

## Multiplier

\* Concept of Multiplier was firstly given by Richard Ferdinand Kahn in 1931 as, employment multiplier.

\* Prof. J. M Keynes gave the concept of Investment Multiplier.

\* Investment multiplier is the coefficient relating to an increment of investment to an increment in income.

\* Steps:- Multiplier, establishes a relationship b/w Aggregate employment, income and rate of investment gives the propensity to consume.

\* Whenever an investment is made in an economy, the effect is to increase Aggregate income, not only by the amount of original

investment, but by something more than that. This relationship is expressed as Multiplier.

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

\* Read as: change in Income, due to change in Investment.

$$Y = C + I$$

$$\Delta Y = \Delta C + \Delta I$$

Divide both sides by  $\Delta Y$ .

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

$$1 = \frac{\Delta C}{\Delta Y} + \frac{\Delta I}{\Delta Y}$$

$$1 - \frac{\Delta C}{\Delta Y} = \frac{\Delta I}{\Delta Y}$$

∴ Inverting the whole equation.

$$\frac{1}{1 - \frac{\Delta C}{\Delta Y}} = \frac{\Delta Y}{\Delta I}$$

ing more  
from bank  
is

$$\Rightarrow \frac{1}{1-MPC} = K \quad \therefore \frac{\Delta C}{\Delta Y} = \frac{1}{1-MPC}$$

(OR)

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

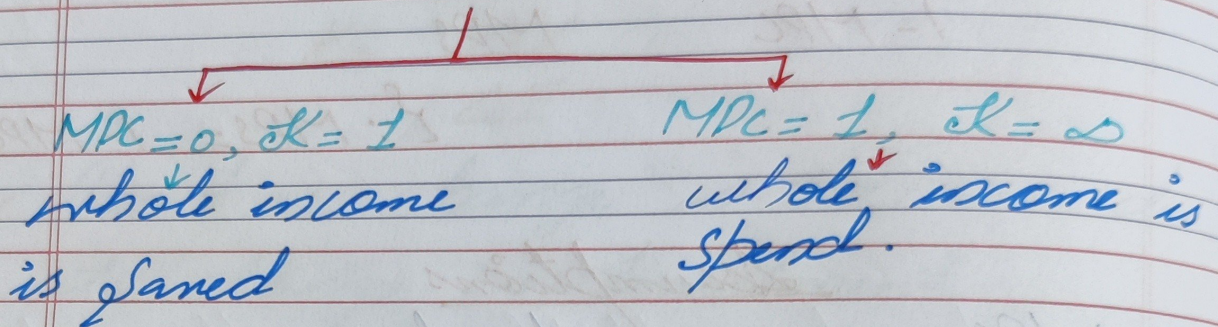
$$\therefore MPS = 1 - MPC$$

### Assumptions

1. MPC is constant.
2. No change in Prices.
3. Excess Capacity or Less than full emp.
4. Induced Investment is Absent.
5. No Time Lag, Closed economy.
6. Availability of consumer Goods.
7. No Govt. intervention.

\* Value of  $k$  is determined by MPC.

$$0 < MPC < 1.$$

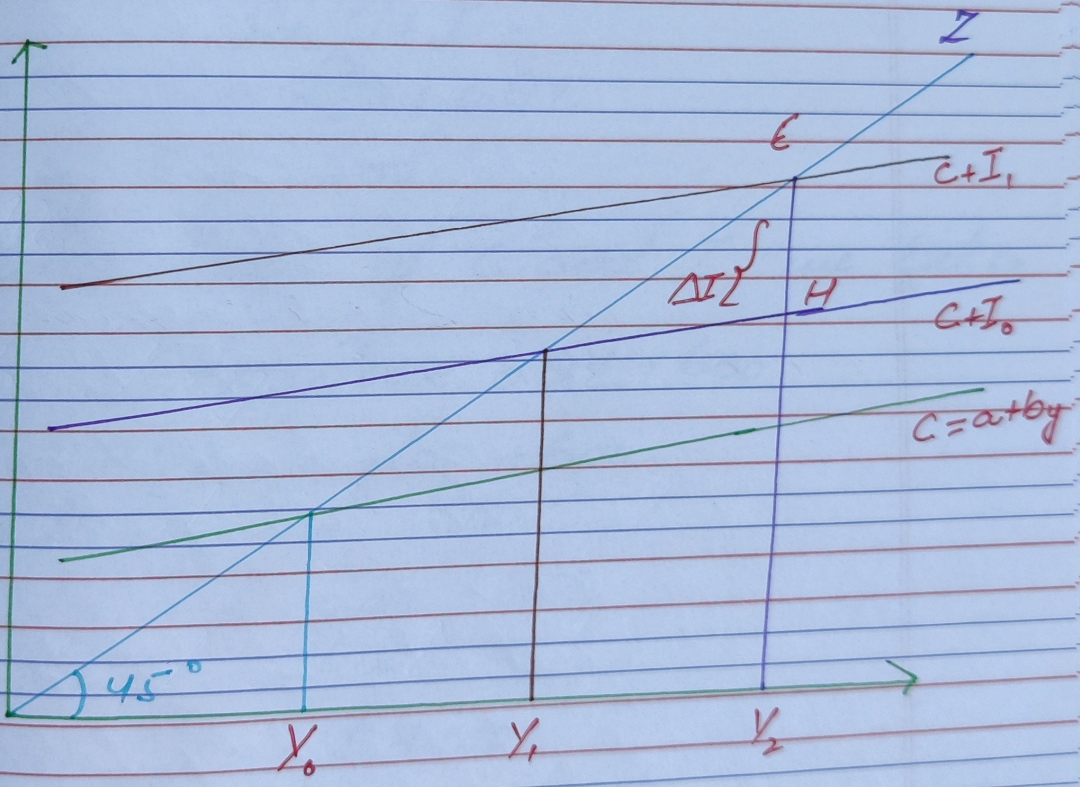


\* Higher Value of MPC means higher value of  $k$ .

| Periods | $\Delta I$ | $\Delta Y$ | MPC = 0.5<br>Change in consumption | Leakage or saving. |
|---------|------------|------------|------------------------------------|--------------------|
| 01      | 100 cr     | 100 cr     | 50 cr                              | 50 cr              |
| 02      | —          | 50 cr      | 25 cr                              | 25 cr              |
| 03      | —          | 25 cr      | 12.5 cr                            | 12.5 cr            |
| 04      | —          | 12.5 cr    | 6.25 cr                            | 6.25 cr            |
| 05      | —          | 6.25 cr    | 3.12 cr                            | 3.12 cr            |
| 06      | —          | 3.12 cr    | 1.56 cr                            | 1.56 cr            |
| 07      | —          | 1.56 cr    | 0.78 cr                            | 0.78 cr            |
| 08      | —          | 0.78 cr    | 0.39 cr                            | 0.39 cr            |
| Total   | 100 cr     | 200 cr     | 100 cr                             | 100 cr             |

Change in Investment  $\rightarrow$  Change in Income  $\rightarrow$  Change in Consumption

$\Delta I \rightarrow \Delta Y \rightarrow \Delta C \rightarrow \Delta Y$ .  $\leftarrow$  Change in Income.



**Example 1:**  $\rightarrow$  Suppose in an economy, autonomous investment is ₹ 600 or {I} and consumption function:  $\rightarrow C = 200 + 0.8Y$ . find equilibrium level of income?

$$Y = C + I$$

$$C = 200 + 0.8Y$$

$$\therefore I = 600$$

Putting value of C and I, we get:  $\rightarrow$

$$Y = 200 + 0.8Y + 600$$

$$\{Y - 0.8Y\} = 200 + 600$$

$$\Rightarrow Y \{1 - 0.8\} = 800$$

$$Y = \frac{800}{0.2}$$

$$Y = ₹ 4000$$

**Example 2:**  $\rightarrow$  Suppose level of autonomous investment is 200 crore. Saving fn is

$S = -80 + 0.25Y$ . Find equilibrium level of income?

Ans:→

$$S = I$$

$$S = -80 + 0.25Y \text{ and}$$

$$I = \text{Rs. } 200 \text{ crore.}$$

∴ substituting the value of  $S$  and  $I$ . we get:→

$$-80 + 0.25Y = 200$$

$$0.25Y = 280$$

$$Y = 280 \times \frac{100}{25}$$

$$Y = 1120 \text{ crore.}$$

(OR)

$$Y = \frac{1}{1-b} \{I + a\}$$

$$Y = \frac{1}{1-0.75} = 200 + 80$$

$$Y = \frac{1}{0.25} \times 280$$

$$Y = 1120 \text{ crores.}$$

## Determination of Income in 3 sector Model.

$$Y = C + I + G$$

↑ Investment Demand.
↓ Government expenditure

↓ Aggregate Demand
↓ Consumption

$$Y = \{a + by\} + I + G$$

$$Y = a + by + I + G$$

$$Y - by = a + I + G$$

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

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

Also,

$$Y = C + I + G$$

$$Y - C = I + G$$

$$S = I + G$$

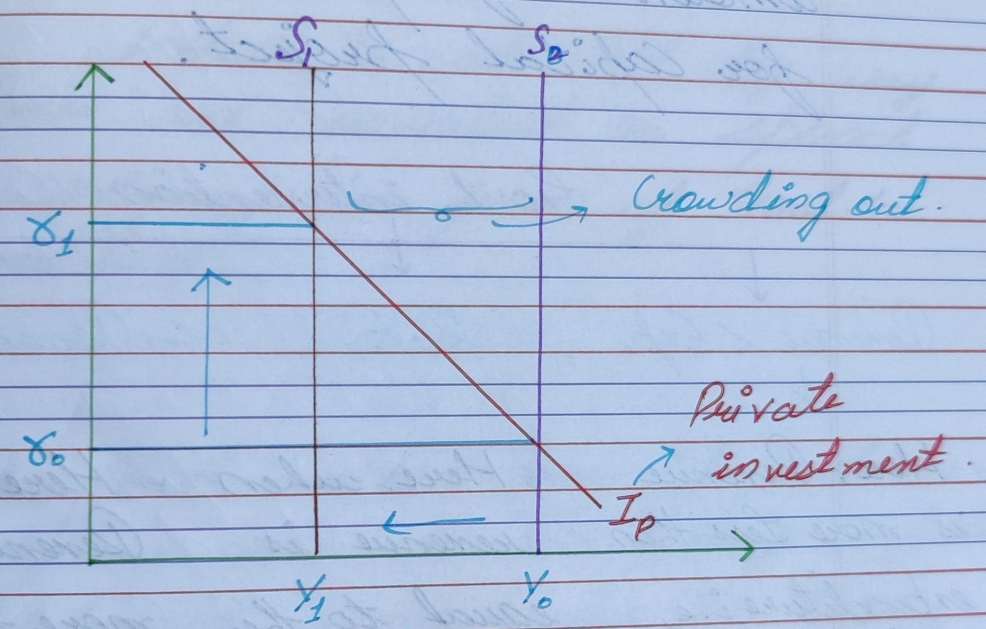
Here, Govt. imposes Taxes or can do

## Public Borrowings.

$$\text{Govt. expenditure Multiplier} = \frac{\Delta Y}{\Delta G} = \frac{1}{1-MPC}$$

- \* Govt. have the instrument to affect the Goods Market, as well as Money market in the economy.
- \* Goods Market :- Govt. affects Goods market by its "Fiscal policy" instruments i.e. Govt. Spending, Taxes and public borrowing etc.
- \* Money Market :- Govt. affects money market by its Monetary policy instruments i.e. LAF, MSF, Repo etc and impacts on the Money Supply in an economy.
- \* If Govt. borrows from financial

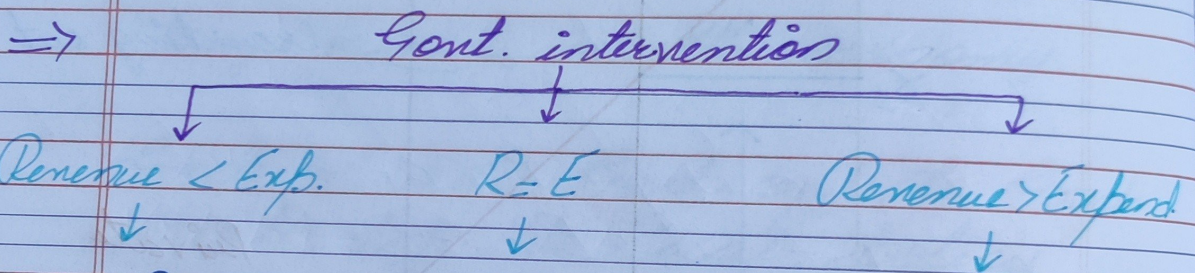
institutions as Public borrowing. Then, some of Private investment always crowds-out as of rate of interest high and Investment low & induced investment's.



\* The crowding out effect is an economic theory that states that increased Govt. spending effectively reduces Total private spending.

\* Increase in Govt. spending causes higher demand for capital in the

market. The higher demand for capital causes a rise in ROI and Rise in ROI rates makes private borrowing more costly, thus reducing the amount of private borrowings for capital project.



- \* Here, Revenue is more less than expenditure i.e., Taxes are low, results in high MPC i.e., expenditure more. results in More National are Spend on income increase. Public Goods.
- \* Here, when revenue is equal to the expenditure i.e., Balance B/W Revenue & expenditures, i.e., Taxes collected
- \* Here, we have Revenue receipts more than expenditure receipts. i.e., Taxes are collected more, results in Low MPC, that results in Low National income