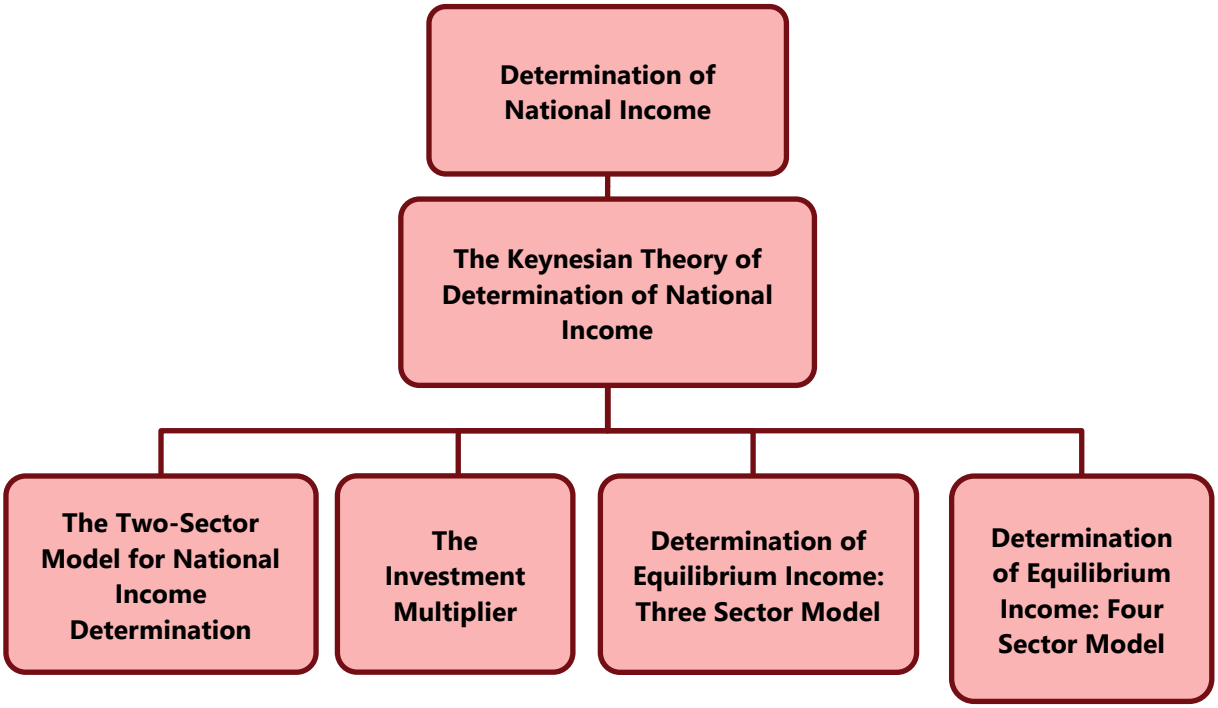
UNIT - 2: THE KEYNESIAN THEORY OF DETERMINATION OF NATIONAL INCOME

LEARNING OUTCOMES

After studying this Unit, you will be able to understand:

- Define Keynes' concept of equilibrium aggregate income
- Describe the components of aggregate expenditure in two, three and four sector economy models
- Explain national income determination in two, three and four sector economy models
- Illustrate the functioning of multiplier, and
- Outline the changes in equilibrium aggregate income on account of changes in its determinants.

UNIT OVERVIEW



2.1 INTRODUCTION

In the previous unit on National Income Accounting, we have discussed the importance of (GDP) to estimate the macro fundamentals of the country. In this unit, we shall focus on two issues namely, the factors that determine the level of national income and the determination of equilibrium aggregate income and output in an economy.

The Great Depression of the 1930's, was the greatest economic crisis the western world had experienced. The classical economist of the time had no well developed theory that would explain persistent unemployment nor any policy prescriptions to solve the problem. Many economists then recommended government spending as a way of reducing unemployment, but they had no macroeconomic theory by which to justify their recommendations. The history of modern macroeconomics was revolutionised in 1936, with the publication of John Maynard Keynes's General Theory of Employment, Interest, and Money.

The General Theory of Employment, Interest, and Money was more than a treatise for economists. It offered clear policy implications, and they were in tune with the times of the

Great Depression. Keynes introduced many of the building blocks of modern macroeconomics:

1. The relation of consumption to income, and the multiplier, which explains how shocks to aggregate demand can be amplified and lead to larger shifts in output.
2. Liquidity Preference (the term Keynes gave to the demand for money), which explains how monetary policy can affect interest rates and aggregate demand.
3. The importance of expectations in affecting consumption and investment; and the idea that shifts in expectations are a major factor behind shifts to demand and output.

The Keynesian theory of income determination is presented in three models:

(i) The two-sector model consisting of the household and the business sectors,

(ii) The three-sector model consisting of household, business and government sectors, and

(iii) The four-sector model consisting of household, business, government and foreign sectors

Before we attempt to explain the determination of income in each of the above models, it is pertinent that we understand the concept of circular flow in an economy which explains the functioning of an economy.

2.2 CIRCULAR FLOW IN A SIMPLE TWO-SECTOR MODEL

Concept of circular flow

The circular flow model demonstrates how money moves through society. Money flows from producers to workers as wages and flows back to producers as payment for products. In short, an economy is an endless circular flow of money. That is the basic form of the model, but actual money flows are more complicated. Economists have added in more factors to better depict complex modern economies. These factors are the components of a nation's GDP or national income. For that reason, the model is also referred to as the circular flow of income model.

The basic purpose of the circular flow model is to understand how money moves within an economy. It breaks the economy down into two primary players: households and corporations. It separates the markets that these participants operate in as markets for goods and services and the markets for the factors of production.

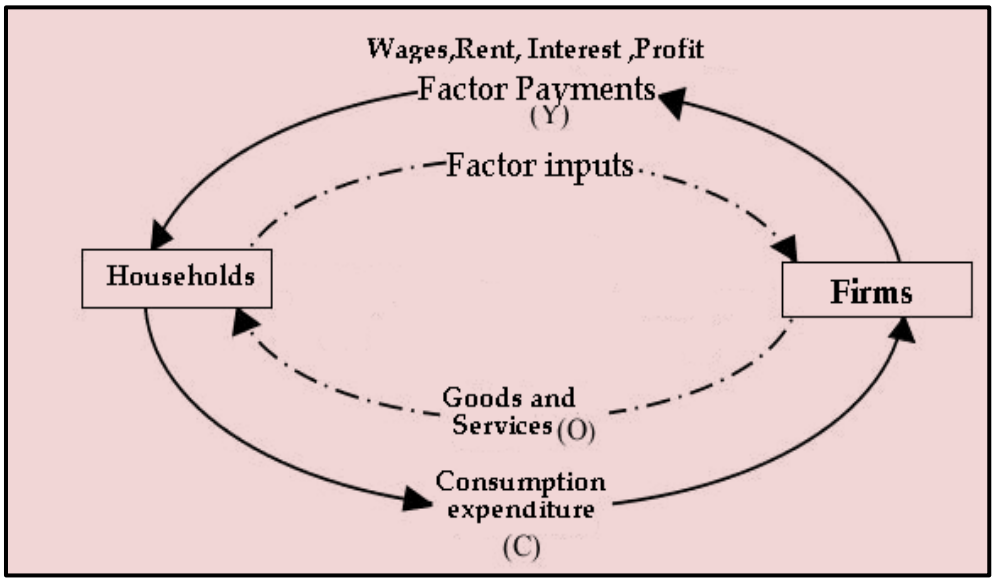
Households own all factors of production and they sell their factor services to earn factor incomes which are entirely spent to consume all final goods and services produced by business firms. The business firms are assumed to hire factors of production from the

households; they produce and sell goods and services to the households and they do not save. There are no corporations, corporate savings or retained earnings. The total income produced, *Y*, accrues to the households and equals their disposable personal income Y_d i.e., *Y* = Yd.

In the figure 1.2.1, the circular flow of income and expenditure which presents the working of the two- sector economy is illustrated in a simple manner.

Figure 1.2.1

Circular Flow in a Two Sector Economy



The circular broken lines with arrows show factor and product flows and present 'real flows' and the continuous line with arrows show 'money flows' which are generated by real flows. Real flows refer to the flow of the actual goods or services, while money flows refer to the payments for the services (wages, for example) or consumption payments.There are no injections into or leakages from the system. Since the whole of household income is spent on goods and services produced by firms, household expenditures equal the total receipts of firms which equal the value of output.

Factor Payments = Household Income = Household Expenditure = Total Receipts of Firms = Value of Output.

Before we go into the discussion on the equilibrium aggregate income and changes in it, we shall first try to understand the meaning of the term 'equilibrium' (defined as a state in which there is no tendency to change; or a position of rest). Output is at equilibrium level when the quantity of output produced is equal to the quantity demanded. Logically, an economy can

be said to be in equilibrium when the production plans of the firms and the expenditure plans of the households match.

Having understood the working of the two-sector model and the meaning of equilibrium output, we shall now have the formal presentation of the theory of income determination in a two-sector model which is the simplest representation of the key principles of Keynesian economics. In the theoretical model of the economy, the ex ante values of different variables should be our primary concern. Before we discuss the Keynesian theory of income determination, let us look at the basic concepts, definitions and functions used in his theory of income determination.

2.3 BASIC CONCEPTS AND FUNCTIONS

2.3.1 Aggregate Demand Function

Aggregate demand (AD) is what economists call total planned expenditure. In a simple two-sector economy, the ex ante aggregate demand (AD) for final goods or aggregate expenditure consists of only two components:

(i) Ex ante aggregate demand for consumer goods (C), and

(ii) Ex ante aggregate demand for investment goods (I)

$$AD = C + I \qquad (2.1)$$

Of the two components, consumption expenditure accounts for the highest proportion of the GDP. In a simple economy, the variable I is assumed to be determined exogenously and constant in the short run. Therefore, the short-run aggregate demand function can be written as:

$$AD = C + I \qquad (2.2)$$

Where $\bar{I}$ = constant investment.

From the equation (2.2), we can infer that, in the short run, AD depends largely on the aggregate consumption expenditure. We shall now go over to the discussion on consumption function.

2.3.2 The Consumption Function

Consumption function expresses the functional relationship between aggregate consumption expenditure and aggregate disposable income, expressed as:

$$C = f(Y) \qquad (2.3)$$

When income is low, consumption expenditures of households will exceed their disposable income and households dissave i.e. they either borrow money or draw from their past savings to purchase consumption goods. If the disposable income increases, consumers will increase their planned expenditures and current consumption expenditures rise, but only by less than the increase in income.

The specific form of consumption–income relationship termed the consumption function, proposed by Keynes is as follows:

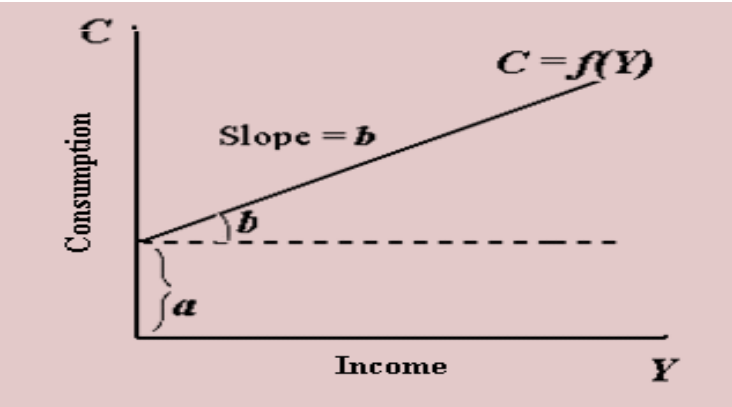
$$C = a + bY \qquad (2.4)$$

$$MPC = \frac{\Delta C}{\Delta Y} = b \qquad (2.5)$$

where C = aggregate consumption expenditure; *Y*= total disposable income; *a* is a constant term which denotes the (positive) value of consumption at zero level of disposable income; and the parameter *b*, the slope of the function, (ΔC /ΔY) is the marginal propensity to consume (MPC) i.e. the increase in consumption per unit increase in disposable income.

Figure 1.2.2

The Keynesian Consumption Function



The consumption function shows the level of consumption (C) corresponding to each level of disposable income (Y) and is expressed through a linear consumption function, as shown by the line marked C = f(Y) in figure 1.2.2.

The Keynesian assumption is that consumption increases with an increase in disposable income, but that the increase in consumption will be less than the increase in disposable

income (b <1). i.e. 0 < b < 1. This fundamental relationship between income and consumption plays a crucial role in the Keynesian theory of income determination.

2.3.3 Relationship Between Income and Consumption

Just as marginal propensity to consume, the average propensity to consume is a ratio of consumption defining income consumption relationship. The ratio of total consumption to total income is known as the average propensity to consume (APC).

$$\text{APC} = \frac{\textit{Total Consumption}}{\textit{Total Income}} = \frac{C}{Y} \quad (2.6)$$

The table below shows the relationship between income and consumption

Table 1.2.1

Relationship between Income and Consumption

Income (Y) (₹ Crores)	Consumption (C) (₹ Crores)	Saving (₹ Crores)	APC (C/Y)	MPC (ΔC /ΔY)
0	50	-50	∞	-
100	125	-25	125/100 = 1.25	75/100 = 0.75
200	200	0	200/200 = 1.00	75/100 = 0.75
300	275	25	275/300 = 0.92	75/100 = 0.75
400	350	50	350/400=0.88	75/100 = 0.75
500	425	75	425/500=0.85	75/100 = 0.75

Note: The conventional Keynesian MPC is assumed to have a constant value less than 1.00 and usually greater than 0.50:

APC is calculated at various income levels. It is obvious that the proportion of income spent on consumption decreases as income increases. What happens to the rest of the income that is not spent on consumption? If it is not spent, it must be saved because income is either spent or saved; there are no other uses to which it can be put. Thus, just as consumption, saving is a function of disposable income: S=f(Y).

2.3.5 The Relationship Between Income, Consumption and Saving

Saving is also a function of disposable income. The saving function shows the functional relationship between national income (= disposable income in two sector model) and saving.

$$S = f(Y)$$

This can be illustrated with the following table and diagram.

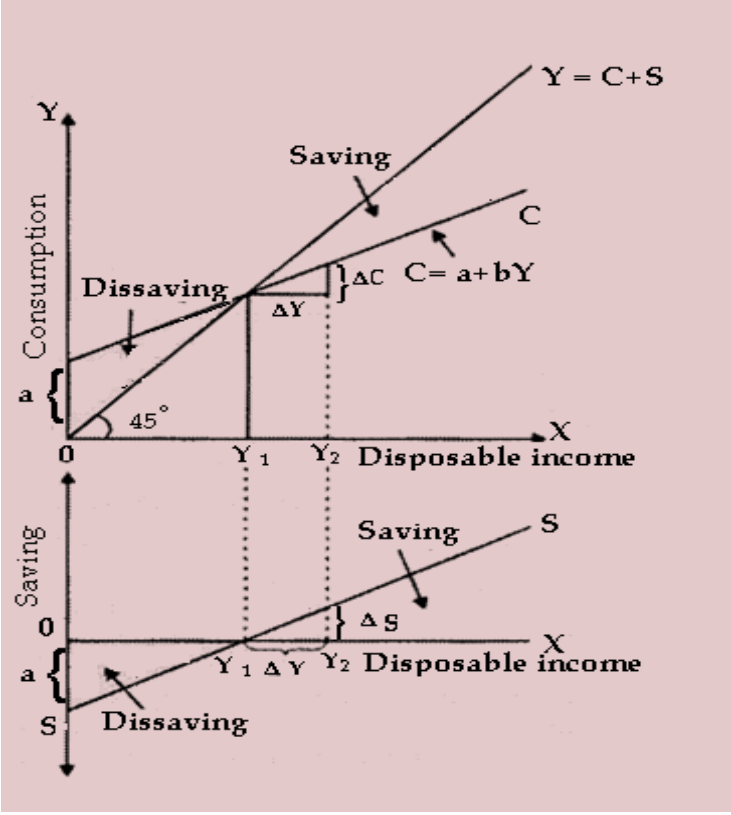
Table 1.2.2

Relationship between Income, Consumption and Saving

Disposable Income (Yd) (₹ Crores)	Consumption (C) (₹ Crores)	Saving (S) (₹ Crores)
0	20	-20
60	70	-10
120	120	0
180	170	10
240	220	20

Figure 1.2.3.

The Consumption and Saving Function



In figure 1.2.3, the consumption and saving functions are graphed. The saving function shows the level of saving (S) at each level of disposable income (Y). We know that consumption at zero level of income is positive (equal to a), and as such there should be dissaving also of the same magnitude. By definition, national income Y = C + S, Therefore, S = Y – C.

The slope of the saving function is the marginal propensity to save. If a one-unit increase in disposable income leads to an increase of 'b' units in consumption, the remainder (1 - b) is the increase in saving. The marginal propensity to save is the increase in saving per unit increase in disposable income.

(MPS) , s = 1-c

Saving is an increasing function of the level of income. In other words, saving increases as income rises.

$$MPS = \frac{\Delta S}{\Delta Y} = 1 - b \quad (2.7)$$

Marginal Propensity to Consume (MPC) is always less than unity, but greater than zero, i.e., 0 < b < 1 Also, MPC + MPS = 1; we have MPS 0 < b < 1. Thus, saving is an increasing function of the level of income because the marginal propensity to save (MPS) = 1- b is positive, i.e. saving increases as income increases.

Average Propensity to Save (APS)

The ratio of total saving to total income is called average propensity to save (APS). Alternatively, it is that part of total income which is saved.

$$APS = \frac{Total\ Saving}{Total\ Income} = \frac{S}{Y} \quad (2.8)$$

2.3.8 Aggregate Supply:

Ex ante or planned aggregate supply is the total supply of goods and services which firms in a national economy plan on selling during a specific time period. It is equal to the national income of the economy, which is either consumed or saved.

$$AS = C + S$$

Numerical Illustrations

ILLUSTRATION 1

What will be the value of average propensity to save when -

(i) C = 200 at Y = 1,000

(ii) S = 450 at Y = 1,200

SOLUTION

(i) $APS = \frac{S}{Y}$; S = Y – C = 1,000 – 200 = 800. Therefore, $APS = \frac{S}{Y} = \frac{800}{1000} = 0.8$

(ii) When S = 450 and Y = 1,200; $APS = \frac{S}{Y}$ = 450/1200= = 0.375

2.4 THE TWO-SECTOR MODEL OF NATIONAL INCOME DETERMINATION

In this section, we shall describe the two-sector model of determination of equilibrium levels of output and income in its formal form using the aggregate demand function and the aggregate supply function. The equilibrium level of income and output in the Keynesian framework is that level at which aggregate demand (C+ I) and aggregate supply (C + S) or output are equal. In other words, Investment is equal to Savings.

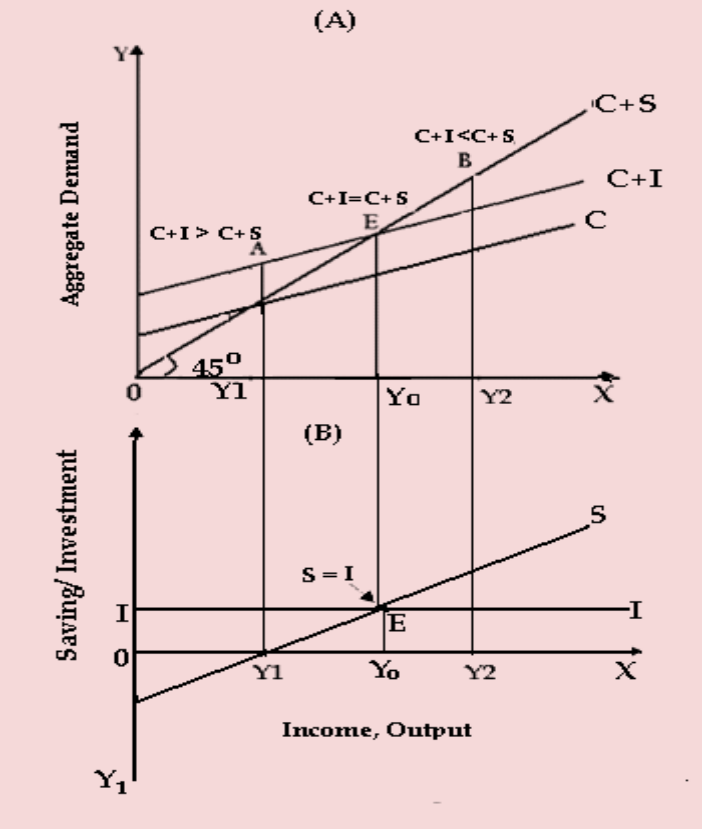
$$C + I = C + S$$

or

$$I = S \qquad (2.9)$$

Figure 1.2.4

Determination of Equilibrium Income: Two Sector Model



In figure 1.2.4, the aggregate demand curve is linear and positively sloped indicating that as the level of national income rises, the aggregate demand (or aggregate spending) in the

economy also rises. The aggregate expenditure line is flatter than the 45-degree line because, as income rises, consumption also increases, but by less than the increase in income. The 45-degree line illustrates every single point at which planned aggregate expenditure, measured on the Y, or vertical axis, is equal to planned aggregate production, which is measured on the X, or horizontal axis. In other words, all points on the 45° line indicate that aggregate expenditure equal aggregate output; i.e. (C+I) is equal to Y or (C+S). Therefore, the line maps out all possible equilibrium income levels.

For all points below the 45-degree line, planned aggregate expenditure is lesser than GDP and for all points above the 45-degree line; planned aggregate expenditure is greater than GDP. we would like equilibrium to occur at potential GDP i.e. at the level of full employment. Only at point E and at the corresponding equilibrium levels of income and output Y_O does aggregate demand exactly equals output. At that level of output and income, planned spending precisely matches production.

You may bear in mind the basic point that according to Keynes, aggregate demand will not always be equal to aggregate supply. Aggregate demand depends on the households' plan to consume and to save. Aggregate supply depends on the producers' plan to produce goods and services. In other words, **aggregate supply** represents **aggregate value expected by business firms** and **aggregate demand represents their realised value**. For the aggregate demand and the aggregate supply to be equal so that equilibrium is established, the households' plan must coincide with producers' plan. At equilibrium, expected value equals realised value. However, Keynes held the view that that there is no reason to believe that:

(i) consumers' consumption plan always coincides with producers' production plan, and

(ii) that producers' plan to invest matches always with households' plan to save.

Putting it differently, there is no reason for C + I and C + *S* to always be equal.

The investment function (*I*) is shown in panel B of the figure, equilibrium, planned investment equals savings Above the equilibrium of income Y_0, saving (the distance between the 45 degree line and the consumption schedule) exceeds planned investment, while below equilibrium level of income Y_0 , planned investment exceeds saving.

The equality between saving and investment can be seen directly from national income accounting . Since income is either spent or saved, Y = C+S. Without government and foreign trade, aggregate demand equals consumption plus investment, Y=C+I. Putting the two together, we have C+S = C+I, or S=I.

If the leakages are greater than the injections, then national income will fall, while if injections are greater than leakages, national income will rise. The national income will be in equilibrium only when intended saving is equal to intended investment. If there is any deviation from

equilibrium, i.e. planned saving is not equal to planned investment, the process of readjustment will bring the economy back to equilibrium.

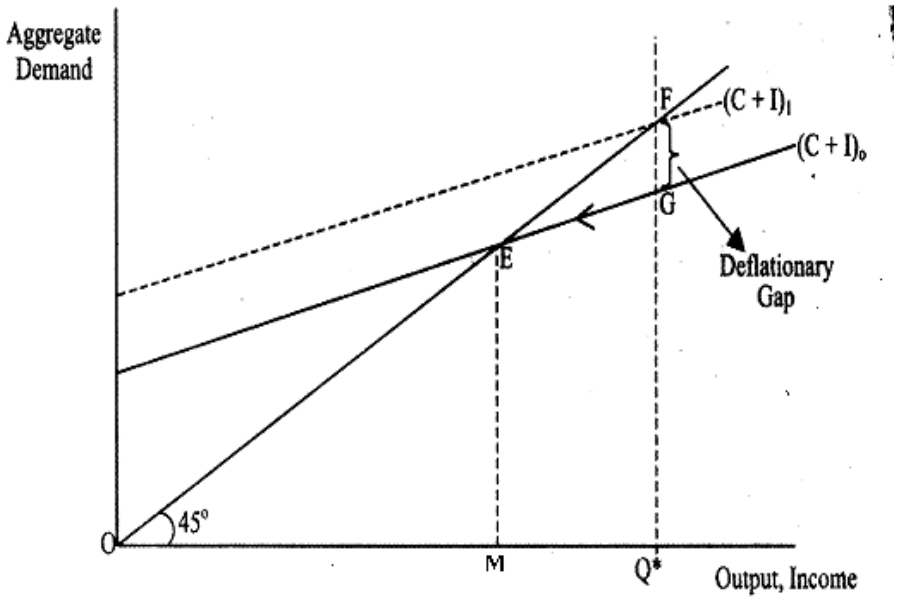
2.4.1 Equilibrium with Unemployment or Inflation

An important point to remember is that Keynesian equilibrium with equality of planned aggregate expenditures and output need not take place at full employment. If the aggregate expenditure line intersects the 45-degree line at the level of potential GDP, then there is full employment equilibrium. There is no recession, and unemployment is at the natural rate. But there is no guarantee that the equilibrium will occur at the potential GDP level of output. The economy can settle at any equilibrium which might be higher or lower than the full employment equilibrium.

(i) Deflationary Gap

If the aggregate demand is for an amount of output less than the full employment level of output, then we say there is deficient demand. Deficient demand gives rise to a 'deflationary gap' or 'recessionary gap'. Recessionary gap also known as 'contractionary gap' arises in the Keynesian model of the macro economy when the equilibrium level of aggregate production achieved in the short-run falls short of what could be produced at full employment. Recessionary gap occurs when the economy is in a business-cycle contraction or recession.

Figure 1.2.5
Deficient Demand - Deflationary Gap



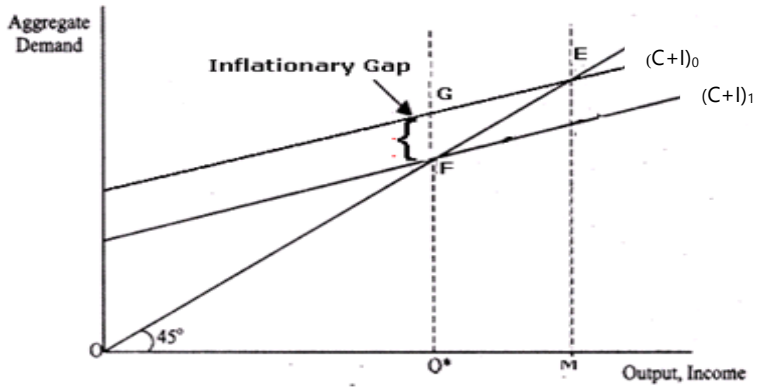
(C+I)

In figure 1.2.5, OQ* is the full employment level of output. For the economy to be at full employment equilibrium, aggregate demand should be Q*F. If the aggregate demand is Q*G, it represents a situation of deficient demand. The resulting deflationary gap is FG. Firms will experience unplanned build-up of inventories of unsold goods and they will respond by cutting production and employment leading to decrease in output and income until the under-employment equilibrium is reached at E.

(ii) Inflationary Gap

If the aggregate demand is for an amount of output greater than the full employment level of output, then we say there is excess demand. Excess demand gives rise to 'inflationary gap' which is the amount by which actual aggregate demand exceeds the level of aggregate demand required to establish the full employment equilibrium. This is the sort of gap that tends to occur during a business-cycle expansion and sets in motion forces that will cause demand pull inflation.

Figure 1.2.6
Excess Demand - Inflationary Gap



In figure 1.2.6, the economy will be at full employment equilibrium at F with OQ* full employment level of output and income. Suppose the aggregate demand is for Q*G, there is excess demand and the resulting inflationary gap FG. The real output will be constant, but the rise in the price level will cause an increase in the nominal output until the new equilibrium is reached at point E. Point E is an equilibrium point because the aggregate demand ME is equal to output OM. At the new equilibrium, real output, real income and employment will be the same; nominal output and income has increased due to inflation.

In the Keynesian model, neither wages nor interest rates will decline in the face of abnormally high unemployment and excess capacity. Therefore, output will remain at less than the full employment rate as long as there is insufficient spending in the economy. Keynes argued that this was precisely what was happening during the Great Depression.

Numerical Illustrations

ILLUSTRATION 2

Calculate marginal propensity to consume and marginal propensity to save from the following data about an economy which is in equilibrium:

National income = 2500, Autonomous consumption expenditure = 300, Investment expenditure = 100

SOLUTION

Y = C + I

By putting the value we get, 2500 = C + 100

C = 2500 -100 = 2400

$C = \bar{C} + bY$

2400 = 300 + 2500 b

2400-300= 2500b

b = 0.84; MPS= 1- MPC = 1- 0.84 = 0.16

ILLUSTRATION 3

An economy is in equilibrium. Calculate national income from the following-

Autonomous consumption = 100; Marginal propensity to save= 0.2; Investment expenditure= 200

SOLUTION

Y= C + I

$Y = \bar{C}$ + MPC (Y) + I where MPC = 1-MPS

Y = 100 + 0.8Y + 200= 300 + 0.8Y

Y- 0.8Y = 300

0.2Y=300,

Y= 1500

ILLUSTRATION 4

Suppose the consumption of an economy is given by C = 20+ 0.6 Y and investment I= 10+ 0.2 Y. What will be the equilibrium level of National Income?

SOLUTION

Y= C + I= 20+ 0.6 Y + 10+ 0.2 Y

Y = 30+ 0.8 Y

Y- 0.8 Y = 30

Y= 150

ILLUSTRATION 5

Suppose the consumption function C= 7+ 0.5Y, Investment is ₹ 100, Find out equilibrium level of Income, consumption and saving?

SOLUTION

Equilibrium Condition–

Y= C +I, Given C= 7+0.5Y and I= 100

Therefore Y= 7+0.5Y+ 100

Y- 0.5Y= 107

$Y= \frac{107}{0.5} = 214$

Y= C+I

214= C+100

C=114

S= Y- C =100

ILLUSTRATION 6

If the consumption function is C= 250 + 0.80 Y and I = 300. Find out equilibrium level of Y, C and S?

SOLUTION

$Y= \frac{1}{1-b}(a+ \bar{I})$or Y = C+ I

$Y= \frac{1}{1-.80}(250+300) = 2750$

$C = a + \frac{b}{1-b}(a+ \bar{I})$or C= 250 + 0.80 Y

C = 250+0.8(2750) C = 2450

S = Y-C where C = a+ bY

S = Y- (a + bY)

S= -a + (1- b) Y

= - 250 + (1 – 0.80)2750= 300

Or directly,

S=Y- C

S=2750 – 2450= 300.

ILLUSTRATION 7

If saving function S = -10 + 0.2Y and autonomous investment I = 50 Crores. Find out the equilibrium level of income, consumption and if investment increases permanently by ₹5 Crores, what will be the new level of income and consumption?

SOLUTION

S= I

-10 + 0.2Y = 50

0.2Y = 50+ 10

Y = 300 Crores

C= Y- S

Where S= -10 + 0.2 (300) = 50

C= 300-50 = 250 Crores

With the increase in investment by ₹ 5 Crores, the new investment will become equal to ₹ 55 Crores.

S = I

-10 + 0.2Y = 55

Y= 325 Crores

C= 270 Crores

ILLUSTRATION 8

Given the empirical consumption function C= 100+0.75Y and I = 1000, calculate equilibrium level of national income. What would be the consumption expenditure at equilibrium level national income?

SOLUTION

C= 100+0.75Y and I = 1000,

Y=C+I in equilibrium

Y= 100+0.75 Y + 1000 $=> Y = \frac{I}{1-0.75}$ (100+1000)

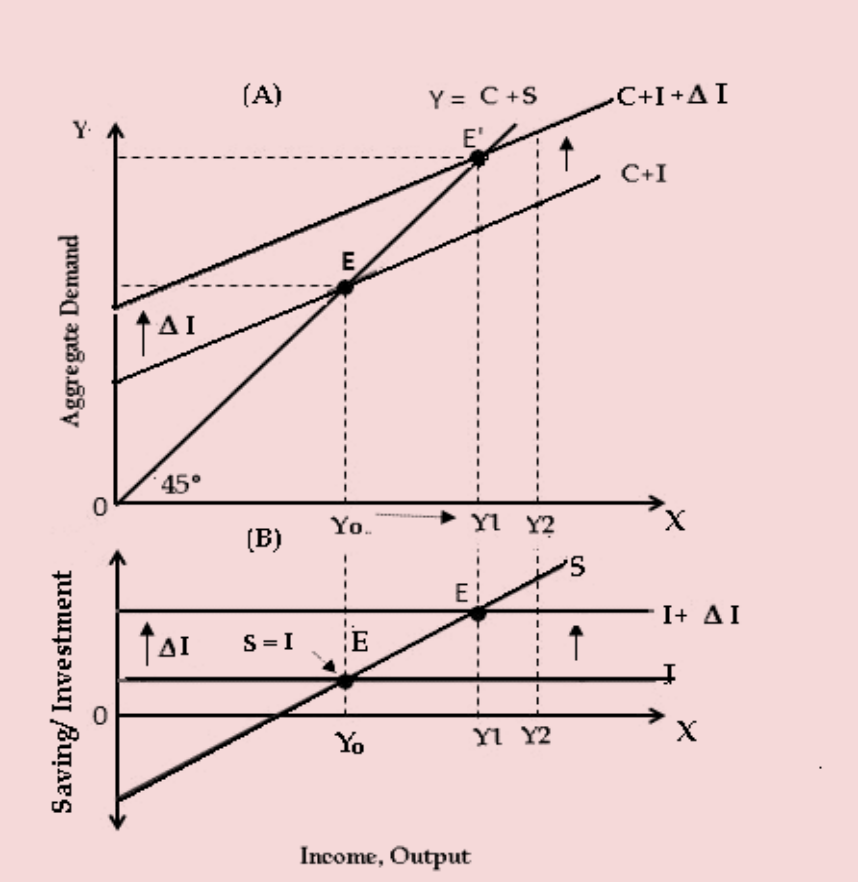
Y= $\frac{I}{1-0.75}$ (1100) = 1/0.25 (1100) = 4400.

Y=C + I; C= 4400 – 1000 = 3400

2.5 THE INVESTMENT MULTIPLIER

In this section we develop an answer to the following question: By how much does a one unit increase in autonomous spending raise the equilibrium level of income? There appears to be a simple answer. Since, in equilibrium , income equals aggregate demand , it would seem that a unit increase in autonomous demand or spending should raise equilibrium income by one unit . That is not correct. In Fact the effect of an increase in investment (upward shift in the investment schedule) causes an upward shift in the aggregate demand function. It is due to a process of multiple increases in equilibrium income due to increase in investment and how much increase occurs depends upon the marginal propensity to consume. The process of increase in national income due to increase in investment depicts the investment multiplier impact illustrated below.

Figure 1.2.7
Effect of Changes in Autonomous Investment



In the figure 1.2.7, an increase in autonomous investment by Δ*I* shifts the aggregate demand schedule from C+I to C+I+ΔI. Correspondingly, the equilibrium shifts from E to $E^1$and the equilibrium income increases more than proportionately from Yo to Y_1. Why and how does this happen? This occurs due to the operation of the investment multiplier.

Multiplier refers to the phenomenon whereby increase in investment expenditure will lead to a proportionately larger change (or multiple changes) 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. When the level of investment increases by an amount, say ΔI, the equilibrium level of income will increase by some multiple amounts, Δ Y. The ratio of ΔY to ΔI is called the investment multiplier, k.

$$k = \frac{\Delta Y}{\Delta I} \qquad (2.11)$$

The size of the multiplier effect is given by Δ Y = k ΔI.

For example, if a change in investment of ₹ 2000 million causes a change in national income of ₹ 6000 million, then the multiplier is 6000/2000 =3. Thus multiplier indicates the change in equilibrium national income for each rupee change in the desired autonomous investment. Since the increase in national income (ΔY) is the result of increase in investment (ΔI), the multiplier is called 'investment multiplier.'

The process behind the multiplier can be compared to the 'ripple effect' of water. Let us assume that the initial disturbance comes from a change in autonomous investment (ΔI) of 500 units. The economy being in equilibrium, an upward shift in aggregate demand leads to an increase in national income which in a two sector economy will be, by definition, distributed as factor incomes. There will be an equal increase in disposable income. Firms experience increased demand and as a response, their output increases. The process further continues as an autonomous rise in investment leads to induced increases in consumer demand as income increases.

We find at the end that the increase in equilibrium income per rupee increase in investment is:

$$\frac{\Delta Y}{\Delta I} = \frac{1}{1-MPC} = \frac{1}{MPS} \qquad (2.12)$$

From the above, we find that the marginal propensity to consume (MPC) is the determinant of the value of the multiplier and that there exists a direct relationship between MPC and the value of multiplier. Higher the MPC more will be the value of the multiplier, and vice-versa. On the contrary, higher the MPS, lower will be the value of multiplier and vice-versa. The maximum value of multiplier is infinity when the value of MPC is 1 i.e. the economy decides

to consume the whole of its additional income. We conclude that the value of the multiplier is the reciprocal of MPS.

For example, if the value of MPC is 0.75, then the value of the multiplier as per (2.11) is:

$$\frac{1}{1-MPC} = \frac{1}{0.25} = 4$$

The multiplier concept is central to Keynes's theory because it explains how shifts in investment caused by changes in business expectations set off a process that causes not only investment but also consumption to vary. The multiplier shows how shocks to one sector are transmitted throughout the economy.

Increase in income due to increase in initial investment, does not go on endlessly. The process of income propagation slows down and ultimately comes to a halt. Causes responsible for the decline in income are called leakages. Income that is not spent on currently produced consumption goods and services may be regarded as having leaked out of the income stream. If the increased income goes out of the cycle of consumption expenditure, there is a leakage from the income stream which reduces the effect of multiplier. The more powerful these leakages are, the smaller the value of the multiplier. The leakages are caused due to:

1. progressive rates of taxation which result in no appreciable increase in consumption despite increase in income
2. high liquidity preference and idle saving or holding of cash balances and an equivalent fall in marginal propensity to consume
3. increased demand for consumer goods being met out of the existing stocks or through imports
4. additional income spent on purchasing existing wealth or purchase of government securities and shares from shareholders or bondholders
5. undistributed profits of corporations
6. part of increment in income used for payment of debts
7. case of full employment additional investment will only lead to inflation, and
8. scarcity of goods and services despite having high MPC

The MPC, on which the multiplier effect of increase in income depends, is high in underdeveloped countries; but ironically the value of multiplier is low. Due to structural inadequacies, increase in consumption expenditure is not generally accompanied by increase in production. E.g. increased demand for industrial goods consequent on increased income does not lead to increase in their real output; rather prices tend to rise.

An important element of Keynesian models is that they relate to short-period equilibrium and contain no dynamic elements. There is nothing like Keynesian macro-economic dynamics. When a shock occurs, for example when there is a change in autonomous investment due to change in some variable, one equilibrium position can be compared with another as a matter of comparative statics. There is no link between one period and the next and no provision is made for an analysis of processes through time.

Numerical Illustrations

ILLUSTRATION 9

In an economy investment expenditure is increased by ₹400 Crores and marginal propensity to consume is 0.8. Calculate the total increase in income and saving.

SOLUTION

MPC = 0.8; ΔI = 400 Crores

Multiplier (K)= 1 /1- MPC = 1 /1- 0.8 =1/ 0.2= 5

MPS= 1 - MPC = 1 – 0.8 = 0.2

Increase in income (ΔY) = K ×ΔI = 5 × 400=2,000 Crores

Increase in saving= ΔY × MPS = 2,000 × 0.2 = 400 Crores

ILLUSTRATION 10

An increase in investment by 400 Crores leads to increase in national income by 1,600 Crores. Calculate marginal propensity to consume.

SOLUTION

Increase in investment (ΔI) = 400 Crores

Increase in national income (Δ Y) = 1,600 Crores

Multiplier (K) =ΔY/ΔI = K= 1,600/ 400 = 4

We know, K= 1 /1 –MPC

4= 1 /1 -MPC

⇨ MPC= 0.75

ILLUSTRATION 11

In an economy, investment is increased by Rs 600 Crores. If the marginal propensity to consume is 0.6, calculate the total increase in income and consumption expenditure.

SOLUTION

MPC = 0.6; ΔI = ₹ 600 Crores

Multiplier (K) = 1/ 1- MPC = 1/ 1 – 0.6 = 1/ 0.4 =25.

Increase in income (ΔY) = K × ΔI = 2.5 × Rs 600 Crores= ₹ 1,500 Crores

Increase in consumption (ΔC) =ΔY × MPC = Rs1, 500Crores × 0.6 = ₹ 900 Crores.

ILLUSTRATION 12

Suppose in a country investment increases by ₹ 100 Crores and consumption is given by C = 10 + 0.6Y (where C = consumption and Y = income). How much increases will there take place in income?

SOLUTION

Multiplier = k = $\frac{1}{1-MPC}$ k = $\frac{1}{1-0.6}$ = 2.5

Substituting the value of k and ΔI value in ΔY= kΔI

ΔY= 2.5 × 100= ₹ 250Crores

Thus, increase in investment by Rs 100 Crores will cause equilibrium income to rise by ₹ 250 Crores.

2.6 DETERMINATION OF EQUILIBRIUM INCOME: THREE SECTOR MODEL

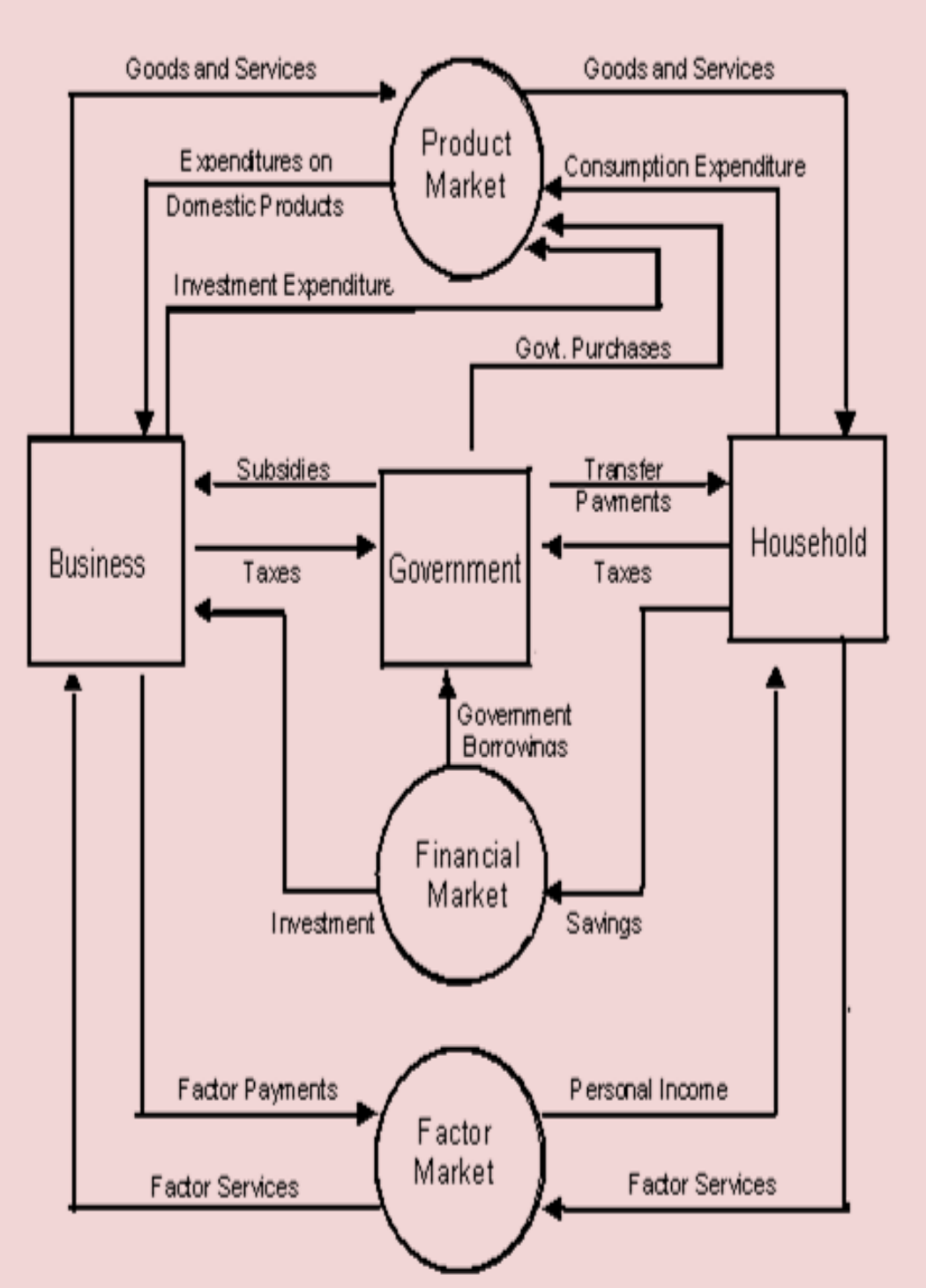
Aggregate demand in the three sector model of closed economy (neglecting foreign trade) consists of three components namely, household consumption(C), desired business investment demand(I) and the government sector's demand for goods and services(G). Thus in equilibrium, we have

$$Y = C+I+G \qquad (2.13)$$

Since there is no foreign sector, GDP and national income are equal. As prices are assumed to be fixed, all variables are real variables and all changes are in real terms. To help interpret these conditions, we turn to the flowchart below. Each of the variables in the model is a flow variable.

Figure 1.2.8

Circular Flow in a Three Sector Economy



The three-sector, three-market circular flow model which accounts for government intervention highlights the role played by the government sector. From the above flow chart, we can find that the government sector adds the following key flows to the model:

i) Taxes on households and business sector to fund government purchases

ii) Transfer payments to household sector and subsidy payments to the business sector

iii) Government purchases goods and services from business sector and factors of production from household sector, and

iv) Government borrowing in financial markets to finance the deficits occurring when taxes fall short of government purchases

However, unlike in the two sector model, the whole of national income does not return directly to the firms as demand for output. There are two flows out of the household sector in addition to consumption expenditure namely, saving flow and the flow of tax payments to the government. These are actually leakages. The saving leakage flows into financial markets, which means that the part that is saved is held in the form of some financial asset (currency, bank deposits, bonds, equities, etc.). The tax flow goes to the government sector.

The leakages which occur in the household sector do not necessarily mean that the total demand must fall short of output. There are additional demands for output on the part of the business sector itself for investment and from the government sector. In terms of the circular flow, these are injections. The investment injection is shown as a flow from financial markets to the business sector. The purchasers of the investment goods, typically financed by borrowing, are actually the firms in the business sector themselves. Thus, the amount of investment in terms of money represents an equivalent flow of funds lent to the business sector.

The three-sector Keynesian model is commonly constructed assuming that government purchases are autonomous. This is not a realistic assumption, but it will simplify our analysis. Determination of income can also be explained with the help of aggregate demand and aggregate supply (figure 1.2.9)

$$AD = C + I + G$$

$$AS = C + S + T$$

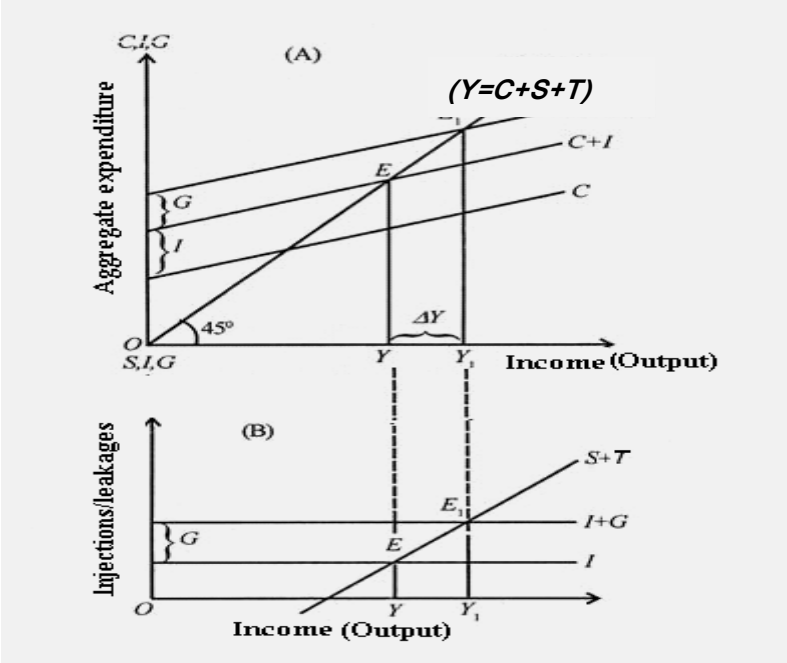
The equilibrium national income is determined at a point where both aggregate demand and aggregate supply are equal, that is,

$$AD = Y = AS$$

$$C + I + G = Y = C + S + T$$

Figure 1.2.9

Determination of Equilibrium Income: Three Sector Model



The variables measured on the vertical axis are C, I and G. The autonomous expenditure components namely, investment and government spending do not directly depend on income and are exogenous variables determined by factors outside the model. You may observe that in panel B of the figure 1.2.9, the lines that plot these autonomous expenditure components are horizontal as their level does not depend on Y. Therefore, C + I + G schedule lies above the consumption function by a constant amount.

The line S + T in the graph plots the value of savings plus taxes. This schedule slopes upwards because saving varies positively with income. Just as government spending, level of tax receipts (T) is decided by policy makers.

The equilibrium level of income is shown at the point E_1 where the (C + I + G) schedule crosses the 45° line, and aggregate demand is therefore equal to income (Y). In equilibrium, it is also true that the (S + T) schedule intersects the (I + G) horizontal schedule.

We shall now see why other points on the graph are not points of equilibrium. Consider a level of income below Y. We find that it generates consumption as shown along the consumption function. When this level of consumption is added to the autonomous expenditures (I + G), aggregate demand exceeds income; the (C + I + G) schedule is above the 45° line. Equivalently at this point I + G is greater than S + T, as can be seen in panel B of the figure 1.2.9. With demand outstripping production, desired investments will exceed actual investment and there will be an unintended inventory shortfall and therefore a tendency for

output to rise. Conversely, at levels of income above Y_1, output will exceed demand; people are not willing to buy all that is produced. Excess inventories will accumulate, leading businesses to reduce their future production. Employment will subsequently decline and output will fall back to the equilibrium level. It is only at Y that output is equal to aggregate demand; there is no unintended inventory shortfall or accumulation and, consequently, no tendency for output to change. An important thing to note is that the change in total spending, followed by changes in output and employment, is what will restore equilibrium in the Keynesian model, not changes in prices.

2.6.1 The Government Sector and Income Determination

We have seen above that the government influences the level of income through taxes, transfer payments, government purchases and government borrowing. A comprehensive discussion on the effect of government fiscal policy is beyond the scope of this unit; and therefore, we shall look into a few variables.

(i) Income Determination with Lump Sum Tax

We assume that the government imposes a lump sum tax, i.e. taxes that do not depend on income, has a balanced budget (G=T) and also that there are no transfer payments. The consumption function is defined as –

$C = a + b\ Y_d$

Where $Y_d = Y - T$ (disposable income), T = lump sum tax

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

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

Numerical Illustrations

ILLUSTRATION 13

Suppose we have the following data about a simple economy:

$C = 10 + 0.75Y_d$, $I = 50$, $G = T = 20$where C is consumption, I is investment, Y_d is disposable income, G is government expenditure and T is tax.

(a) Find out the equilibrium level of national income.

(b) What is the size of the multiplier?

SOLUTION

(a) Since G = T, budget of the government is balanced

Substituting the values of C, I and G in Y we have

Y=C+I+G

$Y = a + bY_d + I + G$

Y= 10 + 0.75 (Y – 20) + 50 + 20

Y= 10 + 0.75 Y- 15 + 50 + 20

or, Y – 0.75 Y = 65

or, Y (1 – 0.75) = 65

or, 0.25 Y = 65

or, Y = 65 /.25 = 260

The equilibrium value of Y = 260

(b) The value of the multiplier is = 1/ (1 – MPC) = 1/ (1 – b) = 1/ (1 – 0.75) = 1/0.25 = 4

(ii) Income Determination with Lump Sum Tax and Transfer payments

The consumption function is defined as –

$C = a + b Y_d$

Where Y_d= Y- T+ TR where T is a lump sum tax and TR is autonomous transfer payments

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

Y= C+ I+ G

Y= a+ b (Y - T + TR) + I + G

Y= a +bY – bT +bTR + I + G

Y – bY= a – bT +bTR + I + G

Y(1-b)= a – bT +bTR + I + G

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

ILLUSTRATION 14

Suppose the structural model of an economy is given –

C = 100+ 0.75 Yd; I = 200, G = T = 100; TR= 50, find the equilibrium level of income?

SOLUTION

Y= C+ I+ G

Y = 100+ 0.75 Yd + 200 + 100

Y= 100 + 0.75(Y– 100 + 50) + 200 + 100

Y = 100 + 0.75Y -75 + 37.5 +200 +100

Y = 1450

Or use Y = $\frac{1}{1-b}(a - bT + bTR + I + G)$ to calculate income.

(iii) Income Determination with tax as a function of Income

In (i) and (ii) above, we have analysed the effect of balanced budget with an autonomous lump sum tax. In reality, the tax system consists of both lump sum tax and proportional taxes. The tax function is defined as;

Tax function T = $\bar{T}$ + t Y

Where $\bar{T}$ = autonomous constant tax

t = income tax rate

T = total tax

The consumption function is

$C = a + b Y_d$

Where Y_d = Y- T or Y -$\bar{T}$ - t Y

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

Therefore, the equilibrium level of national income can be measured as-

Y= C + I+ G

Y=a+bYd+I+G

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

Y = a +bY - b$\bar{T}$ - b t Y + I + G

Y- bY + btY = a -b$\bar{T}$ + I +G

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

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

Where $\frac{1}{1-b(1-t)}$ (represent the tax multiplier)

ILLUSTRATION 15

For a closed economy, the following data is given –

Consumption C = 75 + 0.5 (Y-T); Investment I = 80; Total tax T = 25 + 0.1Y; Government expenditure G = 100.

(a) Find out equilibrium income?

(b) What is the value of multiplier?

SOLUTION

a) $Y = C + I + G$

$Y = 75 + 0.5(Y - 25 - 0.1Y) + 80 + 100$

$Y(1-0.5+0.05) = 75-12.5+80+100$

$Y = \frac{1}{1-0.5+0.05}(242.5)$

$Y = 440.91$

b) Multiplier $= \frac{1}{1-b(1-t)} = 1/[1-0.5(1-0.1)] = 1.82$

(iv) Income Determination with Tax (as a Function of Income), Government Expenditure and Transfer Payments

Here consumption function is written as $C = a + b(Y - \bar{T} - tY + TR)$

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

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

ILLUSTRATION 16

Suppose C= 100 + 0.80 (Y- T + TR); I = 200; T= 25+0.1Y; TR= 50; G = 100

Find out equilibrium level of Income?

SOLUTION

$Y = C + I + G$

$Y = 100 + 0.80 (Y - T + TR) + I + G$

$Y = 100 + 0.80(Y - 25 - 0.1Y + 50) + 200 + 100$

$Y - 0.80 Y + 0.08 Y = 420$

$Y(1-0.8+0.08) = 420$

$Y = 1500$

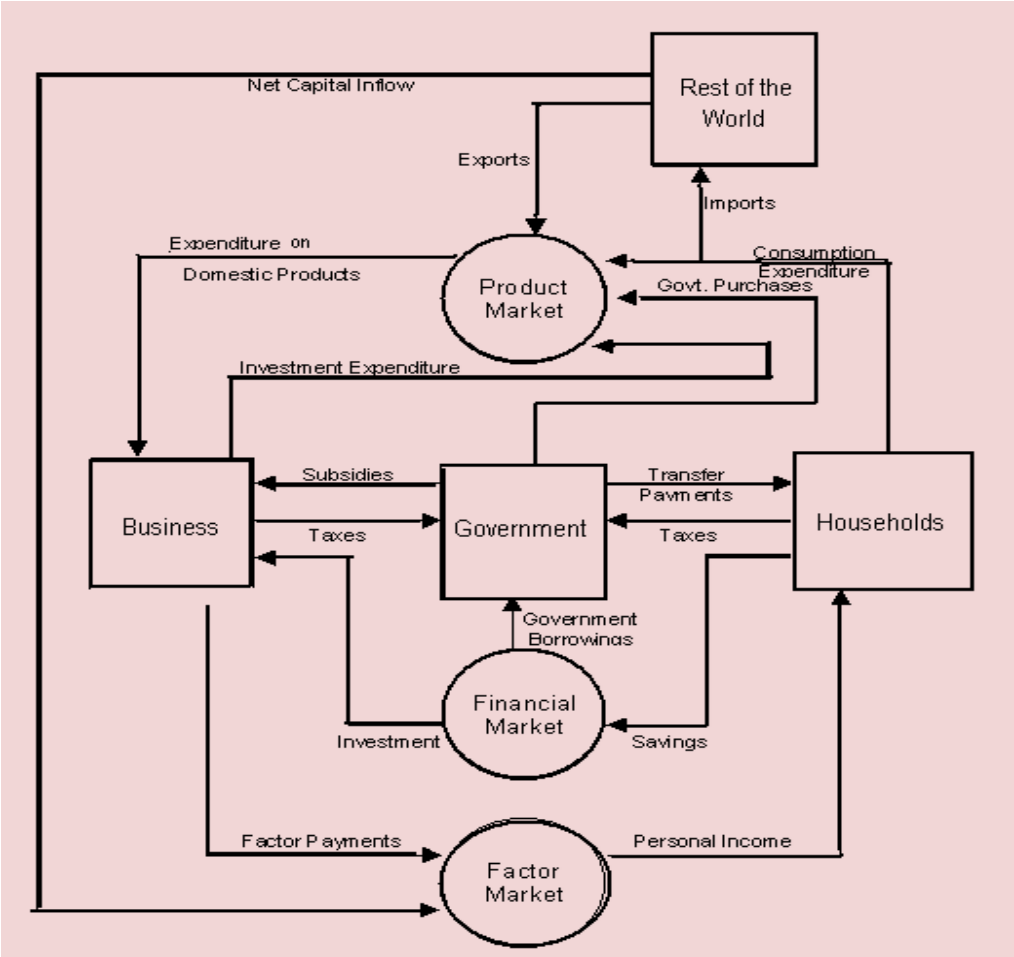
2.7 DETERMINATION OF EQUILIBRIUM INCOME: FOUR SECTOR MODEL

The four sector model includes all four macroeconomic sectors, the household sector, the business sector, the government sector, and the foreign sector. The foreign sector includes households, businesses, and governments that reside in other countries. The following flowchart shows the circular flow in a four sector economy.

In the four sector model, there are three additional flows namely: exports, imports and net capital inflow which is the difference between capital outflow and capital inflow. The C+I+G+(X-M) line indicates the aggregate demand or the total planned expenditures of consumers, investors, governments and foreigners (net exports) at each income level.

Figure 1.2.10

Circular Flow in a Four Sector Economy



In equilibrium, we have

$$Y = C + I + G + (X-M) \qquad (2.14)$$

The domestic economy trades goods with the foreign sector through exports and imports. Exports are the injections in the national income, while imports act as leakages or outflows of national income. Exports represent foreign demand for domestic output and therefore, are part of aggregate demand. Since imports are not demands for domestic goods, we must subtract them from aggregate demand. The demand for imports has an autonomous component and is assumed to depend on income. Imports depend upon marginal propensity to import which is the increase in import demand per unit increase in GDP. The demand for exports depends on foreign income and is therefore exogenously determined and autonomous. Imports are subtracted from exports to derive net exports, which is the foreign sector's contribution to aggregate expenditures. Since import has an autonomous component ($\bar{M}$) and is assumed to depend on income(Y) and marginal propensity to import (m), the import function is expressed as $M = \bar{M} + mY$. Marginal propensity to import $m = \Delta M/\Delta Y$ is assumed to be constant.

As noted above, the equilibrium level of national income is determined at the level at which the aggregate demand is equal to aggregate supply. As the aggregate demand in the four sector model is given in equation 2.14, the equilibrium condition is expressed as follows -

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

$$\text{Where } C = a + b(Y-T)$$

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

The equilibrium level of National Income can now be expressed by –

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

$$Y = a + b\,(Y - T) + I + G + X - \bar{M} - mY$$

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

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

The economy being in equilibrium, suppose export of country increases by ΔX autonomously, all other factors remaining constant. By incorporating the increase in exports by ΔX, the equilibrium equation of the country can be expressed as

$$Y + \Delta Y = \frac{1}{1-b+m}\,(a - b\,T + I + G + X - \bar{M} + \Delta X) \text{ or}$$

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

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

We get, $Y + \Delta Y = Y + \frac{1}{1-b+m}\Delta X$

Subtracting Y from both sides, we get $\Delta Y = \frac{1}{1-b+m}\Delta X$

By rearranging $\Delta Y = \frac{1}{1-b+m}\Delta X$, we get

$$\frac{\Delta Y}{\Delta X} = \frac{1}{1-b+m}$$

Or alternatively written as

$$\frac{\Delta Y}{\Delta X} = \frac{1}{1-(b-m)}$$

The term $\frac{1}{1-b+m}$ is known as foreign trade multiplier whose value is determined by marginal propensity to consume (b) and marginal propensity to import (m).

If in the model proportional income tax and government transfer payments are incorporated, then only the denominator of multiplier will change. If income tax is of form $T = \bar{T} + t\,Y$ where $\bar{T}$ is constant lump-sum, t is the proportion of income tax and TR > 0 and autonomous, then the four sector model can be expressed as: –

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

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

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

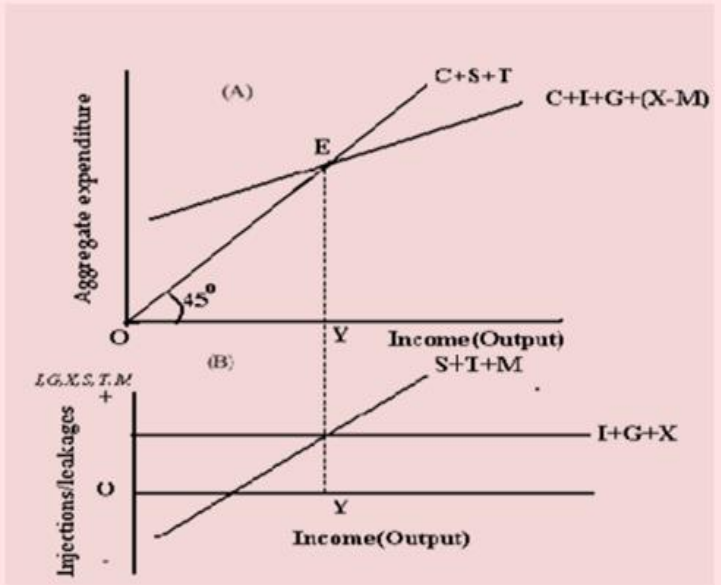
The equilibrium level of National Income can now be expressed as:

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

With the help of figure 1.2.11, we shall explain income determination in the four sector model.

Figure 1.2.11

Determination of Equilibrium Income: Four Sector Model

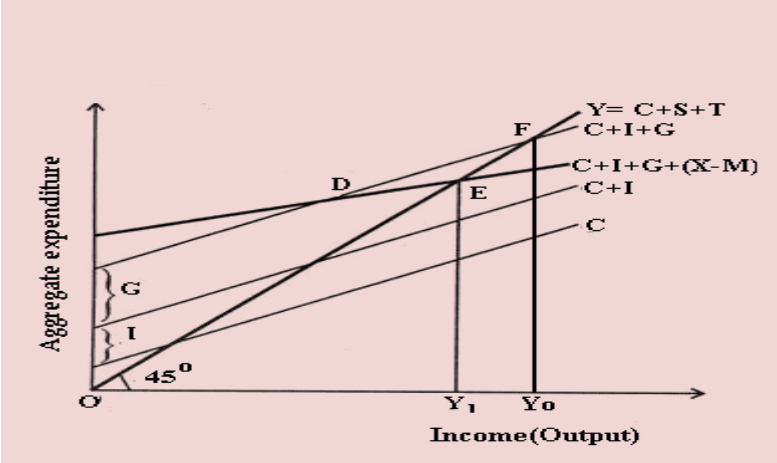


Equilibrium is identified as the intersection between the C + I + G + (X - M) line and the 45-degree line. The equilibrium income is Y. From panel B, we find that the leakages(S+T+M) are equal to injections (I+G+X) only at equilibrium level of income.

We have seen above that only net exports(X-M) are incorporated into the four sector model of income determination. We know that injections increase the level of income and leakages decrease it. Therefore, if net exports are positive (X > M), there is net injection and national income increases. Conversely, if X<M, there is net withdrawal and national income decreases.

Figure 1.2.12

Effects on Income When Imports are Greater than Exports



We have seen in section 2.5 above that equilibrium income is expressed as a product of two terms: $\Delta Y = k \Delta I$; i.e. the level of autonomous investment expenditure and the investment multiplier. The autonomous expenditure multiplier in a four sector model includes the effects of foreign transactions and is stated as $\frac{1}{(1-b+m)}$ where 'm' is the propensity to import which is greater than zero. You may recall that the multiplier in a closed economy is $\frac{1}{(1-b)}$

The greater the value of 'm', the lower will be the autonomous expenditure multiplier. The more open an economy is to foreign trade, (the higher mis) the smaller will be the response of income to aggregate demand shocks, such as changes in government spending or autonomous changes in investment demand. The higher the value of 'm',the larger the proportion of this induced effect on demand for foreign, not domestic, consumer goods. The increase in imports per unit of income constitutes an additional leakage from the circular flow of (domestic) income at each round of the multiplier process and reduces the value of the autonomous expenditure multiplier.

An increase in demand for exports of a country is an increase in aggregate demand for domestically produced output and will increase equilibrium income just as an increase in government spending or an autonomous increase in investment. In summary, an increase in the demand for a country's exports has an expansionary effect on equilibrium income, whereas an autonomous increase in imports has a contractionary effect on equilibrium income. However, this should not be interpreted to mean that exports are good and imports are harmful in their economic effects. Countries import goods that can be more efficiently produced abroad, and trade increases the overall efficiency of the worldwide allocation of resources. This forms the rationale for attempts to stimulate the domestic economy by promoting exports and restricting imports.

Numerical Illustration

ILLUSTRATION 17

The consumption function is C = 40 + 0.8Y_d,T= 0.1Y, I = 60 Crores G = 40 Crores, X = 58 and M = 0.05 Y. Find out equilibrium level of income, Net Export, net export if export were to increase by 6.25.

SOLUTION

$C= 40+ 0.8Y_d$

$C= 40 + 0.8 (Y- 0.1Y)$

$Y= C + I+ G + (X – M)Y= 40+0.8(Y-0.1Y)+60+40+(58-0.05Y)$

$Y= 40+0.8(0.9Y)+60+40+58-0.05Y$

$Y-0.72Y+0.05Y =198$

Y(1-0.72+0.05) =198

Y(0.33) =198

Y= 198/0.33 = 600 Crores

Net Export= X-M = 58 – 0.05Y

58 – 0.05 (600) =58- 30= 28

If exports increase by 6.25, then exports = 64.25

Then, Y = 40+ 0.8 (Y- 0.1Y) + 60 + 40 + (64.25- 0.05Y)

Y(1-0.72+0.05) = 204.5

Y(0.33) = 204.5

Y=204.5/0.33 = 619.697

Then import = .05 × 619.697= 30.98

Net Export= 64.25- 30.98= 33.27 Crores

Thus, there is surplus in balance of trade as Net Exports are positive.

ILLUSTRATION 18

An economy is characterised by the following equation-

Consumption	$C = 60+0.9Y_d$
Investment	I = 10
Government expenditure	G = 10
Tax	T = 0
Exports	X = 20
Imports	M = 10 +0.05 Y

What is the equilibrium income?

Calculate trade balance and foreign trade multiplier.

SOLUTION

Y = C + I+ G + (X – M)

= 60+0.9(Y – 0) + 10 +10 + (20- 10 -0.05Y)

= 60+ 0.9 Y +30 -0.05 Y

Y= 600

Trade Balance = X – M = 20-10-0.05(600)=- 20

Thus, trade balance in deficit.

Foreign trade multiplier= $\frac{1}{1-b+m}=\frac{1}{\&1-0.9+0.05}$ = 6.66

2.8 CONCLUSION

According to the Keynesian theory of income and employment, national income depends upon the aggregate effective demand. If the aggregate effective demand falls short of that output at which all those who are both able and willing to work are employed, it will result in unemployment in the economy. Consequently, there will be a gap between the economy's actual and optimum potential output. On the contrary, if the aggregate effective demand exceeds the economy's full employment output (production capacity), it will result in inflation. Nominal output will increase, but it simply reflects higher prices, rather than additional real output. It is not necessary that the equilibrium aggregate output will also be the full employment aggregate output. It is undesirable and a cause of great concern for the society and government if a large number of people remain unemployed. In the absence of government policies to stabilise the economy, incomes will be unstable because of the instability of investment. By making appropriate changes in government spending (G) and taxes, the government can counteract the effects of shifts in investment. Appropriate changes in fiscal policy by adjusting government expenditure and taxes could keep the autonomous expenditure constant even in the face of undesirable changes in the investment.

SUMMARY

- John Maynard Keynes in his masterpiece 'The General Theory of Employment Interest and Money' published in 1936 put forth a comprehensive theory to explain the determination of equilibrium aggregate income and output in an economy.
- The equilibrium analysis is best understood with a hypothetical simpletwo-sector economy which has only households and firms with all prices (including factor prices), supply of capital and technology constant; the total income produced *Y*, accrues to the households and equals their disposable personal income.
- The equilibrium output occurs when the desired amount of output demanded by all the agents in the economy exactly equals the amount produced in a given time period.
- In the two-sector economy aggregate demand (AD) or aggregate expenditure consists of only two components: aggregate demand for consumer goods and aggregate

demand for investment goods, *I* being determined exogenously and constant in the short run.

- Consumption function expresses the functional relationship between aggregate consumption expenditure and aggregate disposable income, expressed as C = f (Y).The specific form consumption function, proposed by Keynes C = a + bY
- The value of the increment to consumer expenditure per unit of increment to income *(b)* is termed the Marginal Propensity to Consume (MPC).
- The Keynesian assumption is that consumption increases with an increase in disposable income ($b > 0$), but that the increase in consumption will be less than the increase in disposable income ($b < 1$).
- The propensity to consume refers to the proportion of the total and the marginal incomes which people spend on consumer goods and services.
- The proportion or fraction of the total income consumed is called 'average propensity to consume' *(APC)*= Total Consumption /Total Income
- Since $Y = C + S$, consumption and saving functions are counterparts of each other. The condition for national income equilibrium can thus be expressed as C + I = C + S
- Changes in income are primarily from changes in the autonomous components of aggregate demand, especially from changes in the unstable investment component.
- The investment multiplier k is defined as the ratio of change in national income (ΔY) due to change in investment (ΔI)
- The marginal propensity to consume (MPC) is the determinant of the value of the multiplier. The higher the marginal propensity to consume (MPC) the greater is the value of the multiplier.
- The more powerful the leakages are, the smaller will be the value of multiplier.
- Aggregate demand in the three sector model of closed economy (neglecting foreign trade) consists of three components namely, household consumption(C), desired business investment demand(I) and the government sector's demand for goods and services(G).
- The government sector imposes taxes on households and business sector,effects transfer payments to household sector and subsidy payments to the business sector, purchases goods and services and borrow from financial markets.
- In equilibrium, it is also true that the (S + T) schedule intersects the (I + G) horizontal schedule.

- Taxes act as leakage from the economic system. Thus, tax multiplier when, $T=\bar{T}-tY$, is $\frac{1}{1-b(1-t)} < \frac{1}{(1-b)}$
- The four sector model includes all four macroeconomic sectors, the household sector, the business sector, the government sector, and the foreign sector and in equilibrium, we have Y = C + I + G + (X-M)
- The domestic economy trades goods with the foreign sector through exports and imports.
- Imports are subtracted from exports to derive net exports, which is the foreign sector's contribution to aggregate expenditures. If net exports are positive (X > M), there is net injection and national income increases. Conversely, if X<M, there is net withdrawal and national income decreases.
- The autonomous expenditure multiplier in a four sector model includes the effects of foreign transactions and is stated as $\frac{1}{(1-b+m)}$ against $\frac{1}{(1-b)}$ in a closed economy.
- The greater the value of *m*, the lower will be the autonomous expenditure multiplier.
- An increase in the demand for exports of a country is an increase in aggregate demand for domestically produced output and will increase equilibrium income just as would an increase in government spending or an autonomous increase in investment.

TEST YOUR KNOWLEDGE

Multiple Choice Questions

1. *In the Keynesian model, equilibrium aggregate output is determined by*
   - *(a) aggregate demand*
   - *(b) consumption function*
   - *(c) the national demand for labor*
   - *(d) the price level*
2. *Keynes believed that an economy may attain equilibrium level of output*
   - *(a) only at the full-employment level of output*
   - *(b) below the full-employment level of output*
   - *(c) only if prices were inflexible*
   - *(d) a) and c) above*

3. *According to Keynes, consumption expenditure is determined by*

   (a) *the level of interest rates*

   (b) *extent of government taxes and subsidies*

   (c) *disposable income*

   (d) *autonomous investment expenditure*

4. *The marginal propensity to consume (MPC) can be defined as*

   (a) *a change in spending due to a change in income*

   (b) *a change in income that is saved after consumption*

   (c) *part of income that is spent on consumption.*

   (d) *part of income that is not saved.*

5. *If the consumption function is expressed as C = a + bY then b represents*

   (a) *autonomous consumer expenditure when income is zero*

   (b) *the marginal propensity to consume.*

   (c) *the expenditure multiplier when consumption is increased*

   (d) *part of disposable income*

6. *If the consumption function is expressed as C = a + bY then a represents*

   (a) *autonomous consumer expenditure.*

   (b) *the marginal propensity to consume.*

   (c) *the consumption income relationship*

   (d) *Non- linear consumption function*

7. *If the consumption function is C = 20 + 0.5Yd, then an increase in disposable income by ₹ 100 will result in an increase in consumer expenditure by ₹----------*

   (a) *25*

   (b) *70*

   (c) *50*

   (d) *100*

8. *If the autonomous consumption equals ₹ 2,000 and the marginal propensity to consume equals 0.8. If disposable income equals ₹ 10,000, then total consumption will be ₹ _____*

   (a) *8,000*

(b) 6,000

(c) 10,000

(d) None of the above

9. In the Keynesian cross diagram, the point at which the aggregate demand function crosses the 45-degree line indicates the

(a) level of full employment income.

(b) less than full employment level of income.

(c) equilibrium level of income which may or may not be full employment level of income

(d) autonomous level of income which may not be full employment level of income

10. In a closed economy, aggregate demand is the sum of

(a) consumer expenditure, demand for exports and government spending.

(b) consumer expenditure, planned investment spending and government spending.

(c) consumer expenditure, actual investment spending, government spending and net exports.

(d) consumer expenditure, planned investment spending, government spending, and net exports.

11. Under equation C= a+by, b=0.8, what is the value of 2 sector expenditure multiplier?

(a) 4

(b) 2

(c) 5

(d) 1

ANSWERS

1.	**(a)**	2.	**(b)**	3.	**(c)**	4.	**(a)**	5.	**(b)**	6.	**(a)**
7.	**(c)**	8.	**(c)**	9.	**(c)**	10.	**(b)**	11.	**(c)**		