

DETERMINATION OF INCOME AND EMPLOYMENT

The main problem of macro economic is to determine the level of income and employment in an economy. This can be determined with the help of Keynesian theory of income and employment.

According to him national income is determined at a point where aggregate demand to equal to aggregate supply. but it is not necessary that it is on the point of full employment.

Keynesian school:- Unemployment will not disappear automatically. Te govt. must intervene. it should undertake investment expenditure to generate opportunities of employment. Equilibrium with full employment is no tan automatic phenomenon.

Keynesian Theory can be explained with the help of two important components :-

- 1) Aggregate Demand (AD)
 - 2) Aggregate supply (AS)
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- 1) Aggregate Demand :- Aggregate demand refers to the sum total of demand for all goods and services in the economy during the period of an accounting year.

AD can be discussed in the following components :-

- 1) C (Private consumption expenditure) :- it is also called household consumption expenditure. It is the demand for all goods and services by the households of a country during an accounting year. It depends upon the level of personal disposable income of the consumer. Higher the level of personal disposable income, higher is private consumption expenditure and vice-versa.
- 2) I (Private investment Expenditure) :- It refers to expenditure by private investors on the purchase of capital goods which leads to increase in the stock of capital goods or capital formation. It is mainly depends upon the market rate of interest. Higher rate of interest causes lower investment expenditure.
- 3) G (Government expenditure) :- It include both govt. consumption expenditure and govt. investment expenditure. Govt. consumption expenditure is the expenditure on the purchase of various goods & services. Govt. investment expenditure is the expenditure incurred on providing various public services to the people like law and order, defense, construction of roads, dams.
- 4) X-M (Net Exports) :- This is the difference between exports and imports of goods in an economy. exports is the expenditure of non-residents on the Indian made goods whereas imports are the expenditure of Indian residents on foreign made goods

AD [From the point of view of measurement] = $C + I + G + (X - M)$

AD [From the point of view of determination] = $C + I$

2. Aggregate supply (AS) :- This is the total supply of goods and services in an economy by all the producers during an accounting year.

As is equal to national income this is because as is given by all the producers with the help of factors of prod" in the form of rent, interest, wages and profit. this is equal to national income which can be used either for consumption or for saving.

$$AS = R + I + W + P = NY = C + S$$

OR

$$AS = C + S$$

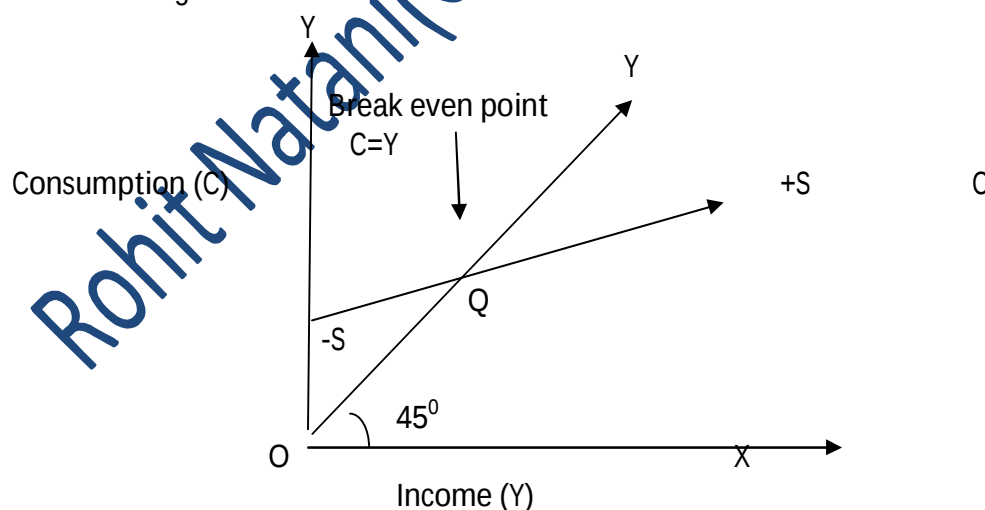
Equilibrium level of Income or output

Equilibrium condition :-

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

Three type of function :-

- 1) Consumption function:- It is the relation between consumption and income. Consumption expenditure increases with the increase in income and vice-versa. It increases at a proportionate rate since a part of the income is diverted towards the savings.



- 1) OC is the minimum level of consumption. It must be incurred even when income (Y) = 0. Because survival needs consumption.

- 2) CC line (or consumption function line) constantly moves up : showing a rise in consumption as income rises.
- 3) $C = Y$ at point Q, i.e. break even point.
Prior to Q, $C > Y$, Pointing to +S

Propensity to consume is the relationship between consumption and disposable income of the household.

It refers to the schedule which shows the level of consumption at different levels of incomes in an economy.

It can be discussed in two parts :-

- 1) APC :- average propensity to consume :- It is the ratio between total consumption and total income of the households.

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

- 2) MPC :- Marginal propensity to consume :- It is the ratio between change in consumption and change in income of the household.

$$MPC = \frac{\text{Change in consumption}}{\text{Change in income}}$$

OR

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

Consumption equation:- $C = \bar{C} + by$

$\bar{C}$ = Consumption

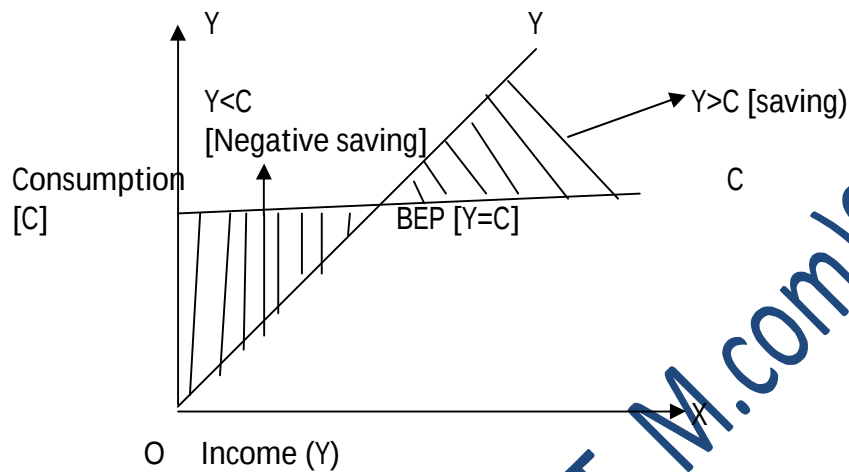
$\bar{C}$ = Minimum level of consumption/ constant consumption or it is the autonomous consumption which is necessary for the survival of the consumer.

b = MPC

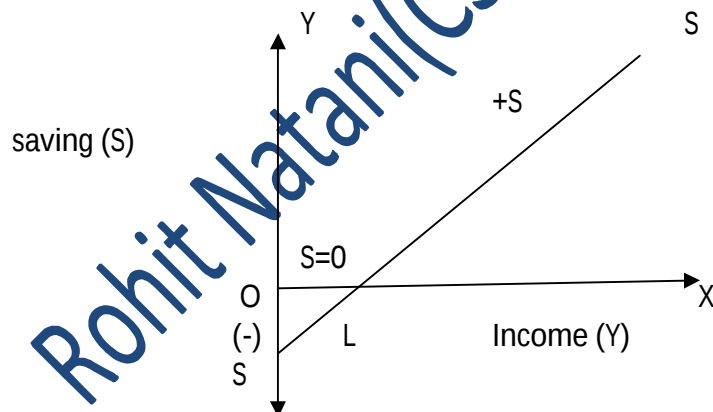
y = Income

$$C = 50 + 0.75y$$

Y	C	
0	50	Y < C (Negative saving)
100	125	
200	200	Y = C (BEP)
300	275	Y > C (Savings)
400	350	
500	425	



- 2) Saving function:- It is the relation between saving and income. Higher the income higher the saving and vice-versa. It depends upon the disposal income of the consumer and consumer desire to save.



- 1) SS is the saving function. it is the straight line moving upwards. it shows positive relationship between Y and S i.e. S increases as Y increases.

- 2) $S=0$ when $Y = OL$. It is a situation when $Y = C$ i.e. BEP
- 3) Beyond point L ; S is positive
- 4) Prior to point L ; S is negative. it is a situation of withdrawal from the post saving.
- 5) OS is negative saving. It is also equal to the minimum level of consumption since it is incurred even when $(Y) = 0$.

Propensity to save is the relationship between savings and income of the household.

OR

It refers to the schedule which shows the amount that will be saved at different levels of incomes.

It can be discussed in two parts :-

- 1) APS :- Average propensity to save :- This is the ratio b/w total saving and total income of the household.

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

- 2) MPS :- Marginal propensity to save:- This is the ratio b/w change in saving to change in income of the household.

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

Saving equation :-

$$S = -\bar{S} + sY$$

$\bar{S}$ = Saving

$\bar{S}$ = Constant saving (or saving when $Y=0$)

s = Marginal propensity to save

Y = Income

- $\bar{S}$ is simply the negative expression of $\bar{C}$ (minimum C)

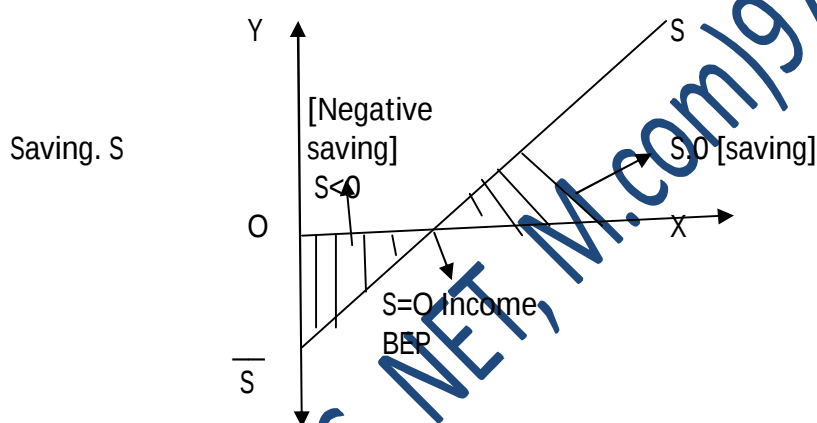
For example :- If minimum $C = 50$ (when $Y=0$)

then $-S = -50$ (when $Y=0$)

$$C = 50 + 0.75Y$$

$$S = -50 + 0.25Y$$

Y	S	
0	-50	} $S < 0$ [negative saving]
100	-25	
200	0	} $S = 0$ [BEP]
300	25	} $S > 0$ [Saving]
400	50	
500	75	



Relationship between consumption and saving function :-

$$Y = C + S$$

$$C = Y - S$$

$$S = Y - C$$

$$APC + APS = 1 \text{ or}$$

$$APS = 1 - APC \text{ or}$$

$$APS = 1 - APC$$

Relationship between APC and APS

$$APC + APS = 1$$

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

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

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

Y

Relationship between MPC and MPS

$$\Delta Y = \Delta C + \Delta S \quad \text{or}$$

$$\Delta C = \Delta Y - \Delta S \quad \text{or}$$

$$\Delta S = \Delta Y - \Delta C$$

$$MPC + MPS = 1 \quad \text{or}$$

$$MPC = 1 - MPS \quad \text{or}$$

$$MPS = 1 - MPC$$

$$MPC + MPS = 1$$

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

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

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

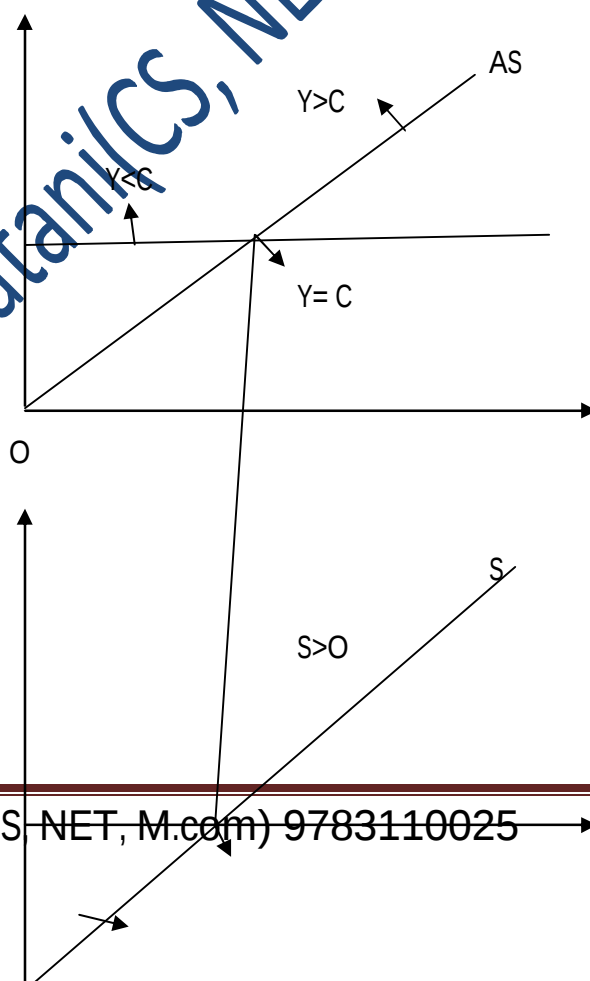
$$S = Y - C$$

$$S = Y - (C + by)$$

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

consumption
function

Saving
Function



O

$S=0$ Income

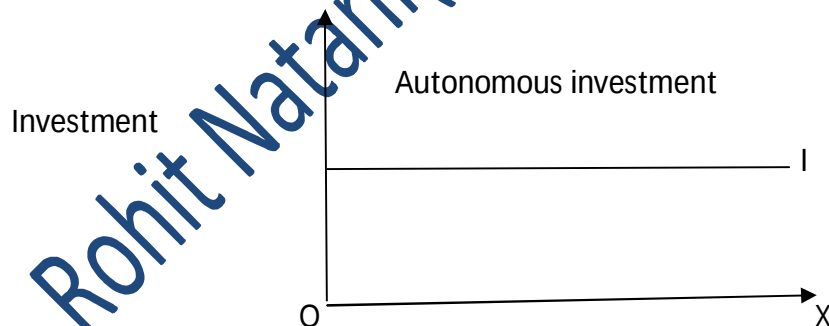
$S < 0$

Y	C	S	APC	APS	MPC	MPS
0	50	-50	∞	-	-	-
100	125	-25	1.25	-0.25	0.75	0.25
200	200	00	1	0	0.75	0.25
300	275	25	0.91	0.09	0.75	0.25
400	350	50	0.87	0.13	0.75	0.25
500	425	75	0.85	0.15	0.75	0.25

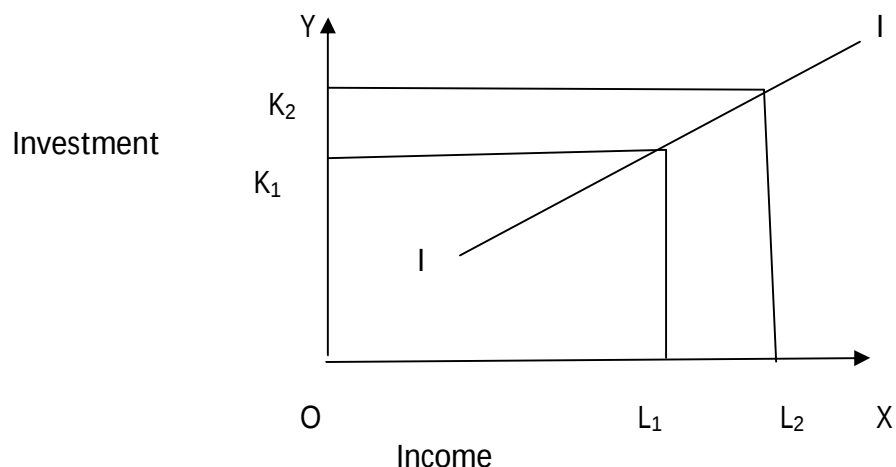
1) Investment function :- Investment refers to the expenditure incurred on the purchase of capital goods in an economy during an according year. It includes fixed capital as well as inventories. It is two types:-

a) Autonomous Investment :- It is an investment which is not influenced by expected probability or level of income. It is done by the govt. With a social welfare motive an not the profit motive . Such investment remains unaffected whatever be the level of income.

For eg:- expenditure on roads, dams, bridges, water and electricity and etc.



b) Induced Investment:- It is an investment which is positively related to the level of income in an economy. Higher the level of income higher the consumption expenditure. It is influenced by expected profitability of the producers which induces then to make grater investment.

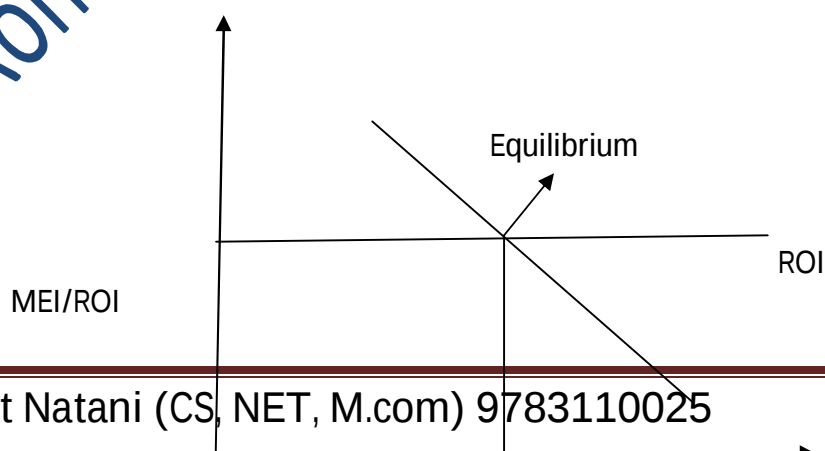


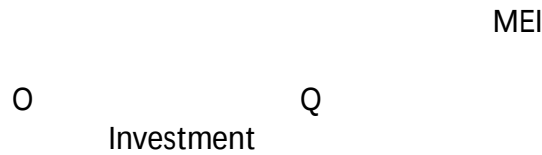
Such investment depends upon two factors :-

- 1) Marginal efficiency of investment:- It is the expected rate of return from the additional unit of investment. For eg:- Rs. 20 return is expected from the investment of Rs. 100, then we can say that MEI is 20%.
- 2) Rate of interest (ROI) :- It is the cost of borrowing the funds which an investor has to pay on the borrowed funds.

Relationship between MEI and ROI

Investment	MEI	ROI.
100	20%	10%
200	17%	10%
300	15%	10%
400	12%	10%
500	10%	10%
600	7%	10%





- When MEI is greater than ROI, then investment demand increases.
- When MEI is less than ROI, then investment demand falls.
- When MEI is equal to ROI, then investment demand is determined.

Multiplier / Investment Multiplier :- It is a ratio between change in income and change in investment .

$$K = \frac{\Delta Y}{\Delta I} \dots\dots\dots \text{eq 1.}$$

Here K = multiplier
 ΔY = increase in output/ income/
 ΔI = increase in investment .

$$\begin{aligned} Y &= C + I \\ \Delta Y &= \Delta C + \Delta I. \\ \Delta I &= \Delta Y - \Delta C \end{aligned}$$

Put the value of ΔI in eq.....1.

$$K = \frac{\Delta Y}{\Delta Y - \Delta C} \dots\dots\dots \text{eq.2.}$$

Divide the eq.. 2 by ΔY

$$\begin{aligned} K &= \frac{\Delta Y}{\Delta Y} \\ \frac{\Delta Y}{\Delta Y} &= \frac{\Delta C}{\Delta Y} \end{aligned}$$

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

$$K = \frac{1}{1 - MPC} \quad \left[MPC = \frac{\Delta C}{\Delta Y} \right]$$

$$K = \frac{1}{MPS} \quad \left[MPS = 1 - MPC \right]$$

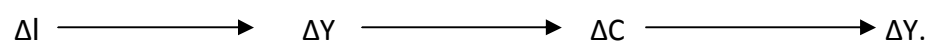
Relationship between multiplier and MPC :-

- There is a direct relation between multiplier and MPC i.e. larger the MPC, larger the multiplier and vice-versa.
- If MPC is more then large portion of income is spend on consumption. As a result income of some other people will increase.
- The latter will also spend some part of the increased income on consumption which will cause the income of other people to increase.
- Thus the value of this increase in income i.e. multiplier, depends up on MPC.
- Higher the MPC, greater the value of multiplier and hence greater the increase in income.

Working of a multiplier.

ΔI	MPC	Period	ΔY	ΔC	ΔS
10	0.50	I	10	5	5
		II	5	2.5	2.5
		III	2.5	1.25	1.25
		IV	1.25	0.625	0.625
		V	0.625	0.31	0.31
		VI	0.31	0.15	0.15
		VII	0.15	0.075	0.075

Multiplier Process:-



Change in investment cause change in income. As a result there is change in consumption. Consumption exp of one person is an income of the other. Hence, change in consumption leads to change in income.

- 1) With the increase in investment multiplier increases income many times more. It is called forward action of the multiplier
- 2) With the decrease in investment multiplier decreases income many times more. It is called backward action of the multiplier.

Full employment:- It is a situation in which all those who are able to work and are willing to work at the existing wage rate are getting work.

Situation of full employment does not mean a situation of zero unemployment, it is a situation in which there does exist natural rate of unemployment.

Natural rate of unemployment :- It occurs due to

- Time required in shifting from one job to the other
- Time required in adjusting to change in technology.

Frictional unemployment :- It is the unemployment associated with the changing of jobs in dynamic economy.

Structural unemployment :- It is the unemployment associated with the structural changes in the economy i.e. change in technique of production.

Voluntary unemployment :- It is a situation in which people are not willing to work at the existing wage rate, even when work is available.

Involuntary unemployment :- It is a situation in which people are able to work and willing to work at existing rate of wages but do not get work.

NOTE:-

Voluntary unemployment is not considered while measuring the size of unemployment in a country.

EX- ante saving is what the savers plan to save (Or intend to save) at different levels of income in the economy.

EX:- Ante investment is what the investors plan to invest (or intend to invest) at different levels of income in the economy.

EX:- post saving and investment :- It refers to the realized saving and investment in the economy.

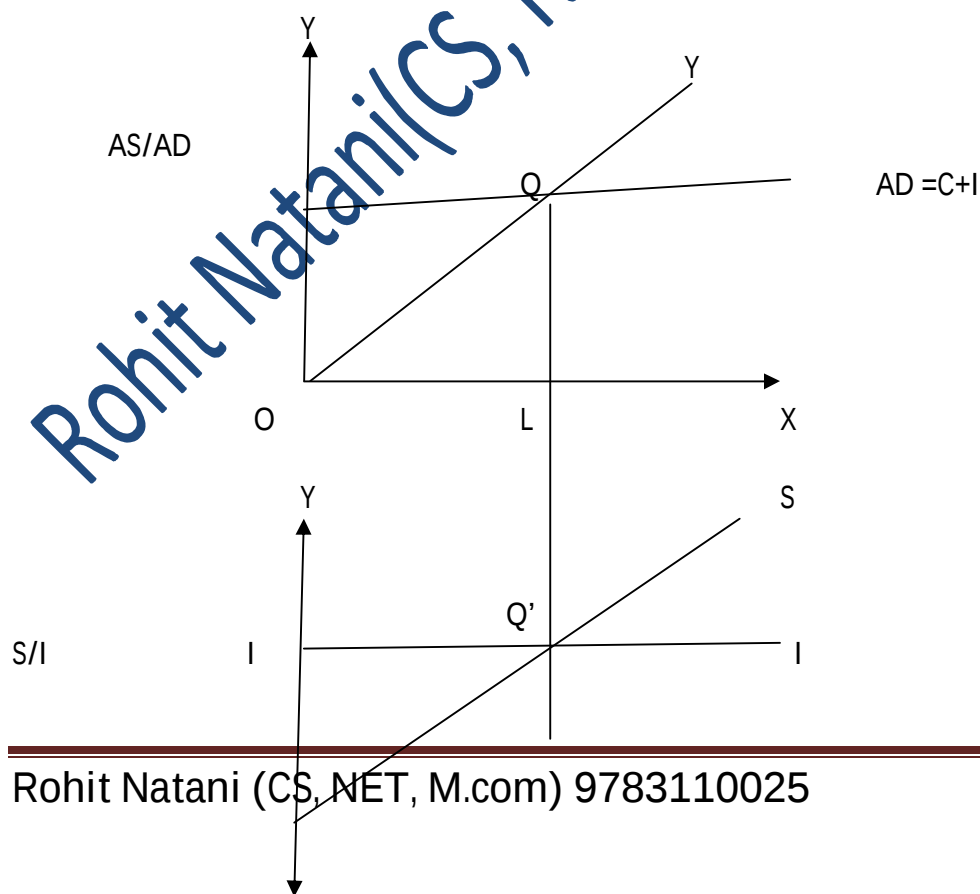
EX:- post S = EX post I as a matter of accounting identity.

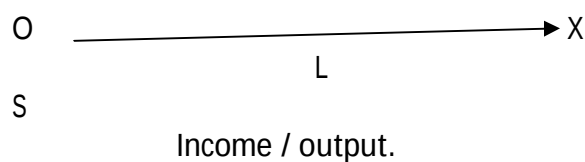
Determination of income and employment.

N = no. Of people

Y= Income

N	Y	C	S	I	AD [C+I]	AS[C+S]	Direction of change
0	0	50	-50	50	100	0	AD>AS Income increases
10	100	125	-25	50	175	100	
20	200	200	0	50	250	200	
30	300	275	25	50	325	300	
40	400	350	50	50	400	400	AD=AS[equal]
50	500	425	75	50	475	500	AD<AS income decreases
60	600	500	100	50	550	600	





Equilibrium is determined at point 'Q', when $AS = AD$ and at point 'Q', when $S = I$.

OL is the equilibrium level of income output or employment .

Equality between AS and AD at point Q implies the equality between S and I at point Q'.