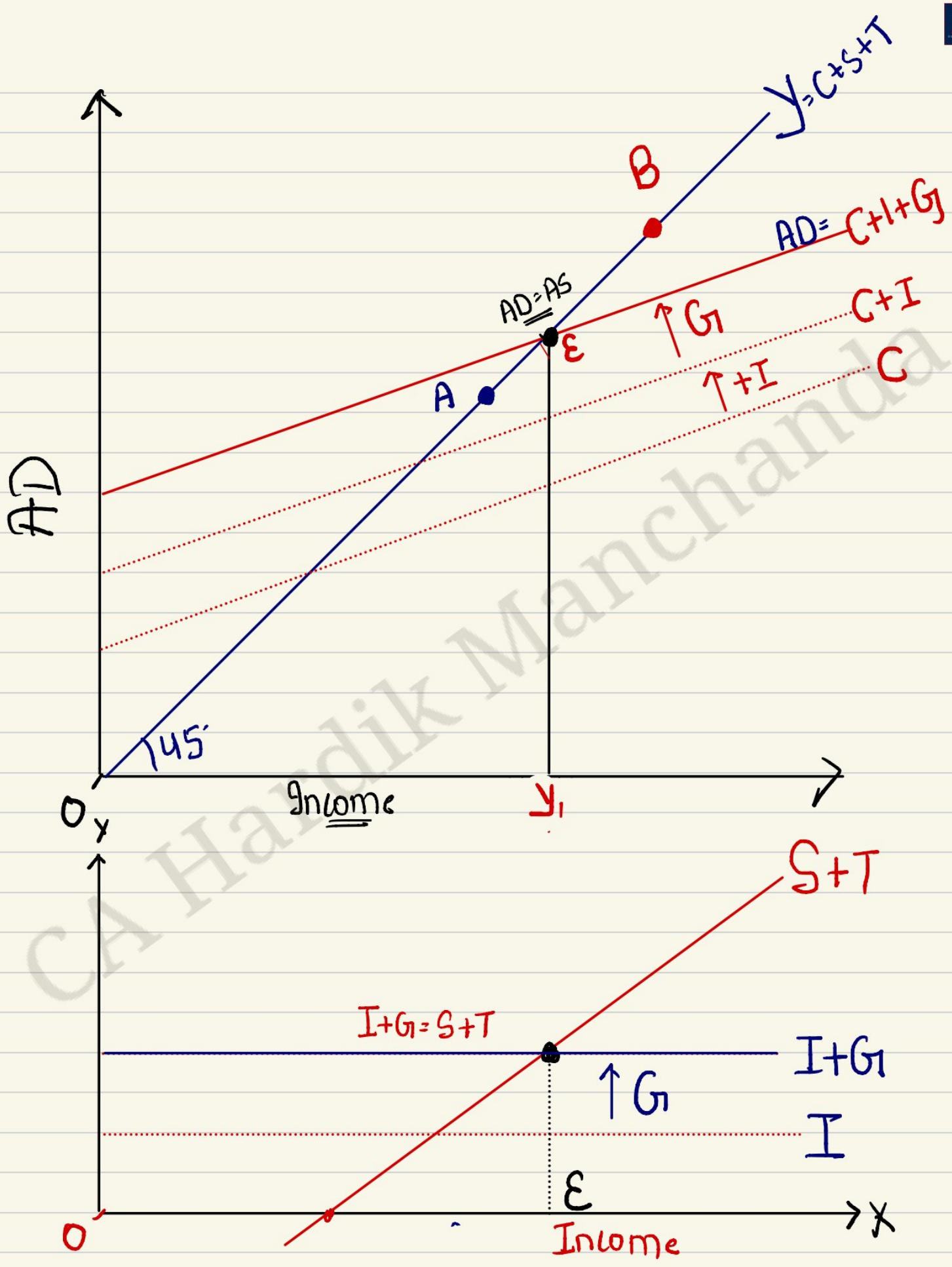
At equilibrium,

$$AD = AS$$

$$C + I + G_1 = C + S + T$$

$$\Rightarrow I + G_1 = S + T$$

Injections = Leakages



Why Other Points on the graph are not Point of Equilibrium.

1. Consider level of Income below Y_1 - A

$$AD > AS(Y)$$

$$I+G_1 > S+T$$

↳ Production ↑
Employment ↑
Y ↑

2. Level of Income above Y_1

$$AS > AD$$

$$S+T > I+G_1$$

↳ Future prod. ↓
Employment ↓
Y ↓

→ It is imp to note that change in Output / Employment is, what will restore equilibrium, not changes in price.

– Govt Sector & Income Determination

↓

Govt influences the level of income through Taxes, Transfer payment, Govt purchases & govt borrowing

Lump Sum Tax [$\bar{T}$]

↓

Do not depend on Income

↳ Autonomous Tax

Proportionate Tax [tY] ← Tax Rate

↓

depends on Income

- changes with change in Income

Eg. $t = 0.3$ (30%)

$Y = 100$

$= 100 \times 0.3 \Rightarrow 30$

$$\text{Total tax, } T = \bar{T} + tY$$

↓

Tax as a function of Income.

⇒ Disposable Income,

$$Y_d = Y - T$$

$$Y_d = Y - [\bar{T} + tY]$$

$$Y_d = Y - \bar{T} - tY$$

→ In case transfer payment is received:

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

↳ Autonomous

* Consumption function:

$$C = a + bY_d$$

$$C = a + b[Y - \bar{T} - tY + TR]$$

At equilibrium,

$$Y = C + I + G_1$$

$$Y = a + b[Y - \bar{T} - tY + TR] + I + G_1$$

Eg.

$C = 10 + 0.75 Y_d$

$I = 50$

$G = T = 20$ ⋯⋯→ Balance Budget

Calculate eq. Income.

$$Y_d = Y - 20$$

$$Y = C + I + G_1$$

$$Y = 10 + 0.75[Y - 20] + 50 + 20$$

$$Y = 80 + 0.75Y - 15$$

$$\Rightarrow Y = 65 + 0.75Y$$
$$0.25Y = 65$$
$$Y = \frac{65}{0.25} = 260$$

Ill. 14

$C = 100 + 0.75Y_d$
$I = 200$
$G_1 = T = 100$
$TR = 50$

1. $Y_d = Y - 100 + 50$
$= Y - 50$

$$Y = C + I + G_1$$
$$Y = 100 + 0.75[Y - 50] + 200 + 100$$
$$Y = 400 + 0.75Y - 37.5$$
$$0.25Y = 362.5$$
$$Y = 1450$$

Ill. 15

$C = 75 + 0.5[Y - T]$
$I = 80$
$T = 25 + 0.1Y$
$G_1 = 100$

$Y_d = Y - 25 - 0.1Y$
$Y_d = 0.9Y - 25$

$$K = \frac{1}{1 - 0.5(1 - 0.1)}$$
$$= \frac{1}{1 - 0.45} = \frac{1}{0.55}$$
$$= 1.82$$

$$Y = C + I + G_1$$
$$Y = 75 + 0.5(0.9Y - 25) + 80 + 100$$

$$Y = 255 + 0.45Y - 12.5$$
$$0.55Y = 242.5$$
$$Y = \frac{242.5}{0.55} \Rightarrow \boxed{440.91}$$

Eg.

$$C = 80 + 0.7Y_d$$
$$I = 200$$
$$T = 20 + 0.25Y$$
$$TR = 75$$
$$G = 50$$

$$Y_d = Y - 20 - 0.25Y + 75$$
$$= 0.75Y + 55$$

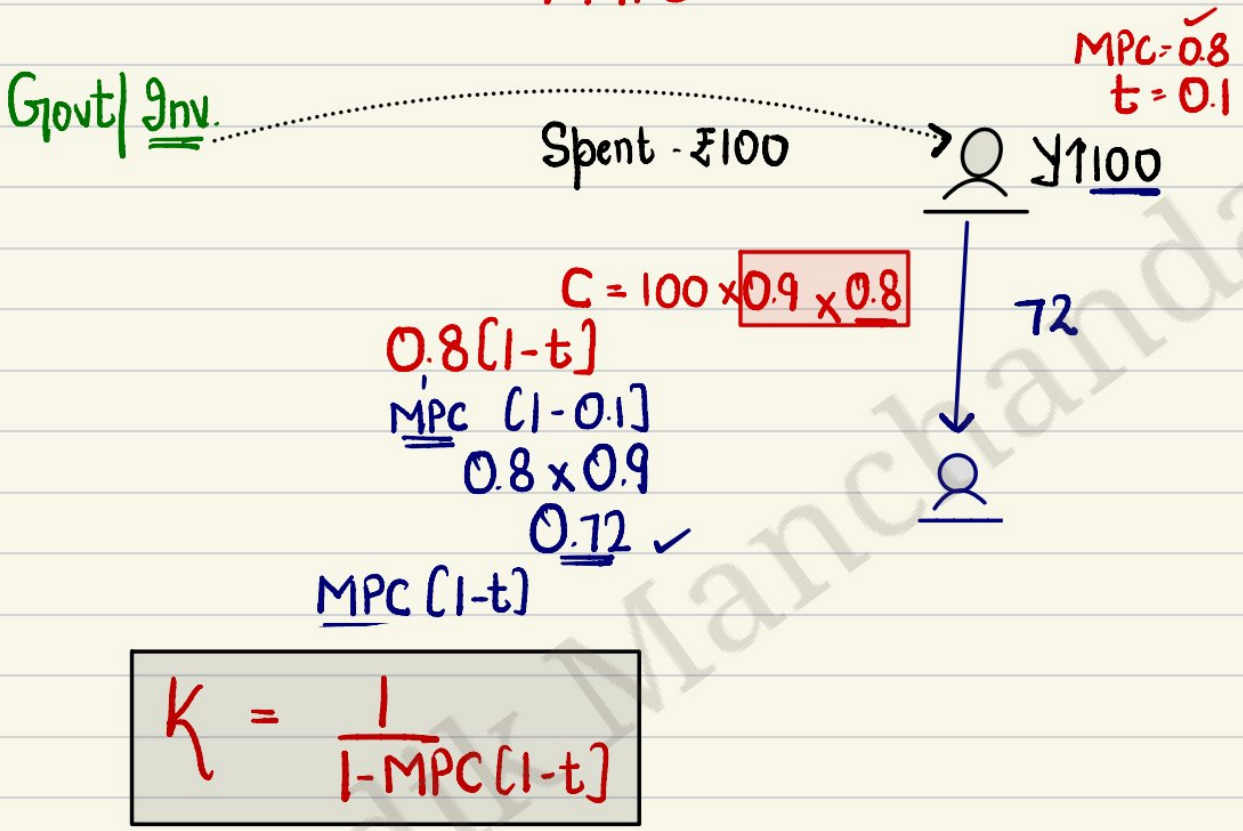
$$Y = 80 + 0.7(0.75Y + 55) + 50 + 200$$

$$Y = 330 + 0.53Y + 38.5$$

$$0.47Y = 368.5$$
$$Y = 784.04$$

$$K = \frac{1}{1 - 0.7(1 - 0.25)} = \frac{1}{1 - 0.525} = \frac{1}{0.475} = \underline{\underline{2.11}}$$

Multiplier - $k = \frac{1}{1-MPC}$. In 2-Sector economy.



$$K = \frac{1}{1-MPC[1-t]}$$

ILLUSTRATION 16

Suppose C= 100 + 0.80 (Y- T + TR); I = 200; T= 25+0.1Y; TR= 50; G = 100

Find out equilibrium level of Income?

$$K = \frac{1}{1-0.8[1-0.1]} = \frac{1}{1-0.8\times0.9} = \frac{1}{1-0.72}$$

$$K = \frac{1}{0.28} \Rightarrow 3.57$$

$$Y = 100 + 0.8[Y - 25 - 0.1Y + 50] + 100 + 200$$

$$Y = 400 + 0.8[0.9Y + 25]$$

$$Y = 400 + 0.72Y + 20$$

$$0.28Y = 420$$

$$\boxed{Y = 1500}$$

Determination of Equilibrium Income – Four Sector Model

- Household
- Business
- Govt
- Foreign Sector

Three additional flows in 4 Sector model:

1. Exports
2. Imports
3. Net capital inflow [Cap inflow - cap outflow]

* $\underline{AD} = C + I + G + \underbrace{(X - M)}_{\text{Net export}}$

Total planned exp

- Trade balance

→ **Exports** :- Injections in the national income

↳ foreign demand for domestic Output.

↳ Demand for export depends on foreign Income & is

Exogenous & Autonomous

→ **Imports** : Leakage or Outflow of national income.
↳ Not demand for domestic goods, deducted from AD

Import function:

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

$\overline{M}$ → Autonomous

m → Marginal propensity to import → $\frac{\Delta M}{\Delta Y}$ - Slope

At Equilibrium,

$$AD = AS\ [Y]$$

$$Y = C + I + G_1 + (X - M)$$

$$C = a + bY_d$$

$$M = \overline{M} + mY$$

$$C + S + T = C + I + G_1 + X - M$$

$$\Rightarrow \underbrace{S + T + M}_{\text{Leakage}} = \underbrace{I + G_1 + X}_{\text{Injections}}$$

Leakage ↳ Decrease the level of income

Injections ↳ Increases the level of income.

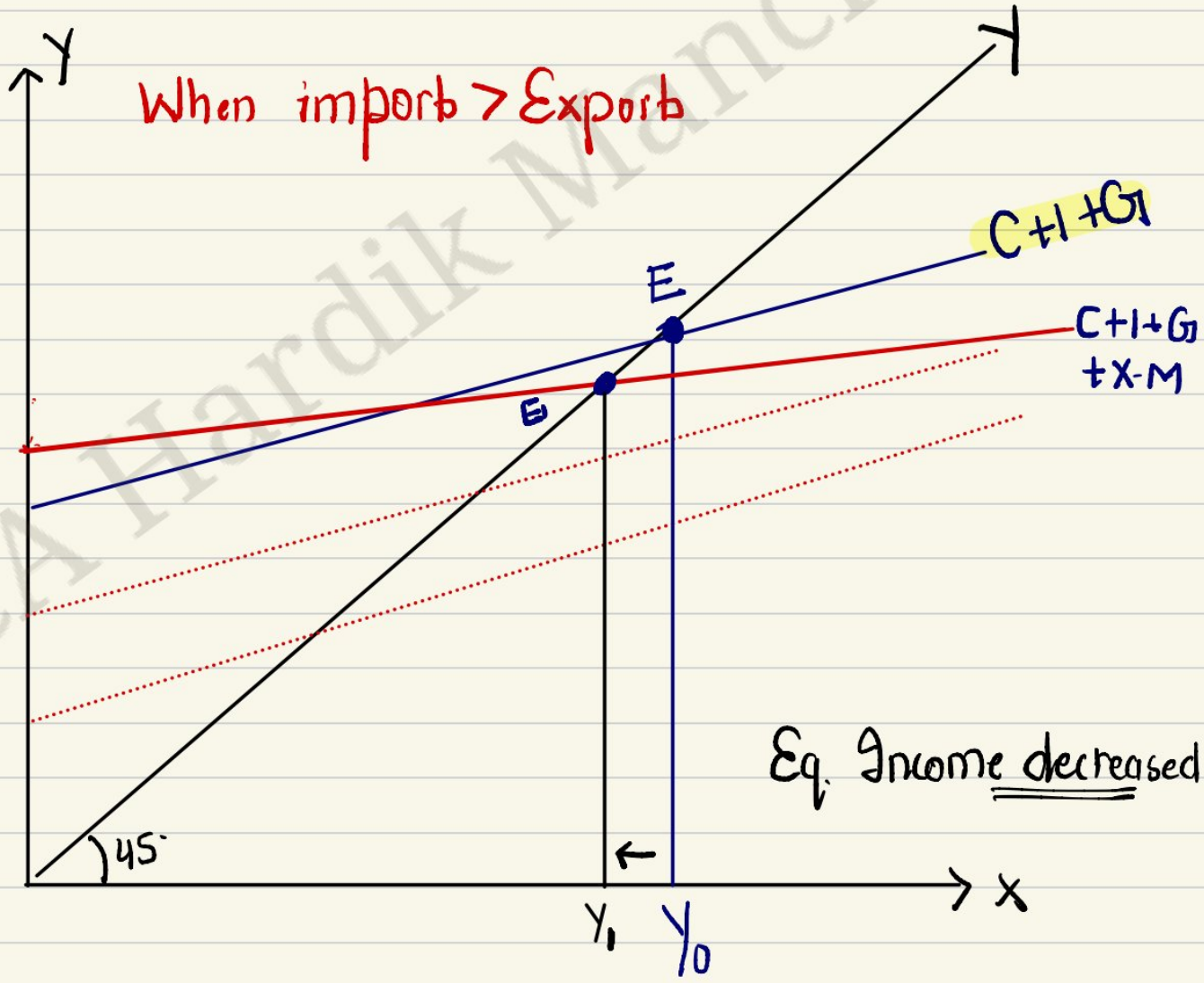
Imp

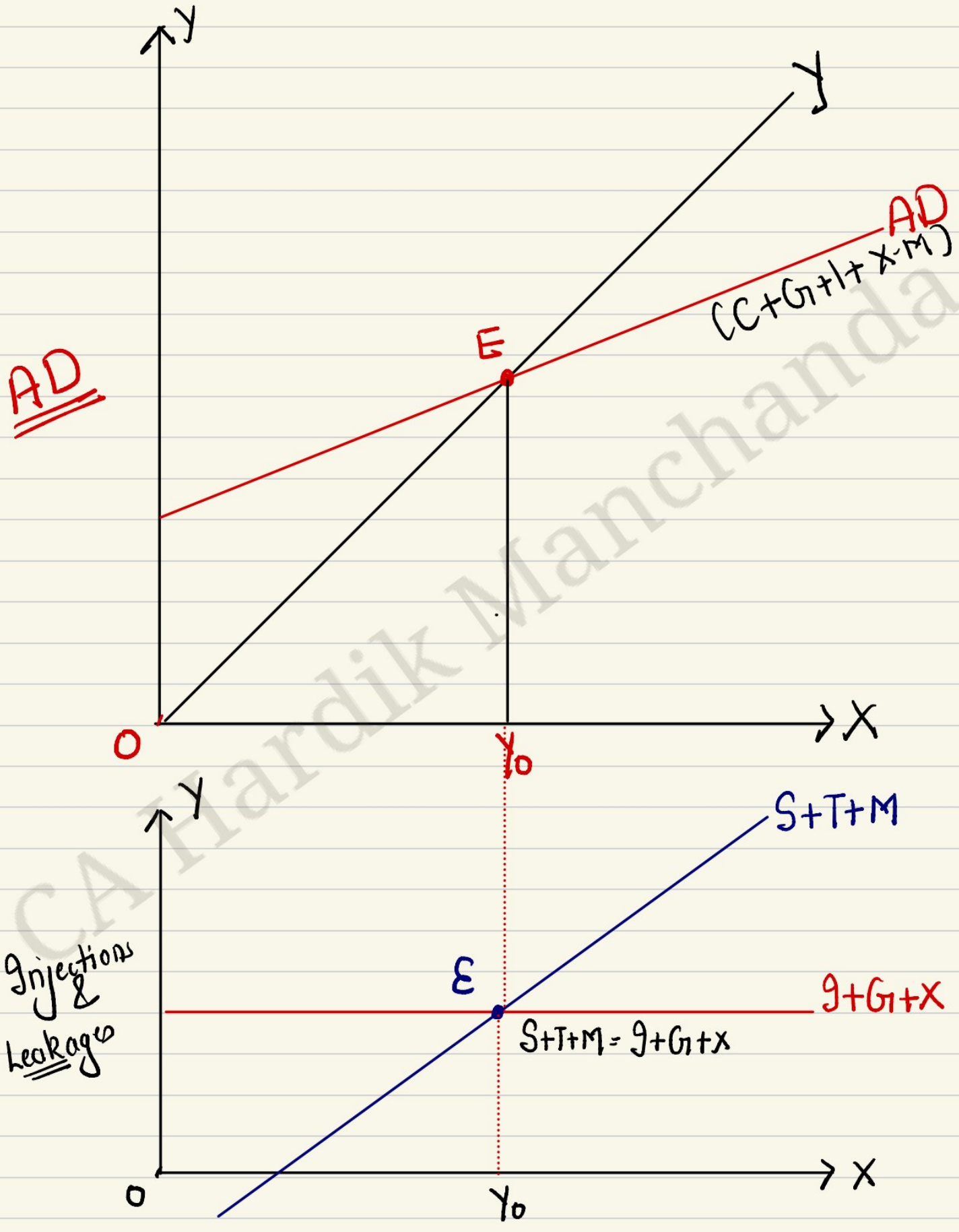
→ If $X > M$ → Net exports are positive
↳ Injections > Leakage

National income increases.

→ If $X < M$ → Net exports are negative
↳ Leakages > Injections

National income decreases





→ Foreign Trade Multiplier ← Export Multiplier

└ $\frac{\Delta Y}{\Delta X}$

$$Y = a + b(Y-T) + I + G_1 + X - \bar{M} - mY$$

$$\Rightarrow Y = a + bY - bT + I + G_1 + X - \bar{M} - mY$$

$$\Rightarrow Y - bY + mY = a - bT + I + G_1 + X - \bar{M}$$

$$Y(1-b+m) = a - bT + I + G_1 + X - \bar{M}$$

$$Y = \frac{1}{(1-b+m)}(a - bT + I + G_1 + X - \bar{M})$$

Now, Suppose exports increase by ΔX

↳ this will lead to ΔY

$$\rightarrow Y + \Delta Y = \frac{1}{(1-b+m)}(a - bT + I + G_1 + X + \Delta X - \bar{M})$$

$$\rightarrow Y + \Delta Y = \frac{1}{(1-b+m)}(a - bT + I + G_1 + X - \bar{M}) + \frac{\Delta X}{1-b+m}$$

$$Y + \Delta Y = Y + \frac{\Delta X}{1-b+m}$$

$$\boxed{\frac{\Delta Y}{\Delta X} = \frac{1}{1-b+m}}$$

If proportional tax is included:

$$FTM = \frac{1}{1-b(1-t)+m}$$ ✓

→ The greater the value of 'm', lower will be the autonomous exp Multiplier.
↳ FTM

The more open an economy is to foreign trade, the smaller will be the response of income to Aggregate demand shocks.
↳ change in govt spending / Investment

→ Higher m : larger proportion of income is spent on foreign goods not domestic goods.

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* Expansionary & Contractionary effect

1. Inc. in demand for exports - AD↑ → Eq. Income↑
Expansionary.

2. Inc. in Imports → AD↓ → Eq. Income↓
Contractionary.

* This should not be interpreted that: Exports are goods & imports are harmful.

→ Countries import goods that can be efficiently produced abroad & trade increases the overall efficiency of worldwide allocation of resources.

Ill.18

An economy is characterised by the following equation-

Consumption	$C = 60+0.9Y_d$
Investment	$I = 10$
Government expenditure	$G = 10$
Tax	$T = 0$
Exports	$X = 20$
Imports	$M = 10 + 0.05\ Y$

What is the equilibrium income?

Calculate trade balance and foreign trade multiplier.

$$Y = C + I + G + X - M$$
$$= 60 + 0.9Y + 10 + 10 + 20 - 10 - 0.05Y$$
$$Y = 90 + 0.85Y$$
$$0.15Y = 90 \Rightarrow \boxed{Y = 600}$$

→ $FTM = \frac{1}{1-b+m} = \frac{1}{1-0.9+0.05} = \frac{1}{0.15}$

$= 6.67$

→ Trade Balance $= X - M$

$= 20 - 10 - 0.05 \times 600$

$= -20$

└ Deficit

H.W - Ill. 17

ILLUSTRATION 17 64.25

The consumption function is $C = 40 + 0.8Y_d$, $T = 0.1Y$, $I = 60$ Crores $G = 40$ Crores, $X = 58$ and $M = 0.05\ Y$. Find out equilibrium level of income, Net Export, net export if export were to increase by 6.25.

$Y_d = Y - 0.1Y$

$= 0.9Y$

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

$Y = 40 + 0.8 \times 0.9Y + 60 + 40 + 58 - 0.05Y$

$Y = 198 + 0.72Y - 0.05Y$

$0.33Y = 198$

$Y = 600$

Net exports $= X - M$

$= 58 - 0.05 \times 600$

$= 28$

At, $X = 64.25$

$$Y = 40 + 0.72Y + 60 + 40 + 64.25 - 0.05Y$$
$$Y = 204.25 + 0.67Y$$
$$0.33Y = 204.25$$
$$Y = 618.94$$

Net exports $= 64.25 - 0.05 \times 618.94$
$= 33.303$

Multiple Choice Questions

AS=AD

1) In the Keynesian model, equilibrium aggregate output is determined by AS
(a) aggregate demand
(b) consumption function
(c) the national demand for labor
(d) the price level

2) Keynes believed that an economy may attain equilibrium level of output
(a) only at the full-employment level of output
(b) below the full-employment level of output
(c) only if prices were inflexible
(d) a) and c) above

3) According to Keynes, consumption expenditure is determined by
(a) the level of interest rates
(b) extent of government taxes and subsidies
(c) disposable income
(d) autonomous investment expenditure

4) The marginal propensity to consume (MPC) can be defined as
(a) a change in spending due to a change in income
(b) a change in income that is saved after consumption
(c) part of income that is spent on consumption.
(d) part of income that is not saved.

MPC

5) If the consumption function is expressed as C = a + bY then b represents

(a) autonomous consumer expenditure when income is zero

(b) the marginal propensity to consume.

(c) the expenditure multiplier when consumption is increased

(d) part of disposable income

autonomous

6) If the consumption function is expressed as C = a + bY then a represents

(a) autonomous consumer expenditure.

(b) the marginal propensity to consume.

(c) the consumption income relationship

(d) Non- linear consumption function

7) If the consumption function is C = 20 + 0.5Yd, then an increase in disposable income by Rs. 100 will result in an increase in consumer expenditure by _____

↓
MPC
0.5 x 100 = 50

(a) 25

(b) 70

(c) 50

(d) 100

8) If the autonomous consumption equals Rs. 2,000 and the marginal propensity to consume equals 0.8. If disposable income equals Rs. 10,000, then total consumption will be _____

C = a + bYd
= 2000 + 0.8 x 10000
= 2000 + 8000

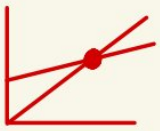
(a) 8,000

(b) 6,000

(c) 10,000

(d) None of the above

Equilibrium



9) In the Keynesian cross diagram, the point at which the aggregate demand function crosses the 45-degree AS line indicates the

(a) level of full employment income. ✗

(b) less than full employment level of income.

(c) equilibrium level of income which may or may not be full employment level of income

(d) autonomous level of income which may not be full employment level of income

No foreign Sector

10) In a closed economy, aggregate demand is the sum of

(a) consumer expenditure, demand for exports and government spending. ✗

(b) consumer expenditure, planned investment spending and government spending. C+I+G

(c) consumer expenditure, actual investment spending, government spending and net exports. ✗

(d) consumer expenditure, planned investment spending, government spending, and net exports. ✗

11) Under equation C= a+by, b=0.8, what is the value of 2 sector expenditure multiplier?

$K = \frac{1}{1-MPC} = \frac{1}{0.2}$

(a) 4

(b) 2

(c) 5

(d) 1

12) Suppose in an economy

Consumption Function	C = 170+0.80 Y
Investment spending	I = 200
Government Spending	G = 150
Tax	Tx = 30+0.30Y
Transfer payments	Tr = 60
Exports	X = 45
Imports	M = (20 + 0.2Y)

Equilibrium level of income is:

$Y_d = Y - 30 - 0.3Y + 60$
$= 0.7Y + 30$

(a) 1021.5

(b) 880.8

(c) 889.06

(d) 989.06

$Y = 170 + 0.8[0.7Y + 30] + 200 + 150 + 45 - 20 - 0.2Y$
$Y = 545 + 0.56Y + 24 - 0.2Y$
$0.64Y = 569$

13) Suppose you are given following information-

Consumption function C = 10 + 0.8Yd $\quad Y_d = Y - 50$

Tax T = 50

Investment spending I = 135

Government Spending G = 60

Exports X = 35

Imports M = 0.05 Y

$Y = 10 + 0.8[Y - 50] + 135 + 60 + 35 - 0.05Y$
$= 10 + 0.8Y - 40 + 135 + 60 + 35 - 0.05Y$
$Y = 200 + 0.75$
$0.25Y = 200 \Rightarrow Y = 800$

Where Y and Yd are income and personal disposable income respectively.

Net exports at equilibrium level is:

(a) 25

(b) -10

(c) 5

(d) -5

$35 - 0.05 \times 800$
$35 - 40$
$= -5$

14) An increase of investment by Rs. 600 Crores resulted in an increase in national income by Rs. 2400 Crores. MPC is:

(a) 0.25
(b) 4
(c) 0.75
(d) 0.5

$k = \frac{\Delta Y}{\Delta I} = \frac{2400}{600} = 4 = \frac{1}{1-MPC}$

$4(1-MPC) = 1$
$1-MPC = 0.25$
$1 - 0.25 = MPC$
$0.75 = MPC$

Injections > Leakage

15) If net exports are positive, national income will:

(a) Increase
(b) Decrease
(c) No change
(d) either a or b

16) Suppose in an economy
C = 100 + b(Y − 50 −t Y) ; I = 50; G = 50 ;X = 10; M = 5 + 0.1Y; MPC (b) = 0.8; Proportional income tax rate (t) = 0.25
Foreign trade multiplier will be:

(a) 3.33
(b) 2
(c) 3
(d) 10

m

$\frac{1}{1-b(1-t)+m} = \frac{1}{1-0.8(1-0.25)+0.1}$ (0.75)

$\frac{1}{1-0.6+0.1} = \frac{1}{0.5} = 2$

x —— Chapter over :) —— x