DETERMINATION OF INCOME AND EMPLOYMENT

Aggregate Demand refers to total value of all final goods and services that are planned to buy by all the sectors of the economy at a given level of income during a period of time. **AD** represents the total expenditure on goods and services in an economy during a period of time.

Components of Aggregate demand are:

(i) Household consumption expenditure (C).

(ii) Investment expenditure (I).

(iii) Govt. consumption expenditure (G).

(iv) Net export (X – M).

Thus, **AD = C + I + G + (X – M)**

In two sector economy AD = C + I

Aggregate Supply is the money value of all final goods and services available for purchase by an economy during a given period. It is the flow of goods and services in the economy. Since, money value of final goods and services is equal to net value added, **AS is nothing but the national income.**

AS = C + S

Aggregate supply represents the national income of the country.

AS = Y (National Income)

Average propensity to Consume (APC): It refers to the ratio between total consumption(C) and total income(Y) at given level of income in the economy.

Important Points about APC

(i) APC is more than 1: as long as consumption is more than national income before the break-even point, APC > 1.

(ii) APC = 1, at the break-even point, consumption is equal to national income.

(iii) APC is less than 1: beyond the break-even point. Consumption is less than national income.

(iv) APC falls with increase in income.

(v) APC can never be zero: because even at zero level of national income, there is autonomous consumption.

Consumption and autonomous consumption

Consumption

Consumption is a vital component of aggregate demand in the chapter determination of income and employment. The most important determinant of consumer demand is **household income.** Consumption changes as income changes and to study this relationship, we have a consumption function.

- **Consumption Function** refers to the relationship between consumption and income.
- **Autonomous Consumption** refers to when consumption takes place even when the income is zero.

Consumption Function is shown as C = C + cY

C is the consumption expenditure by households and it consists of two components autonomous consumption **C** and induced consumption **(cY)**.

According to the determination of income and employment, autonomous consumption is denoted by C and shows the consumption, which is independent of income. The induced component of consumption, cY refers to the dependence of consumption on income. When income rises by Re 1. Induced consumption rises by MPC, i.e. c or the marginal propensity to consume. This can be written as:

MPC = ΔC/ΔY = c

Determination of income and employment mentions that marginal propensity to consume value changes as income changes:

- ✓ When income changes, change in consumption can never exceed the difference in income.
- ✓ The maximum value which c can take is 1.
- ✓ The consumer may choose not to change consumption even when his/her income has changed. In this case MPC = 0.
- ✓ Generally, MPC lies between 0 and 1. If the consumer does not increase his/her consumption as his/her income increases then MPC = 0
- ✓ If the consumer increases his/her consumption with an increase in income, it is MPC = 1 or he/she uses a part of the change in income for changing consumption, it is 0< MPC<1.
- ✓ The Average Propensity to Consume (APC) refers to consumption per unit of income.
- ✓ Savings is another aspect of income. It is the income that is not consumed and is written as S = Y – C.
- ✓ MPS or Marginal Propensity to save is the rate of change in savings as the income increases. **MPS = ΔS/ΔY = s**
- ✓ The Average Propensity to Save (APS) refers to savings per unit of income.

Marginal Propensity to Consume (MPC):

- ✓ It is the change in income per unit change in consumption.
- ✓ It is represented by c and equals ΔCΔYΔCΔY, where △C△C is change in consumption and △Y△Y is the change in income.
- ✓ That is MPC= ΔCΔYΔCΔY
- ✓ Points to Remember about MPC
- ✓ **MPC=1:** If all the extra income is consumed, then △C=△Y△C=△Y, resulting in MPC= 1.
- ✓ **MPC = 0:** However, if the entire additional income is saved, △C△C=0 , and MPC= 0.
- ✓ **Constant MPC:** MPC is the slope of the consumption curve, and it remains constant in the short run.
- ✓ APC value > MPC.

Marginal Propensity to Save (MPS):

- It is the change in savings per unit of income change.
- It is represented by s and equals 1-c. This is because 1 is the whole, and if we less consumption from it, we can get the savings.
- It follows that, S + C = 1, i.e., the total of savings and consumption equals one.
- That is MPS= ΔSΔYΔSΔY
  Points to Remember About MPS
- MPS ranges from 0 to 1.
- MPS is the saving curve's slope.

- In the short run, MPS remains constant.

Relation between MPC and MPS

We know MPC + MPS = 1
Also
Y = C +S
Hence
$\Delta Y=\Delta C+\Delta S\Delta Y=\Delta C+\Delta S$ - (i)
Where,
$\Delta C=\Delta C$= Change in consumption
$\Delta Y=\Delta Y$= Change in income
$\Delta S=\Delta S$= Change in savings
And,
$MPC=\Delta C\Delta YMPC=\Delta C\Delta Y$
And,
$MPS=\Delta S\Delta YMPS=\Delta S\Delta Y$
So dividing eq (i) with change in Y on both sides
$\Delta Y\Delta Y=\Delta C\Delta Y+\Delta(Y-C)\Delta Y\Delta Y\Delta Y=\Delta C\Delta Y+\Delta(Y-C)\Delta Y$
$1=\Delta C\Delta Y+\Delta S\Delta Y1=\Delta C\Delta Y+\Delta S\Delta Y$
1 = MPC + MPS

Determination of Equilibrium Income in the Short Run

Equilibrium Level of Income

- The equilibrium level of income is only determined when AD = AS or S = I, i.e., when the flow of goods and services in the economy equals the demand for goods and services.
- However, it cannot always be at full employment and may be less than full employment.

Short Run Equilibrium Output:

The quantity of real GDP that will exist when AD intersects Short Run Aggregate Supply in a short-run macroeconomic equilibrium is the amount of aggregate output produced.

Assumptions:

- **Closed Economy:** In the framework of a two-sector model (households and firms), the determination of equilibrium output will be investigated. It implies that there is no government or international sector. Such that AD=C+I
- **Self contained Investment:** It is assumed that investment expenditure is self-contained, i.e., investments are unaffected by income levels.
- **Short-period analysis:** This analysis is with reference to short period only.

Determination of Income in Two-sector Model

J.M. Keynes in his famous book, 'General theory', has used two methods for the determination of national income at a particular time:

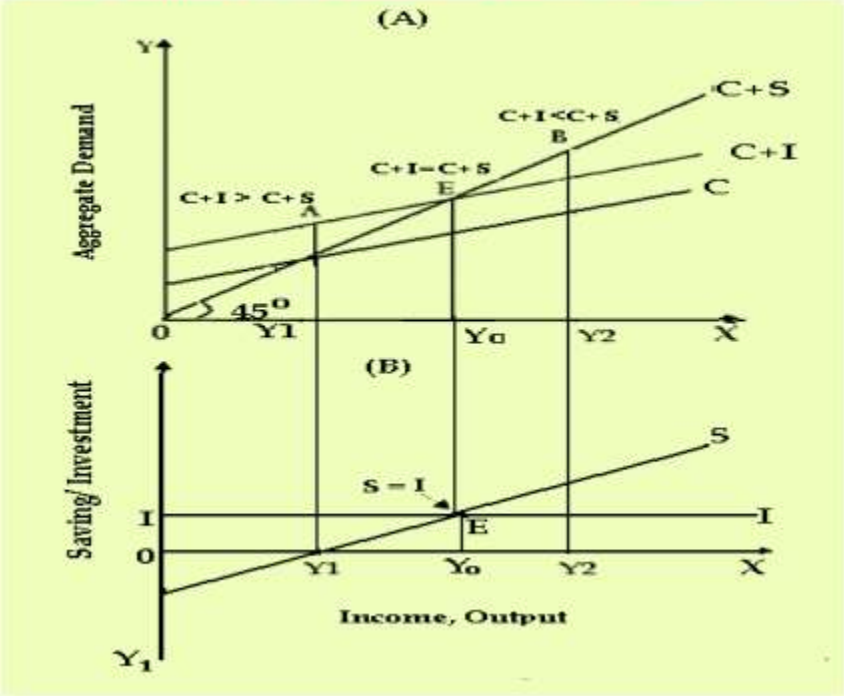
(1) Saving Investment Method.

(2) Aggregate Demand and Aggregate Supply Method. Both these approaches lead us to the determination of the same level of national income. It may here be mentioned that Keynes model of income determination is relevant in the context of short run only.

Assumptions: Keynes assumes that in the short run:

(i) The stock of capital, technique of production, forms of business organizations, do not change.
(ii) He also assumes a fair degree of competition in the market.
(iii) There is also absence of government role either as a taxer or as a spender.
(iv) Keynes further assumes that the economy under analysis is a closed one. There is no influence of exports and imports on the economy

Determination of Equilibrium Income: Two Sector Model



Investment

The chapter determination of income and employment mentions that investment is an essential component of the two-sector model. Investment is seen as an addition to the stock of physical capital and changes in the inventory of a producer.

Investment multiplier denotes the relation between the increases in investment, leading to an increase in national income.

- Full Employment Level of income refers to that level of income where all production factors are fully employed in the production process.
- If the equilibrium level of output is more than the full employment level, demand in the economy is more than the level of output produced at the maximum employment level.
- This situation is called the situation of excess demand.
- The equilibrium level of output may be more or less than the full employment level of output.

- If it is less than the full employment of output, it is because demand is not enough to employ all production factors. This situation is called the situation of **deficient demand.**

Aggregate Demand:- Aggregate demand is the total amount of final goods and services which all the sectors are planning to buy in an economy at a given level of income over a given period of time. For example consumer goods, services, and capital goods.

Components of Aggregate Demand

1. Private consumption Expenditure (C)
2. Investment Expenditure (I)
3. Government Expenditure (G)
4. Net Exports(X-M)

Aggregate Demand = C+I+G+(X-M)

1. **Private consumption expenditure (C) or household consumption expenditure**:- It refers to the expenditure on the final consumer's goods and services by the households to satisfy their wants.
2. **Investment expenditure (I):** It refers to the expenditure incurred on capital goods by private firms to increase their production capacity. These capital goods are in the form of machinery, building, land etc
3. **Government expenditure (G) :-** Refers to the expenditure incurred by the government on the purchase of goods and services to meet the needs of the people in the economy.
4. **Net Exports(X-M) :-** It refers to the difference between exports and imports (X-M)
   Where X stands for Exports and M stands for Imports.

Aggregate Demand in Two – Sector Model

In a two – sector model, it is assumed that aggregate demand is a function of Consumption and Investment also.

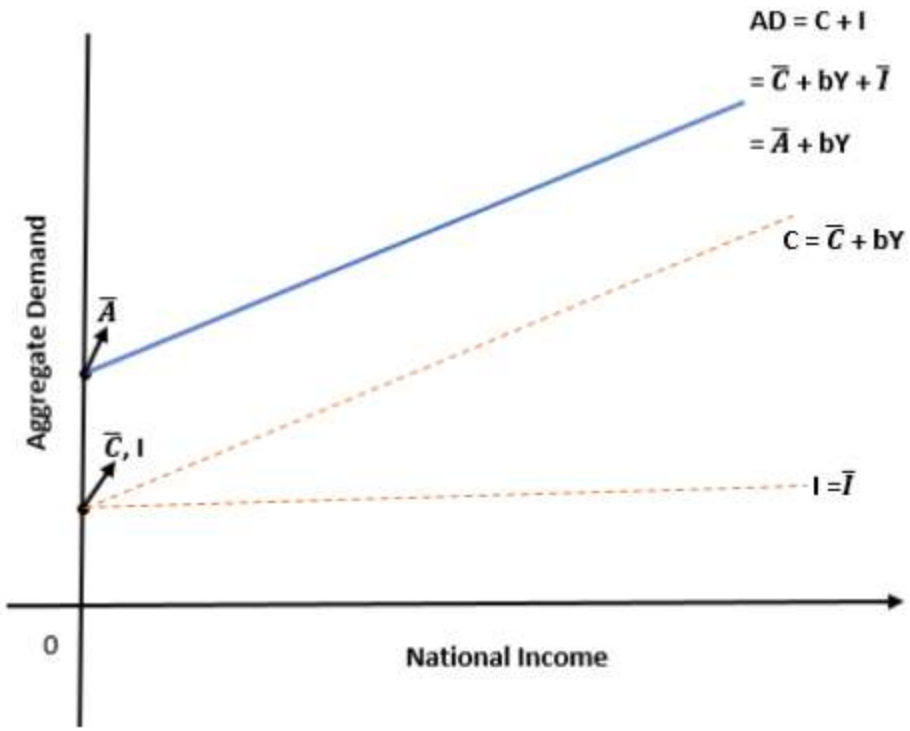
Aggregate demand in two – Sector Model =C+I

C= Consumption expenditure

I= Investment

Aggregate Demand Schedule and graph

National Income (Y)	Consumption (c)	Autonomous Investment(I)	AD= C+I
0	20	20	40
10	25	20	45
20	30	20	50
30	35	20	55
40	40	20	60
50	45	20	65



Important Concepts about Aggregate Demand

1. Aggregate Demand is a function of Consumption and investment6 only.
2. The investment expenditure is assumed to be autonomous which means it will remain constant at all the levels of income.
3. The investment curve will be a straight line, parallel to the axis as it is not affected by the change in income level.
4. Consumption will be positive even at zero level of income as the minimum level of consumption is done for survival
5. The slope of the consumption curve is positive which shows that when income increases consumption also increases.
6. The starting point of the AD curve is above zero as there is always a minimum level of consumption and investment in the economy.

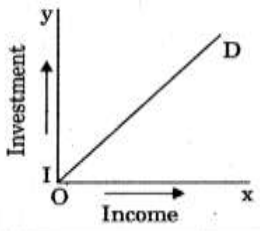
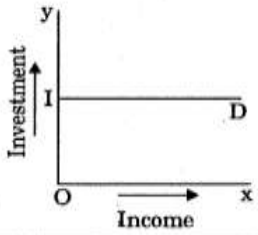
INVESTMENT FUNCTION: Definition: Investment refers to the expenditure incurred on the creation of New Capital Asset. For example, expenditure incurred on the purchase of machinery, building, equipment, etc.
It can be of two types:
(1) Induced investment
(2) Autonomous investment

Induced Investment
Definition: Induced investment is that investment, which is directly influenced by the level of income that is it, increases with income and it falls with a fall in income. These are made for profit Motive.
Autonomous Investment

Definition: Autonomous investment refers to investment, which is not influenced by the level of income. These are not made for-profit motive. The government on infrastructure activities generally makes these types of investments.

The level of autonomous investment depends upon social, economic and political conditions of any country hence its take it changes when there is a change in technology on the discovery of new resources or growth of population, etc.

Difference between Induced Investment & Autonomous Investment.

Induced Investment	Autonomous Investment
1. It depends upon income.	1. It has no concern with income. It is independent.
2. It is income elastic.	2. It is not income elastic.
3. It is generally done by private sector	3. It is generally made by government.
4. Induced investment curve moves upwards from left to the right.	4. Autonomous Investment curve remains parallel to x-axis.
5. 	

DETERMINANTS OF INVESTMENT

Investment in a new project depends upon two factors: Marginal efficiency of investment

Marginal Efficiency of Investment:

Definition: Marginal efficiency of investment refers to the expected rate of return from additional investment

Supply side of macroeconomic equilibrium

AD-AS APPROACH:

- The level of output where the Aggregate Demand equals Aggregate Supply (AD = AS) in an economy.
- It indicates that whatever the producers intended to manufacture during the year is exactly equal to what the buyers intended to purchase during the year.

Here,

AD = C + I (for a two-sector economy), and

AS = C + S

That is,

AD = Aggregate Demand,

AS = Aggregate Supply,

C = Consumption,

I = Investment,

S = Saving

The diagram represents aggregate demand, and the situation of equilibrium at point K, where AD=AS, and the level of equilibrium output at point Y.

Two different Situations:

- **AD > AS:** In this case aggregate demand exceeds aggregate supply, and a situation of unfulfilled demand persists. To curb this situation, the producers will enhance the level of output and production such that AS could increase and become equal to AD, and the situation of equilibrium is restored. This is shown as point R in the diagram, where AD>AS.
- **AD < AS:** In this case aggregate demand is less than the aggregate supply, and a situation of unwanted stocks persists. To curb this situation, the producers will decrease the level of output and production such that AS could decrease and become equal to AD, and the situation of equilibrium is restored. This is shown as point S in the diagram, where AD<AS.

Savings-Investment Approach:

It is the point of equilibrium, where S=I. Here, S = savings, or withdrawal, and I = investment, or injection.

Multiplier Mechanism:

- The multiplier shows us what the eventual change in income will be as a result of a change in investment. Changes in investment lead to changes in income.
- The aggregate demand rises when the autonomous measures (A) rise.
- As a result, output and income will rise in the next round, causing consumption and the AD to rise. This is referred to as the multiplier mechanism.
- It is represented symbolically by:

ΔI → ΔY → ΔC → ΔYΔI → ΔY → ΔC → ΔY

The operation of a multiplier can be illustrated using the table below, which is based on consumption, that is, ΔK=1000ΔK=1000 and MPC=45.MPC=45.

Working of multiplier:

The process of income generation is shown below.

Rounds	ΔIΔI	ΔYΔY	ΔCΔC
1	1000	1000	45 × 1000 = 80045 × 1000 = 800
2	-	800	45 × 800 = 64045 × 800 = 640
3	-	640	45 × 640 = 51245 × 640 = 512
4	-	512	45 × 512 = 409.645 × 512 = 409.6
	Total	5000	

According to the above table, as MPC = 45,MPC = 45, the initial increase in investment of Rs 1000 results in a total increase in income of Rs 5000. From the whole increase in income, Rs. 4000 will be spent and Rs. 5000 will be saved.

The derivation of the sum of total increase in income is shown below.

$=1000+45\times1000(45)2\times1000(45)3\times1000+\ldots\ldots\ldots\infty=1000+45\times1000(45)2\times1000(45)3\times1000+\ldots\ldots\ldots\infty$

$=1000[1+45+(45)2+(45)3+\ldots\ldots.\infty]=1000[1+45+(45)2+(45)3+\ldots\ldots.\infty]$

$=1000[11-45]=1000[11-45]$

$=1000\times51=1000\times51$

= Rs. 5000 crores.

How are both Income and Consumption parallel to each other?

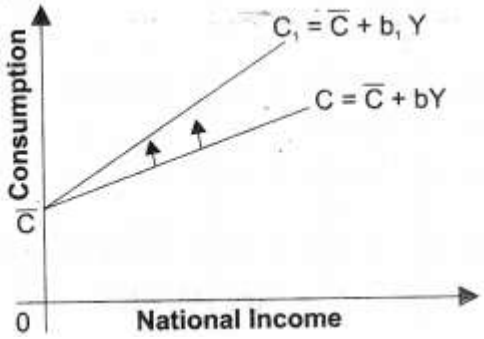
Let $C = \bar{C} + bY$ be the consumption function

Also Let $\bar{C} = 2$ and $\bar{C} = 2$ and $b = 0.5$

Thus, $C = 2 + 0.5Y$

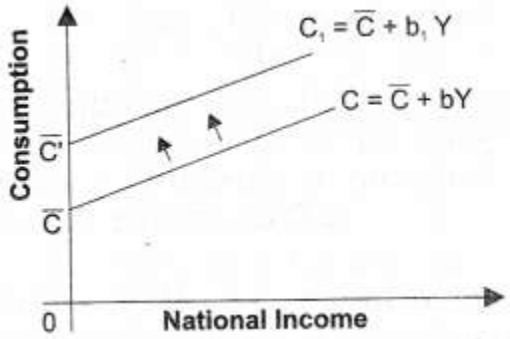
Consider two situations:

(*i*) When *b* (slope) increases: *b* is the slope of the consumption curve,



When b increases from 0.5 to 0.75, then consumption curve (which is a straight line) pivots upwards. This is called a parametric shift of a graph. It is shown in figure.

(ii)When C increases: It is the autonomous part of the consumption function. It graphically gives the intercept of the consumption curve. If increases from 2 to 5, there will be parallel upward shift in the consumption curves. It is shown in figure given.



Thus, when slope changes, there is parametric shift in the curve. When intercept changes, there is parallel shift in the curve.