



# **Determination of Income and Employment**

# **Income Determination**

**In Macro Economics we study how income and employment are determined in a country. Keynes has made an important Contribution in this field as "Keynesian Theory of income and Employment". According to Keynes in economy, income and employment is determined on the basis of two component (1) Aggregate Demand and aggregate supply.**

### **AGGREGATE DEMAND (AD)**

**Aggregate demand refers to the total demand for final goods and services in an economy during a year.**

### **Components of Aggregate Demand**

**The main Components of aggregate demand are as follows.**

- 1. Private (or Household) Consumption demand (c)**
- 2. Private Investment demand (I)**
- 3. Demand for goods and services by the government purchases (G) and**
- 4. Demand for Net Export (NE = X-M)**

**AD: C+I+G+NE**

**1. Private (or Households) Consumption demand - The total expenditure incurred by all the households of the country on their personal consumption is called private consumption demand. Consumption demand depends mainly on disposable income and propensity to consume (consumption function).**

**2. Private Investment Demand- Private Investment demand refers to the demand for capital goods by the private Investors. In Keynesian terminology, investment means addition to the existing stock of real capital assets such as machinery, tools and implement, factory building, inventories etc. Investment demand in a country depends on Investment function or inducement to Invest. Inducement to invest also depends on two factors: marginal efficiency of investment and**

rate of interest.

**3. Demand for goods and services by the government (or government Purchases):** - We know that government purchases a variety of goods and services in a country. Government's purchase of goods and services indicates government's demand for goods and services. It comes for the satisfaction of collective wants, e.g. roads, railways, canals, dams, electricity, water supply, provision of educations, health, law and order, security and government administration etc.

**4. Demand for Net Exports:** - Net exports demand is equal to the exports minus imports. Exports of goods indicates the demand for country's goods by the foreigners. Exports of goods strengthens the income, output and employment process of the country. On the other hand, when we import goods from other countries, it drives out the earning of the country.

$$NE = X (\text{Export}) - M (\text{Import})$$

Net export demand can both be positive as well as negative. When exports exceed imports, net export is positive and when imports exceeds exports, net export is negative. Exports and imports of a country are influenced by a number of factors such as foreign trade policy, exchange rates, prices and quality of goods etc.

In the two-sector economy, according to Keynes, aggregate demand consist of consumption demand and investment demand

$$AD = C + I$$

**Aggregate Demand = Consumption Demand + Investment Demand**

**(a) consumption Demand:** It refers to the demand for goods and services for private consumption and it is made by the household

sector. It is also called private final consumption or consumption expenditure. The consumption demand is influenced by many factors such as price of the goods and services, income, wealth, expected income, tastes and preferences of individuals and so on.

Keynes had formulated his law of consumption to explain the relationship of income and consumption. This relationship between consumption and income is called consumption function.

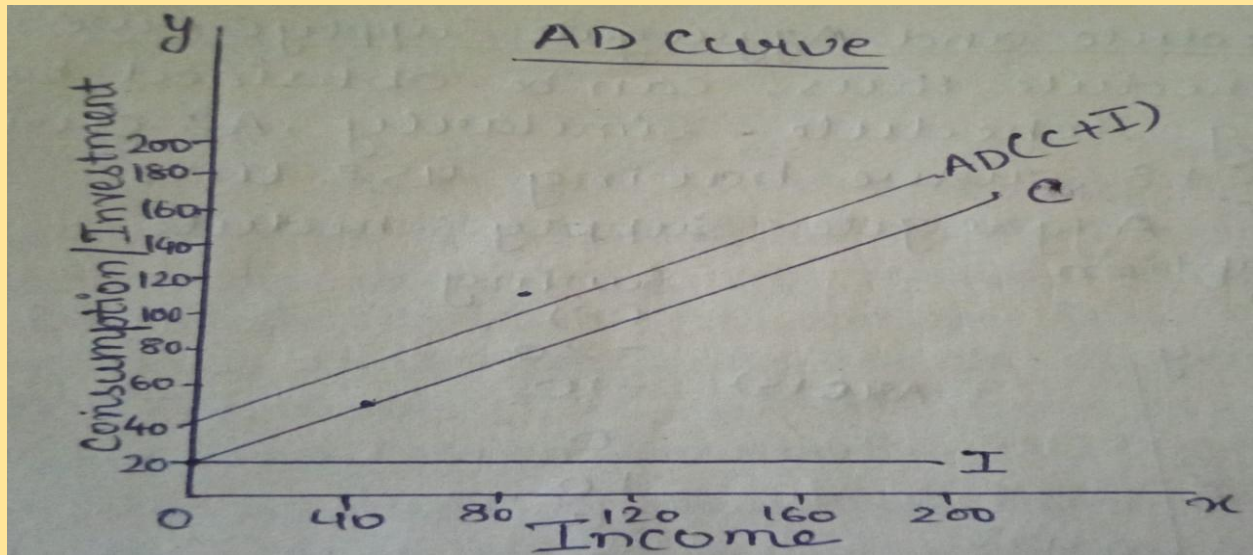
**(b) Investment Demand:** Demand for private investment refers to planned investment expenditure by the firm. The investment demand includes the stock of physical capital and change in inventory.

### **AD SCHEDULE AND AD CURVE**

#### **Aggregate demand schedule**

<b>Income (Y)</b>	<b>Consumption (C)</b>	<b>Investment (I)</b>	<b>Aggregate Demand (AD = C+I)</b>
0	20	20	40
40	50	20	70
80	80	20	100
120	110	20	130
160	140	20	160
200	170	20	190

#### **AD Curve**



In an economy, aggregate demand (or aggregate expenditure) is equal consumption demand plus investment demand. Hence, aggregate demand schedule can be obtained by adding consumption demand Schedule and investment demand schedule.

The graphical representation of aggregate demand schedule gives us aggregate demand curve. Aggregate demand curve can also be obtained by adding consumption demand curve and investment demand curve.

From AD Schedule and AD curve, it is clear that aggregate demand increases with the increase in income.

### AGGREGATE SUPPLY (AS)

Aggregate supply refers to the total quantity of goods and services produced by all the producers in an economy during a year. Aggregate supply depends on the producer's output.

We know that various factor of production, such as land, labour,

capital and enterprise are required for production of goods and services. Producers make payment to the factor of production for the production for the render for their services in production.

Thus, aggregate supply is total amount of money which is paid to the factors of production against their factor-services for the production of goods and services in a country.

### Components of Aggregate supply

The main components of aggregate supply are rent, wages, Interest and profit.

**Aggregate Supply = Factor income = Rent +wages + interest + Profit**

The income earned from factor of production is either consumed or saved, hence two main constituents of aggregate supply: Consumption and Saving.

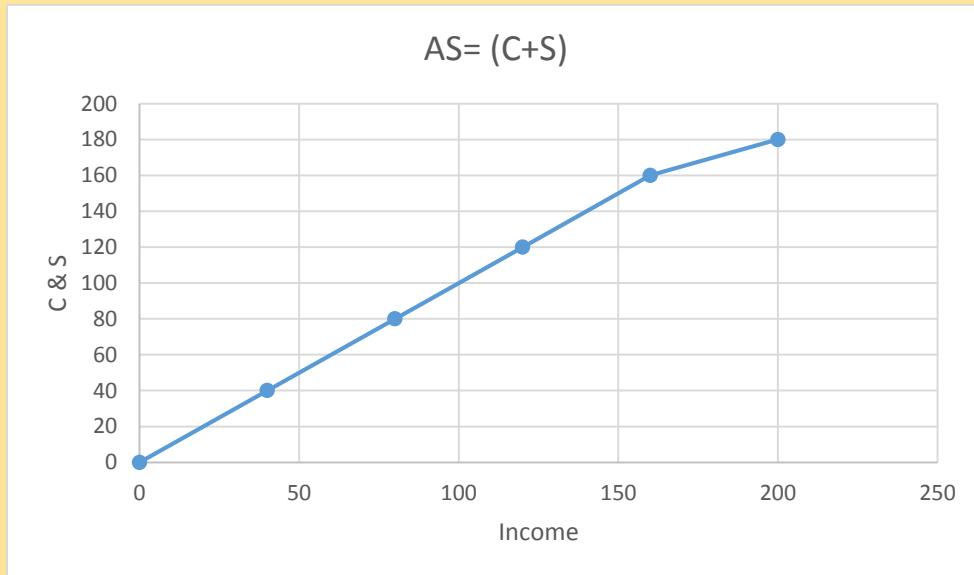
$$AS = C+S$$

### Aggregate Supply Schedule and Aggregate Supply Curve

Aggregate Supply schedule thus, can be obtained by adding consumption schedule and saving schedule. Similarly, AS curve can be shown in the diagram as C +S curve having 45° line.

Income (Y)	Consumption (c)	Savings (S)	AS (C+ I)
0	20	-20	0
40	50	-10	40

<b>80</b>	<b>80</b>	<b>0</b>	<b>80</b>
<b>120</b>	<b>110</b>	<b>10</b>	<b>120</b>
<b>160</b>	<b>140</b>	<b>20</b>	<b>160</b>
<b>200</b>	<b>170</b>	<b>30</b>	<b>180</b>



## **CONSUMPTION-FUNCTION OR PROPENSITY TO CONSUME**

### **Meaning of Consumption function or propensity to consume**

### **Meaning of Consumption function**

**Consumption function (or propensity to consume) means a functional relationship between total consumption and total disposable income.**

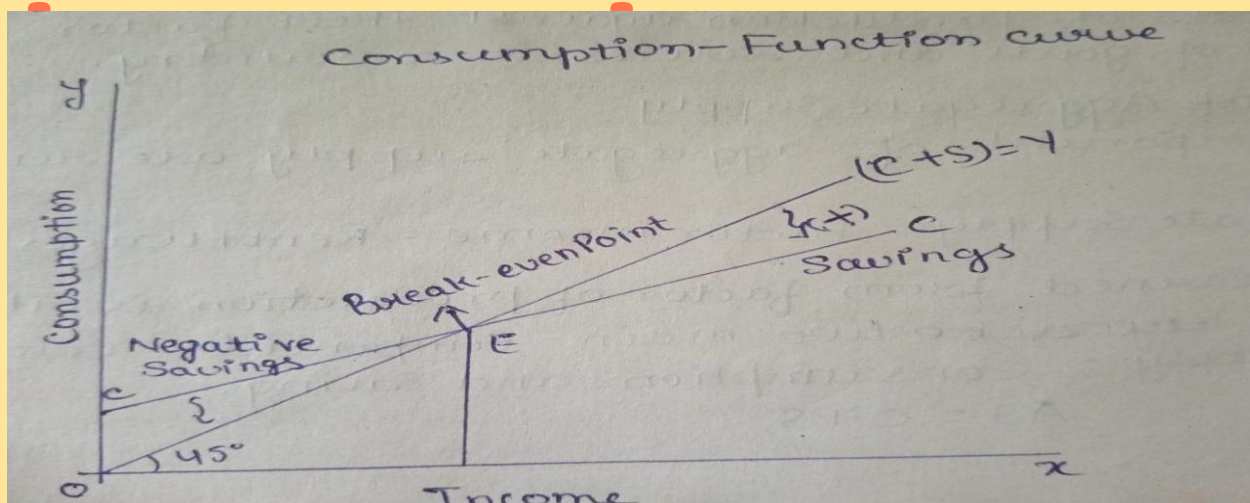
$$C = f(y)$$

**Here, C = Consumption**

**Y = Disposable income.**

On the bases of this income- consumption relationship, Keynes gives his famous law of consumption. The law of consumption states that as income increases, consumption also increases, but less than the increase in Income. Consumption function schedule exhibits the law of consumption.

<b>Disposable income (Y)</b>	<b>0</b>	<b>40</b>	<b>80</b>	<b>120</b>	<b>160</b>	<b>200</b>
<b>Consumption (C)</b>	<b>20</b>	<b>50</b>	<b>80</b>	<b>110</b>	<b>140</b>	<b>170</b>



From Schedule and diagram it is clear that, as income increases, consumption also increases, but the increase in consumption remains less than the increase in income. Consumption-function schedule tells us that when income is zero, consumption does not remain zero. This indicates that there is a minimum level of consumption in every country. It means that the people of a country would definitely consume a minimum amount of goods and services which is required for their existence even when country's income is zero.



Further when income increases to Rs. 40 crores, consumption becomes Rs. 50 crores. In both the situations, consumption is greater than income which means negative savings. The people of this country would fulfill their consumption demand either by reducing old savings this country or by taking loans or receiving grants from other countries of the world. When income increases to Rs 80 crores, consumption also reach this level i.e. 80 crores. Here both income and consumption become equal and saving becomes zero; this is known as breakeven point. This is shown by E point in the diagram.

Thus, breakeven point indicates a point where consumption becomes equal to income or consumption curve cuts the income curve.

Thereafter, when income increases to Rs. 120 crores, consumption increases to Rs. 110 crores. In this situation, total consumption is less than the income, hence there is positive savings.

## **KIND OF PROPENSITY TO CONSUME**

### **1. Average propensity to consume (APC)**

Average propensity to consume is defined as the ratio of total consumption to total income. To estimate it, we divide Consumption by the income.

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

Here APC = Average propensity to consume

C= Total Consumption

Y = Total income

**The Value of APC can never be negative because the level of total consumption cannot be negative at any level of income.**

## **2. Marginal Propensity to consume (MPC)**

**Marginal propensity to consume as the ratio of the change in consumption to the change in Income. To calculate it, we divide in consumption by change in income**

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

**$\Delta C$  = Change in consumption**

**$\Delta Y$  = Change in income**

### **Saving Function or Propensity to save**

**Savings are defined as the income which are not spent on consumption. Hence, Savings Can be obtained by deducting consumption from income**

$$\text{S} = \text{Y} - \text{C}$$

**Saving function (or Propensity to save) is a schedule showing a functional relationship between total saving and total income.**

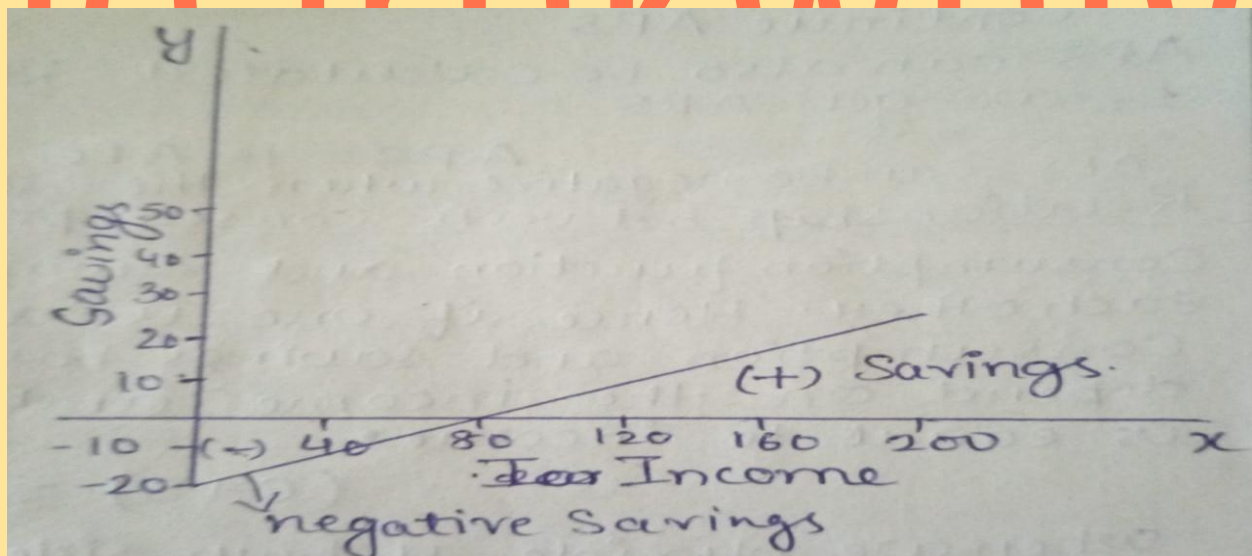
$$\text{S} = f(\text{Y})$$

**S = Savings Y = income.**

Since saving is calculated by deducting consumption from income, saving function is also obtained from consumption function.

$$S = Y - C$$

Income (Y)	Consumption (c)	Savings (S)
0	20	-20
40	50	-10
80	80	0
120	110	10
160	140	20
200	170	30



From the saving function schedule and the diagram that as the income increases saving also increases. Saving can both be negative as well as positive. Before the breakeven point saving is negative, at breakeven point saving is zero and after the breakeven point saving

becomes positive.

### **Average Propensity to Save**

**Average propensity to save means the ratio of total savings to total income. In other words, when we divide saving by income get average propensity to save.**

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

**S Saving**

**Y= Total income**

### **Marginal Propensity to Save**

**Marginal propensity to save is the ratio of savings to the change in income.**

$$\text{MRS} = \frac{\Delta S}{\Delta Y}$$

**$\Delta S$  = Change in savings**

**$\Delta Y$  = Change in income**

**In other words; when we divide change in savings by change in income we get marginal propensity to save.**

**MPS can be calculated from MPC also. If we deduct MPC from 1 then we also get MPS**

**MPS = 1-MPC.**

### **CONCEPT OF MULTIPLIER**

**The level of investment play an important role in the determination of income and output. Therefore, a change in investment affects the level of investment play the level of income, output and employment in the economy. When there is investment, it increases the productive capacity of an economy and therefore output and employment also increases. On the other hand, a decrease in investment decreases the productive capacity, Output and employment in the economy. In order to estimate the impact of change in investment on income Keynes introduced a concept of multiplier. Keynes has termed it as investment multiplier'. It is called investment multiplier because it tells us that increase in investment is essential for the increase in income or increase in income become possible as a result of increase in investment.**

### **Meaning and Definition of Multiplier**

**Keynes tell us that whatever investment is increased in a country, income does not increase only to the extent of increase in investment but many times over the increase in investment is termed as investment multiplier by Keynes.**

**According to Dillard," Investment multiplier is the ratio of an increase of income to a given increase in investment.**

**In short, Multiplier means the ratio of change in income to the change in investment**

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

**Multiplier = Change in income / change in investment**

**If the value of the multiplier is given, we can calculate the increase in**

**income as a result of increase in investment**

$$\Delta Y = K \times \Delta I$$

### **Relationship between MPC and multiplier**

**The value of multiplier is determined by marginal propensity to consume. Furthermore, the size of the multiplier varies directly with the size of MPC. Greater the size of the MPC, higher the value of multiplier and smaller the size of MPC lower the value of multiplier.**

### **DETERMINATION OF EQUILIBRIUM LEVEL OF INCOME AND OUTPUT**

**After analysing the concept of aggregate demand and aggregate supply, it is easy to determine equilibrium level of income and output in an economy. In this regard there are two approaches:**

- (i) AD-AS approach or consumption plus investment approach, and**
- (ii) Saving and investment approach.**

$$AD = C+I$$

$$AS = C+S$$

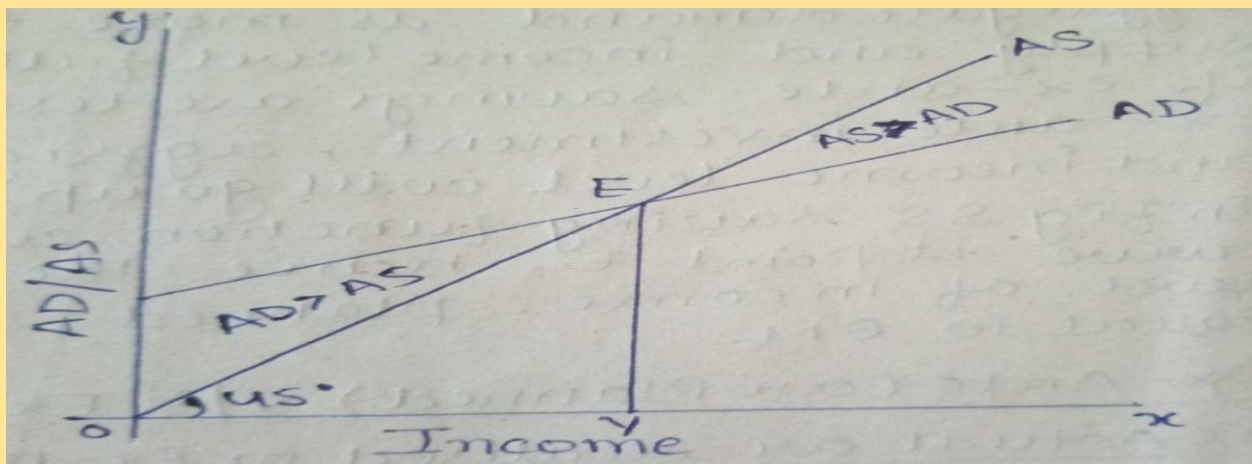
$$\text{If } AD = AS$$

$$C+ I = C+S$$

$$S = I$$

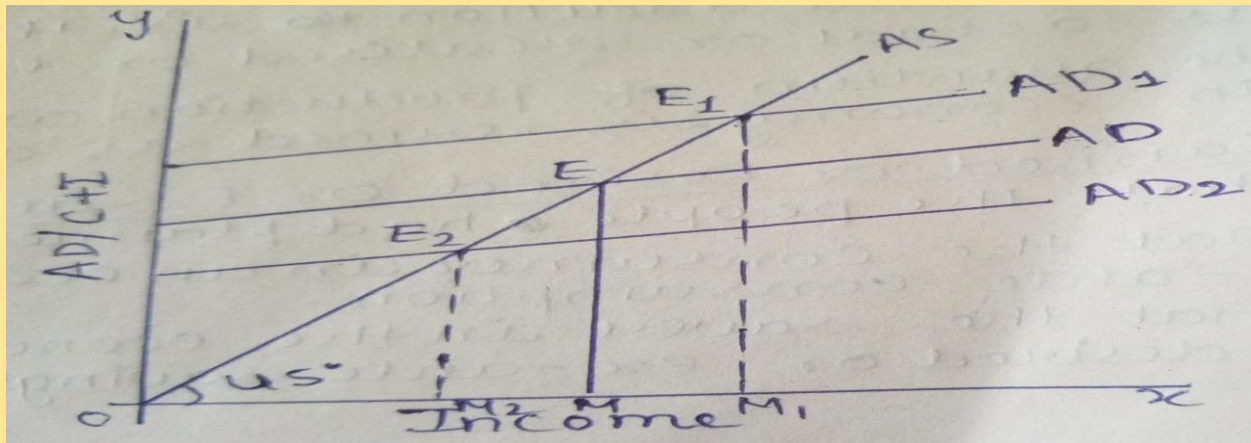
### AD- AS Approach (C+I Approach)

According to Keynes, the equilibrium level of national income and Output is determined where aggregate demand is equal to the aggregate supply. If aggregate demand is less than aggregate supply, there will be a tendency of decrease in production and national income. Similarly, if the aggregate demand is more than the AS there will be a tendency of increase in production and national income.



In fig, AD represent aggregate demand Curve and AS represent aggregate supply curve. Equilibrium level of income Y is determined at point E, where AD curve intersect AS ( $AD=AS$ ). Hence, E indicates equilibrium Point. Before E point, aggregate demand will exceed aggregate supply leading to an increase in level of income to point E. Beyond point E, aggregate supply will exceed aggregate demand leading to fall in income back towards point E.

## Impact of Increase or Decrease in Aggregate demand



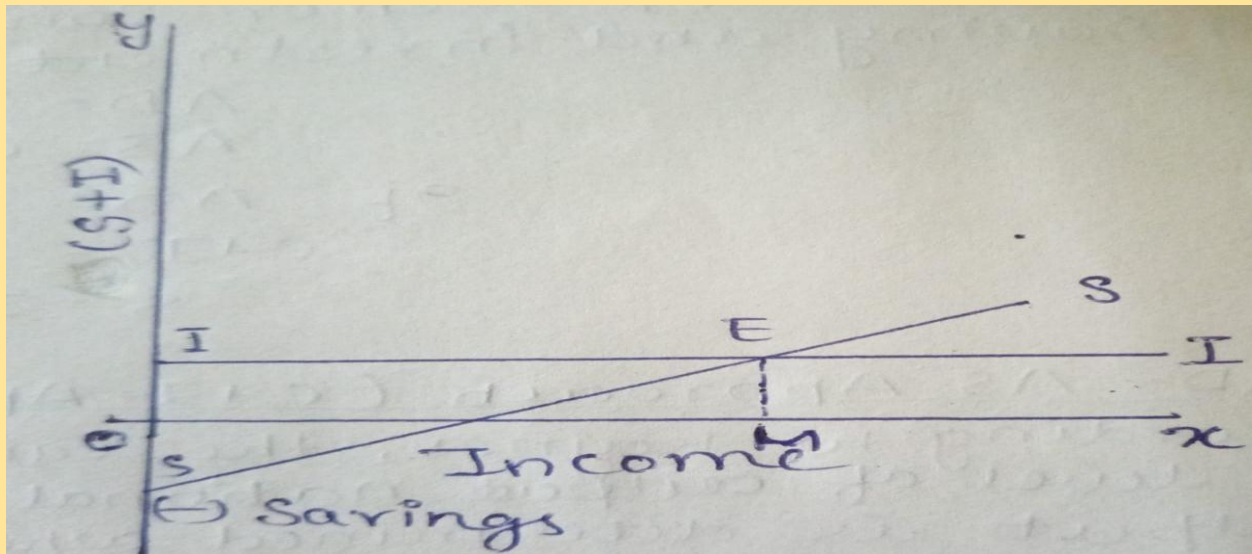
Given AS, equilibrium level of output and Income increase with the increase in aggregate demand and decreases with the decrease in aggregate demand. The diagram demonstrates that when AD curve intersect AS line at E, the OM is the equilibrium level of output. When there is increase in Aggregate demand, the new AD<sub>1</sub> curve intersect AS curve at E<sub>1</sub>. Now the equilibrium level of output increases to OM<sub>1</sub>. Similarly, when there is decrease in aggregate demand, the new AD<sub>2</sub> curve intersect AS at E<sub>2</sub>. Now the equilibrium level of output decrease to OM<sub>2</sub>.

## Saving-Investment Approach

The determination of the equilibrium level of income can also be shown in an alternative ways in the form of equality of saving and investment. It means that equilibrium level of national income is determined where investment equals to saving. At equilibrium, it is ex-ante or planned saving which is equal to ex-ante or planned investment. If ex-ante saving are more than ex-ante investment, aggregate demand is more than the aggregate supply and income level falls. Similarly if ex-ante savings are less than ex ante investment



aggregate demand is less than aggregate supply and income level will go up.



In fig, SS saving function curve intersect the II investment function curve at point E, hence the equilibrium level of income is OM. At OM level of income, planned saving and planned investment both are Equal to EM.

### EX-ANTE (OR PLANNED) V/S EX-POST (AN ACTUAL) TERMS

#### (A) Actual or realised or Ex-post

When we express the values of different terms like Consumption, saving, investment etc. in actual sense, it is called actual or realised & ex-post.

The amount of consumption which the consumer in an economy actually consume is called actual or realised or ex-post Consumption.

**Whatever is left out after deducting actual consumption expenditure from the income of an economy is called actual or realised or ex-post savings.**

**The actual addition in the capital stock of an economy is termed as actual or realised or ex-post investment.**

**The quantum of production which the producers actually produce in an economy is termed as actual or realised or ex-post output.**

### **Planned or Desired or Ex-ante**

**What the people had planned or desired are called ex-ante term.**

**What the consumer in an economy intend or planned or desired or ex-ante consumption.**

**What the saver in the economy intend or plan to save is called planned or desired or ex-ante savings.**

**What the investor in an economy intended or plan to invest is called planned or desired or ex-ante investor. What the producer in an economy intended or plan to produce is called planned or desired or ex-ante output.**