

NATIONAL INCOME

(NNP_{fc}) Accounting
 Net National at factor cost.

NIA, pioneered (introduced) by the Nobel - Prize Economists Simon Kuznets and Richard Stone.

The CSO (Central Statistical Organisation) in the Ministry of Statistics & Programme Implementation (MOSPI) is responsible for the compilation of NA Statistics. At the State level → State Directorates of Economics & Statistics (DESs) compile State Domestic Product (SDP) & other aggregates.

USEFULNESS AND SIGNIFICANCE OF NATIONAL INCOME ESTIMATES

- Helps business to predict future DP of their product.
- Composition and Structure of National Income can be known for different sectors.
- Sectoral contribution helps the government in making policy for the economic growth.
- Economic Policies can be framed according to the contribution in national income by all the sectors.
- Provides information on income distribution, which is helpful in framing fiscal policy of the government.
- International comparison can be made in respect of income standard of living to acquire loans.
- Provides guides for dealing with fluctuation in business cycle.

BASIC ADJUSTMENTS

① $Gross = Net + Depreciation$
(consumption of fixed capital)

$Net = Gross - Dep$

② $National = Domestic + NFIA$

$Domestic = National - NFIA$

③ $NFIA \rightarrow$ Net Factor Income from Abroad.

(12^{th}) $= \text{Income received from abroad} - \text{Income paid to abroad.}$

(08)

$NFIA = \text{Net Compensation of employees} + \text{Net Income from Property \& entrepreneurship} + \text{Net retained earnings (undistributed profit)}$

③ $Market Price = \text{Factor Cost} + NIT$
(MP) (FC)

$FC = MP - NIT$

Where,

$NIT \rightarrow$ Net Indirect Taxes

$= \text{Indirect taxes} - \text{Subsidies}$

④ $GNP = NDP + Dep + NFIA + NIT$
Gross National Product = Net Domestic Product + Depreciation + Net Factor Income from Abroad + Net Indirect Taxes

$$\text{NNP}_{fc} = \text{GDP}_{mp} - \text{dep} + \text{NFA} - \text{NIT}$$

$$\text{GDP}_{fc} = \text{NDP}_{fc} + \text{dep} + \text{NFA} + \text{NIT}$$

$$\text{NNP}_{mp} = \text{GDP}_{fc} - \text{dep} + \text{NFA} + \text{NIT}$$

$$\text{GDP}_{fc} = \text{NDP}_{fc} + \text{dep}$$

Few Important Concept

Factors of Production → Things that are used for the production of a commodity - these are Land, Labour, Capital, Entrepreneurship

Factor Income →

(T)	(L)	(K)	(owner)
↓	↓	↓	↓
rent	wages	Interest	Profit
(R)	(W)	(I)	(π)

It is the income received by the factors of production rendering (providing) their productive services.

It is an Earning Concept.

It is bilateral.

It is with quid-pro-quo (something in return)

It is included in national income

TRANSFER INCOME -

(a) It is the amount received without rendering any productive services.

(b) These are unilateral.

(c) It is a receipt concept.

(d) It is without any quid pro quo.

(e) It is not included in National Income. Eg: - gifts, donations, old age pension, scholarship.

④ GROSS DOMESTIC PRODUCT (GDP_{mp})

① It is the value of All final goods & services produce in the country or domestic territory within a given period.

② ① NOMINAL GDP / GDP at current prices.

$$GDP = P \times Q$$

GDP ↑ P ↑ / Q ↑

Real GDP / GDP at constant prices.

$$GDP = P \times Q$$

GDP ↑ = P same × Q ↑

better indicator for Economic Growth

⑤ GDP DEFATOR

→ The calculation of Real GDP gives a useful measure of Inflation known as GDP deflator.

→ It is the ratio of Nominal GDP in a given year to Real GDP of that year, in other word it is used to deflate or take inflation out of GDP. or it is a Price Index used to convert Nominal GDP to Real GDP

Symbolically

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

Nominal GDP and Real GDP must be the same in the base year, the deflator of the base year is always 100.

→ using ^{the} GDP deflator, the inflation rate between two consecutive years can be calculated as

$$\text{Inflation rate in } t_2 = \frac{GDP \text{ deflator of } t_2 - GDP \text{ deflator of } t_1}{GDP \text{ deflator of } t_1}$$

Calculate GDP deflator for the Year 2018. When

Nominal GDP is 1550

GDP is 1190

GDP deflator = ?

$$\frac{1550}{1190} \times 100 = 130.25$$

If Nominal GDP for 2014 is 500 and Real GDP is 500

GDP deflator = 100

$$\text{GDP deflator} = 100$$

Find GDP deflator for 2016. If Nominal GDP 1150 Real GDP = 800.

Ans $\frac{1150}{800} \times 100 = 143.75$

Note → If the GDP deflator is greater than 100 then Nominal GDP is greater than Real GDP i.e. there is inflation and vice versa.

The Nominal and Real GDP of a Country in a particular Year are 3000 Crores and 4710 calculate GDP deflator

$$\frac{3000}{4710} \times 100 = 63.83 \quad \text{Deflation}$$

find ^{Nominal} Real GDP if Real GDP is 450 Price index 120

$$\frac{450 \times 120}{100} = 540$$

GDP deflator in 2022 = 154.87 points & and GDP deflator is expected to be = 167.94 and 175.67 for 2024.

(a) find inflation rate 2023 $\frac{167.94 - 154.87}{154.87} \times 100 = 8.43$

(b) find inflation rate in 2024 $\frac{175.67 - 167.94}{167.94} \times 100 = 4.60$

$$\frac{2023 - 42}{2022 - 41} = \frac{GDP_{2023} - GDP_{2022}}{GDP_{2022}} \times 100$$

$$= \frac{167.94 - 154.87}{154.87} \times 100 = 8.43$$

⑥ Net National Product at factor cost (NNP_{fc}) or National Income.

→ It is defined as the factor income accruing to the Normal Resident of a Country during a Year. It is the sum of Domestic Factor Income and NFIA, in other words, it is the value of factor income generated within the Country + Factor Income to abroad in an accounting Year.

$$NNP_{fc} \Rightarrow \text{National Income} = FID$$

$$\begin{aligned} & \text{Capital Income Earned} \\ & \text{Indigenous Factor Income} \\ & \text{GDP} + \text{NFIA} \\ & - \text{Depreciation} \end{aligned}$$

If NFIA is +ve $NI > DI$
If NFIA is -ve $NI < DI$

⑦ Per Capita Income (PCI)

→ It is a measure of a Country's Economic out per person. It is obtained by dividing the Country's GDP adjusted by inflation by the total Population.
→ It serves as an indicator of the standard of living of the people.

$$PCI = \frac{NI \text{ (Real)}^{\text{adjusted for inflation}}}{\text{Total Population}}$$

⑧ Personal Income (PI)

→ It is the income received by the House hold Sector including Non Profit Institutions serving House holds.

→ It is the measure of actual current income receipts of persons from all sources which may or may not be

earned from productive services during a given period of time (income from all sources).

$$PI = NI + \text{Income received but not earned} - \text{Income earned but not received}$$

$$PI = NI - \text{Undistributed profit} - \text{Net Interest payments made by HHS} - \text{Corporate tax} + \text{transfer payment to the HHS from firms \& government}$$

Note:- National Income is not a Sum of Personal Income

Disposable Personal Income (DI)

→ It is the measure of the amount of money in the hand of an individual after paying personal income taxes and other compulsory payment to the Government

$$DI = PI - \text{Personal income taxes} - \text{Non tax payments}$$

(a) Net National Disposable Income (NNDI)

$$NNDI = \text{Net national income} + \text{Other current transfers from the rest of the world}$$

(or)

$$NNDI = \text{Net national income} + \text{net taxes on incomes} - \text{Wealth receivable from abroad} + \text{net social contributions \& benefits receivable from abroad}$$

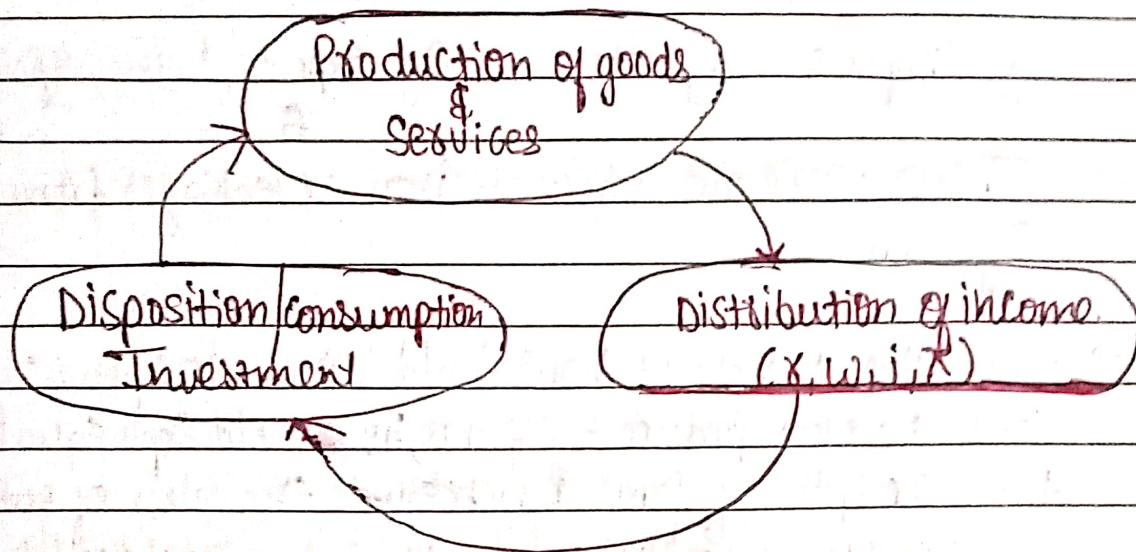
(b) Gross National Disposal Income (GNDI)

$$GNDI = NNDI + \text{consumption of fixed capital (Dep)} + \text{Other net current transfers from rest of the world}$$

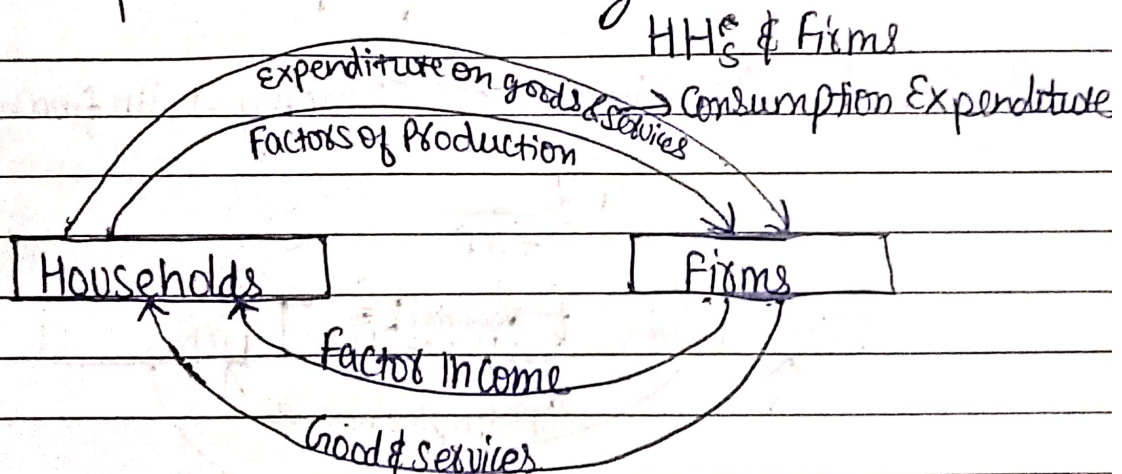
Measurement of NI in India

Circular Flow of Income

It refers to the continuous circulation of Production, Income generation and Expenditure involving different Sectors of the Economy.



Circular flow in 2 sector Economy



Expⁿ on goods & services + factor income = Money Flow
 Goods & services + factors of production = Real Flow

Money Flow + Real Flow = Circular Flow.

Leakage

- flow of money outside the Economy / Circular flow

e.g. - Imports, Savings etc.

Injections

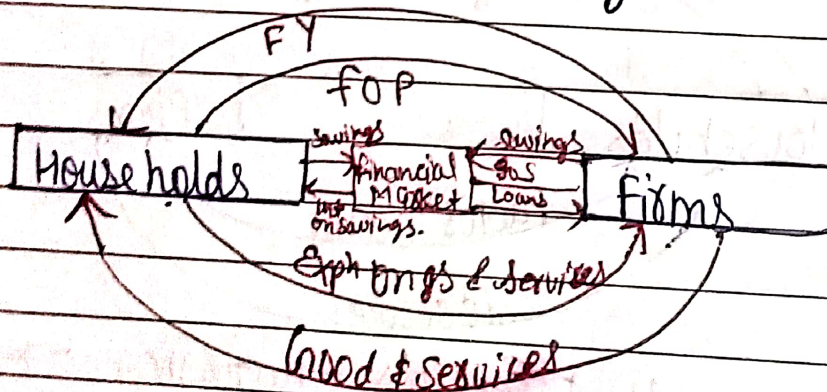
- introduction of money in an Economy / Circular flow

e.g. Exports, loans, deficit financing etc.

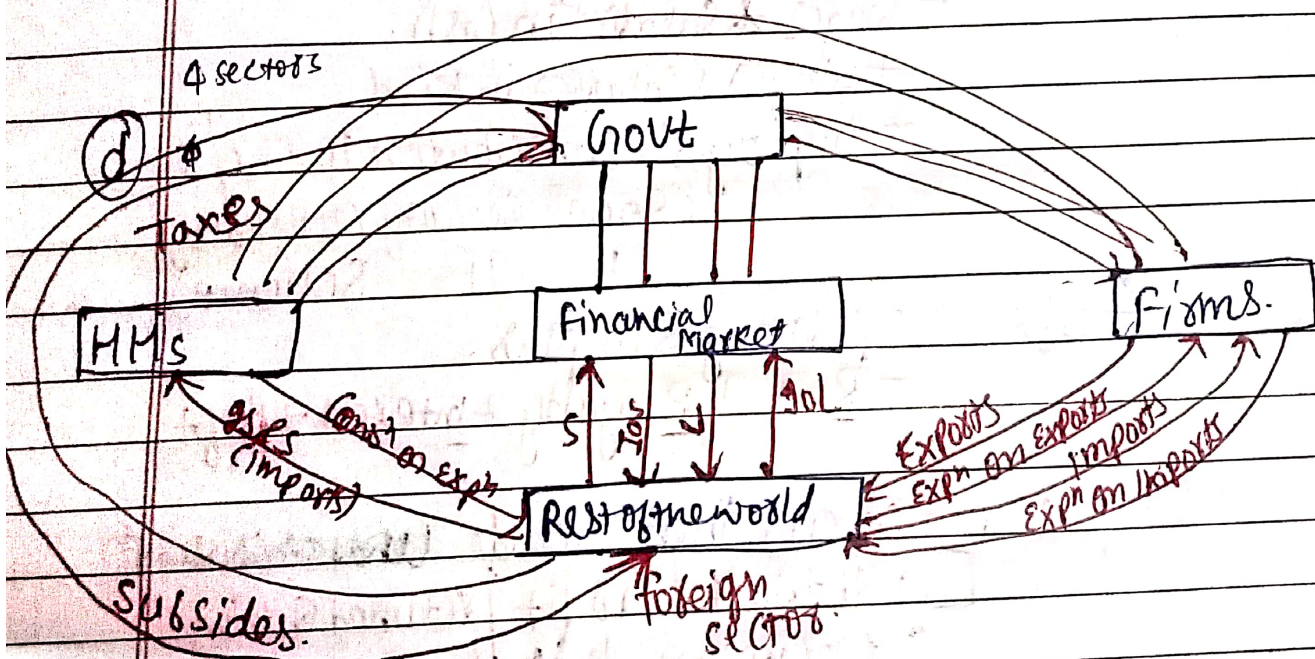
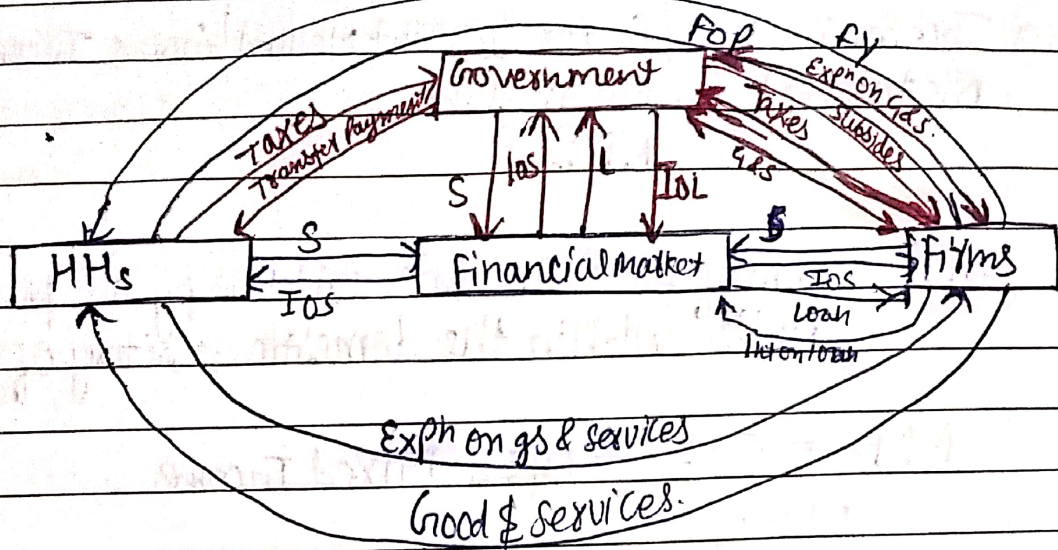
→ There are no injection into or leakages from the System.

→ Since the whole of household income is spent on Goods & services produce by firms, household Exph equals the total receipts of firms which equals the value of output.
i.e. $\text{factor payment} = \text{HH}_1 \text{ incomes} = \text{HH}_1 \text{ Exph} = \text{Total Receipts of firms} = \text{Value of output}$

(b) Circular flow in 2 sector Economy with financial Market



(c) Circular flow in 3 Sector economy (HHs, Firms & Government).



* Expenditure Method / Income Disposition / Income disposal Approach.

$$\text{GDP}_{mp} = \text{PFCE} + \text{GFCE} + \text{GDCF} + \text{NX}$$

where,

PFCE $\rightarrow$ Private / Personal final consumption expenditure
 = Exph done by HHS
 + Exph done by non-profit seeking Organisation serving HHS.

+ GFCE = Government final consumption expenditure.
 = Govt Purchase of goods & services.

+ GDCF $\rightarrow$ Gross Domestic Capital formation.

= Gross business fixed investment.

+ Gross residential consumption.

+ Gross public investment for the welfare.

+ Gross inventory investment.

+ Expenditure on acquisition of valuable such as jewellery, work of art etc.

+ NX $\rightarrow$ Net Exports.

(EXPORT - IMPORTS)

X - M

$\Rightarrow$ If NDCF is given,

$$\text{GDCF} = \text{NDCF} + \text{Dep}$$

$$\text{GDFCF} = \text{fixed.}$$

$$\text{GDCF} = \text{GDFCF} + \text{acquisition of valuables} + \Delta \text{in stock (Closing - Opening)}$$

$$\text{GDCF} = \text{NDCF} + \text{Dep} + \text{acq} + \Delta \text{in stock}$$

$$\text{GDP}_{mp} = \text{PFCE} + \text{GFCE} + \text{GDCF} + \text{NX}$$

$$\text{NNP}_{fc} = \text{GDP}_{mp} - \text{Dep} + \text{NFA} - \text{NIT}$$

Value-added / output / Product method / industrial origin method
(GVAmp) ^{net output method}

GVAmp → Gross value of output at Market price
= Sales + Change in Stock
(Closing - opening)

or
Price × units sold.
(CPXQ)

GVAmp → Gross value added at market price.
= GVAmp - Intermediate Consumption
(Purchase of raw material ^{power} ~~full cost~~)

GDPmp = ΣGVAmp (PS + SS + TS)

Note:

Purchases 500 ✓ 500 ✓

Import 200 X 800 ✓

Domestic purchases 200 ✓ 500 ✓

Imports 500 ✓ 200 ✓

Sales 200 ✓ 100 ✓

Export 100 X 200 ✓

Domestic Sale 200 ✓ 50 ✓

Exports 50 ✓ 200 ✓

Calculate NVApc

Items ₹ in crore

Purchase of material

Sales

Dep

Dis stock

Cl stock

Excise tax
Intermediate goods
Subsidies

85

450

30

40

30

45

200

15

$$GVA = 450 + 10 \\ = 460$$

$$GVA_{mp} = GVA - Int \\ = 460 - 200 \\ = 260$$

$$NVA_{pc} = GVA_{mp} - Dep - VIT \\ = 260 - 30 - (45 - 15) \\ = 260 - 60 \\ = 200$$

* Precautions

- ~~One~~ Account Production of fixed Assets by government Enterprises and Households are included.
- Imputed value of Production of Goods for self consumption are included.
- Imputed Rent of ~~owned~~ occupied houses are included.
- Only factor incomes are included and transfer incomes are excluded.
- Sale and purchase of Second hand goods is excluded as their value was included in the Year they were Produced.
- Sale and purchase of bonds and shares are not included as they are purely financial transactions.
- Commission received by the broker for ~~tendering~~ (providing) his productive services for sale and purchase of assets is included.
- Wind fall gains like lottery are excluded.
- Income from smuggling and gambling are not included as they are unaccounting income.
- Only ~~sale and~~ the value of final Goods is included to Avoid double counting.

NOTE → Income method may be most suitable for developed economies where people properly file their income tax return.

- 2) With the growing facility in the use of commodity flow method of Estimating Expenditure, an increasing proportion of the national income is being estimated by Expenditure method.
- 3) In the Agriculture Sector net value added is estimated by the production method. (value added method)
- 4) In the Small scale sector net value added is estimated by Income method.
- 5) In the Construction Sector Net value added is estimated by Expenditure method.

SYSTEM OF REGIONAL ACCOUNTS IN INDIA

- Regional Account provide an integrated data base on many transaction taking place in the regional economy and ~~thereby~~ help decision making at the regional level.
 - ~~At the regional level~~
- 6-16
- State Income or net domestic Product (NSDP) is a measure in monetary terms of the value of all goods & services produced in the state, within the given period of time. Accounted without duplication.

- Per Capita State income is obtained by dividing the NSDP by the mid year project population of the State.
- The State level estimate are prepared by the State Income Units of the respective State Directorates of Economics and Statistics (DES).
- The CSO assists the states in the preparation of these estimates by rendering advice on conceptual and methodological problems.
- **Imp** The preparation of State Income estimates certain activities like railways, banking and insurance and central govt. administration that cut across state boundaries cannot be assigned to any one State. These are known as supra regional sectors. Of the Economy this estimates compiled for the Economy as a whole and allocated to the State on the basis of relevant indicators.

The Keynesian Theory of Determination of national income. - John Maynard Keynes in 1936

Book → (Keynes's General theory of Employment Interest and Money)

→ Keynes introduced many building blocks of modern macroeconomics.

- 1) Relation of Consumption to Income and the multiplier.
- 2) Liquidity Preference.
- 3) Importances of Expectation in affecting consumption and investment.

→ Keynes theory is explain in three models.

- 1) Two sectors
- 2) Three sectors
- 3) Three sectors

BASIC CONCEPTS AND FUNCTIONS

(1) $AD = C + I$

(2) Consumption (C)

$Y = \text{Consumption} + \text{savings}$

$Y = C + S$

$S = Y - C$

$C = a + bY$ → induced consumption

autonomous consumption

$\uparrow Y \geq C \uparrow \rightarrow S \uparrow$

(savings)

- consumption irrespective of income

Keynes psychological law of consumption.

$a \neq 0$ if $Y = 0$

Consumption function

$C = F(Y)$

(a) Average Propensity to consume (APC)

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

Y	C
1000	600
2000	1200

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

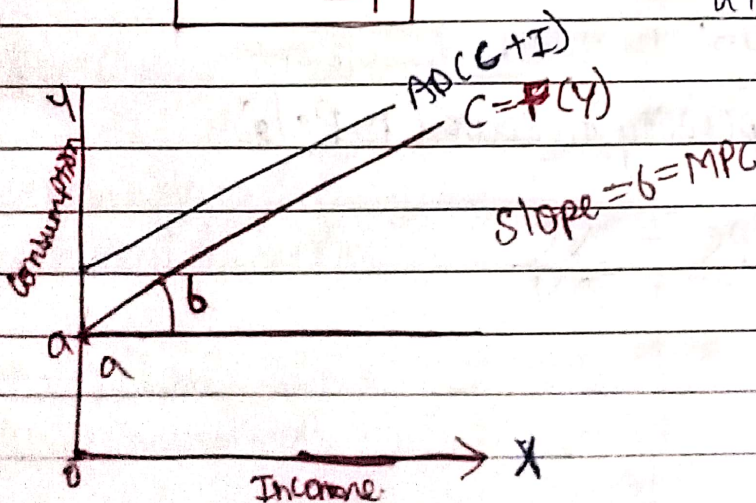
$MPC = \frac{600}{1000} = 0.6$

(b) Marginal Propensity to consume (MPC)

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

$AD = C + I$

$a + bY = \bar{I}$



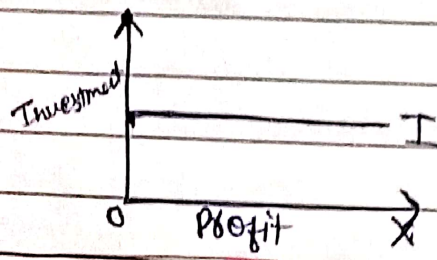
INVESTMENT

Autonomous



Investment irrespective of Profit

- generally by the govt

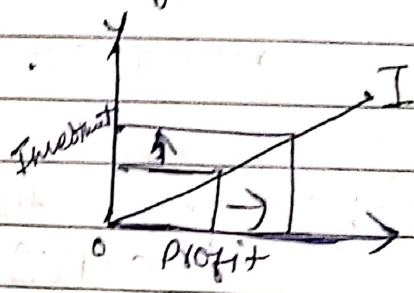


Induced



Profit $\uparrow \rightarrow$ Inv $\uparrow$

- generally done by Private Sector.



Note $\rightarrow 0 < MPC < 1$
(6)

~~Save~~

SAVIN FUNCTION $\rightarrow S^f(Y)$

$$Y = C + S$$

$$S = Y - C$$

① Average Propensity to Save (APs)

$$APs = \frac{S}{Y}$$

Y	C	S	APs
1000	600	400	$\frac{400}{1000} = 0.4$
600	200	400	

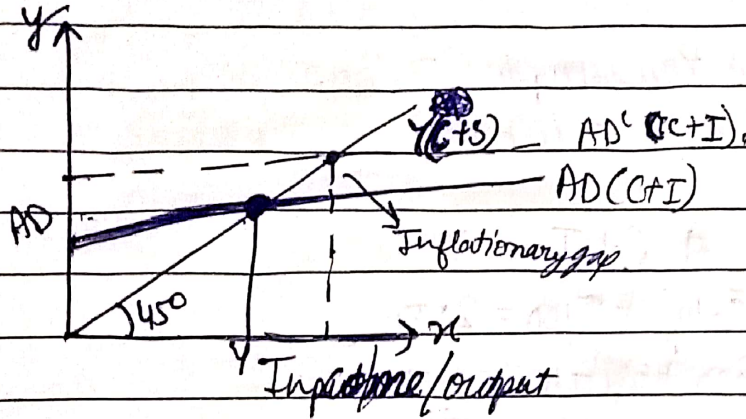
② Marginal Propensity to Save (MPS)

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

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

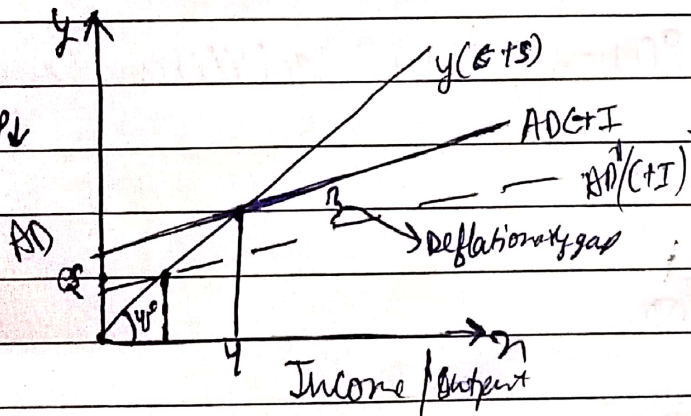
Equilibrium with unemployment

(I) Inflation, $AD > AS$, $P \uparrow$



When the aggregate Demand for an output is greater than the full Employment level of output then there is Excess Demand. Excess Demand leads to Inflationary gap and causes Demand pull inflation.

(II) Deflation, $AD < AS$, $P \downarrow$



Investment Multiplier (K)

- multiplier refers to the phenomenon where a increase in investment expⁿ will lead to a proportionately larger change or multiple change in the equilibrium level of national income. the Investment multiplier explains how many times the equilibrium aggregate income increases as a result of an increase in autonomous investment. the ratio of ΔY to ΔI is called investment multiplier. In other words the process of multiple increase in equilibrium income or national income due to increase in investment depicts the investment multiplier. The process ~~to~~ behind the multiplier can be compared to 'ripple effect' of water.

$$K = \frac{\Delta Y}{\Delta I} \quad \begin{array}{l} \text{Change in Income} \\ \text{Change in Investment} \end{array}$$

or

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

or

$$K = \frac{1}{MPS} \quad (MPC + MPS = 1)$$

Suppose in a country $AI = 100$ (to say) $C = 15 + 0.6Y$
~~the~~ $Y = ?$

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

$$K = \frac{1}{1-0.6}$$

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

$$K = 2.5$$

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

$$2.5 = \frac{\Delta Y}{100}$$

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

$$250 = \Delta Y$$

Determination of Eq in 3 sector Economy

At Eq: (Firms, firms & Gov).

$$Y = C + I + G$$

There is no foreign sector so GDP & N-T are Same.

At Eq:-

$$AD = AS$$

$$AD = C + I + G$$

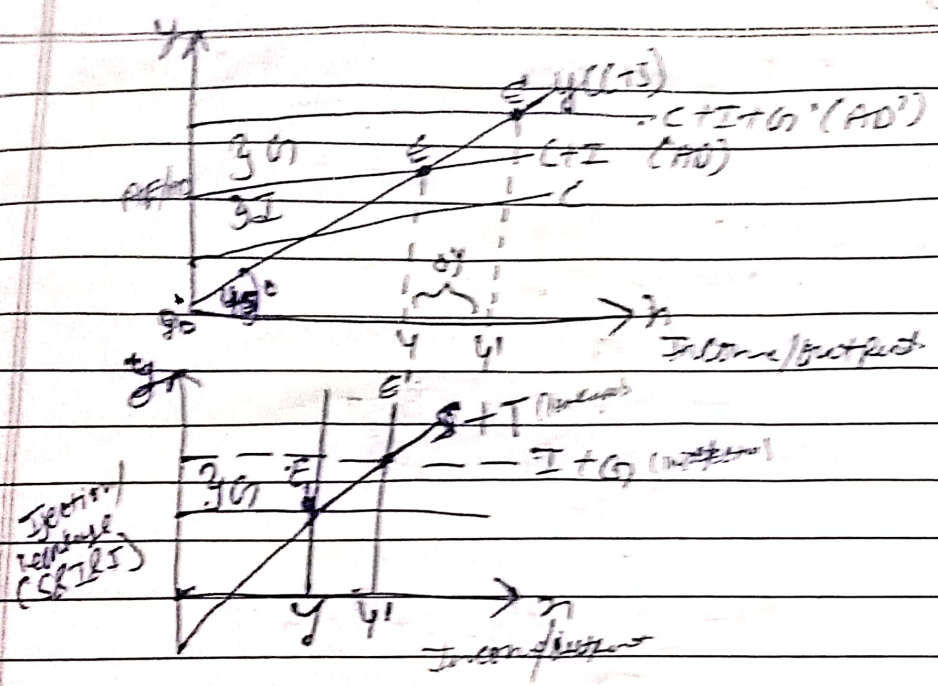
$$AS = C + S + T$$

$$\text{So, } C + I + G = C + S + T$$

Injection

Leakage





V.V. Imp

Note:- The Govt Sector and Income Determination

- Income determination with lump sum tax
Lump sum tax means tax doesn't depend on income & it is assumed that is a balanced budget i.e. $G=I$

and no transfer payments then consumption function is given as

$$C = a + bY_d$$

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

$$C = a + bY - bT$$

At eq, $Y = C + I + G$

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

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

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

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

IV Income Determination with tax (as a function of income),
Govt Expend & Transfer payments.

Conⁿ Funⁿ $\Rightarrow$

$$C = a + b(Y - \bar{T} - tY + TR)$$

At eq,

$$Y = C + I$$

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

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

Suppose $C = 100 + 0.80Y_d$

$$I = 200$$

$$T = 25 + 0.1Y$$

$$TR = 50$$

$$a = 100$$

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

$$\Rightarrow 25 + 0.1Y$$

$$0.09 = 25Y$$

$$0.036 = 3$$

$$Y = C + I + G$$

$$Y = 100 + 0.80Y_d + 200 + 25 + 0.1Y$$

$$Y - 0.80Y_d = 100 + 200 + 25 + 0.1Y$$

$$0.2Y_d - 0.1Y = 100 + 200 + 25$$

$$0.1Y = 325$$

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

$$Y = \frac{1}{1 - 0.80(1-0.1)} (100 + 0.80 \cdot 325)$$

→ Determination of Eq. Income in 4 sector economy
(HHs, Firms, Govt & foreign sector)

$$AD = C + I + G + NX$$

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

At Eq.

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

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

Note:- imports has an autonomous components $\bar{M}$ and is assumed to depend on income (Y) and marginal propensity to import.

Import function

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

Marginal propensity to import, m

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

At Eq,

$$Y = C + I + G + NX$$

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

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

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

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

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

foreign trade multiplier