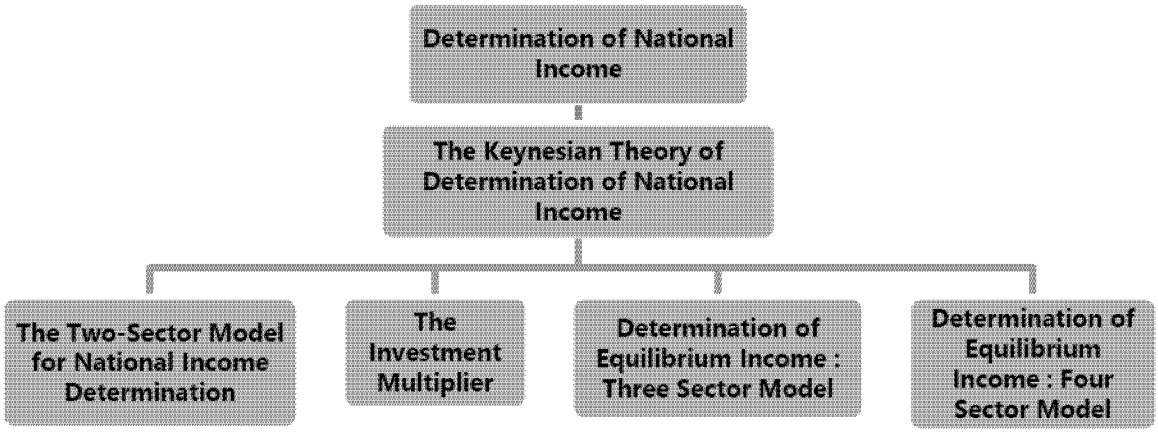
5. THE KEYNESIAN THEORY OF DETERMINATION OF NATIONAL INCOME



Q.No.1. State the three models of income determination presented by J.M. Keynes. (A) (SM)

The British Economist John Maynard Keynes in his masterpiece **'The General Theory of Employment Interest and Money'** published in 1936 put forth a comprehensive theory on the determination of equilibrium aggregate income and output in an economy.

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.

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

Q.No.2. Explain circular flow in a simple two-sector model as stated by J.M. Keynes. (B) (SM)

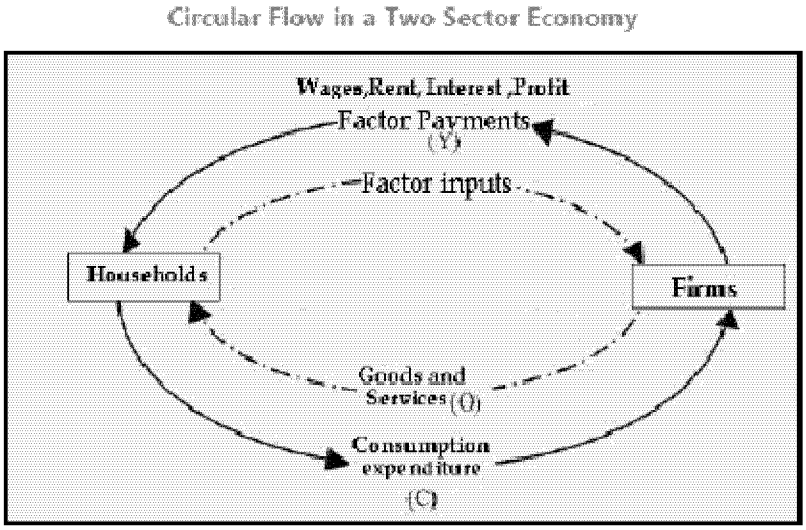
The theory of income determination in a two-sector model is the simplest representation of the key principles of Keynesian economics.

Two-sector model by J. M. Keynes:

Though two sector economy model is hypothetical and does not exist in reality; it provides a simple and convenient basis for understanding the Keynesian theory of income determination.

1. **Assumptions:**
   - **a)** There are only two sectors in the economy Households (with only consumption) and Firms (investment outlays).
   - **b)** Households spent their entire factor incomes to consume all final goods and services
   - **c)** The firms hire factors of production from the households; they produce and sell final goods and services to the households and they do not save.
   - **d)** The total income produced, Y, accrues to the households and equals to their disposable personal income (Y_d) i.e., $Y = Y_d$.
   - **e)** All prices (including factor prices), supply of capital and technology remain constant.
   - **f)** There are no corporations, corporate savings or retained earnings.
   - **g)** The government sector does not exist and hence there are no taxes, government expenditure or transfer payments.
   - **h)** The economy is a closed economy, (i.e., foreign trade does not exist).
   - **i)** All investment outlay is autonomous (not determined either by the level of income or the rate of interest).
   - **j)** All investment is net (i.e. National Income equals the Net National Product).

2. Circular Flow of Income and Expenditure of the Two - Sector Economy:



a) **Households:** 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. ($Y = Y_d$.)

b) **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.

c) The circular broken lines with arrows show factor and product flows and present 'real flows'

d) The continuous line with arrows shows 'money flows' which are generated by real flows.

e) These two circular flows-real flows and money flows-are in opposite directions

f) The value of real flows equal the money flows because the factor payments are equal to household incomes.

g) There are no injections into or leakages from the system.

h) Since the whole of household income is spent on goods and services produced by firms, household expenditures equal to the total receipts of firms which is equal to the value of output.

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

3. Equilibrium under two sector model:

a) Equilibrium output occur when the desired amount of output demanded by all the agents in the economy exactly equals the amount produced in a given time period.

b) An economy can be said to be in equilibrium when the production plans of the firms and the expenditure plans of the households match.

SIMILAR QUESTIONS:

1. **Describe the assumptions of Circular flow in a simple two sector model by J.M , Keynes**

A. Refer the 1st side heading

2. **In how many ways the equilibrium under two sector model be mentioned?**

A. Refer the 3rd side heading".

Q.No.3. Write about Consumption Function in the Keynesian theory of income determination. (B) (SM, RTP M18)

1. **Consumption Function:**

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

$$C = f(Y)$$

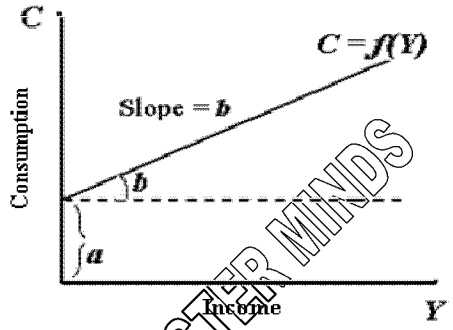
According to Keynes the consumption function in the form of equation is as follows:

$$C = a + bY$$

Where, C = aggregate consumption expenditure; Y = total disposable income;

a is a constant term i.e. the positive value of consumption at zero level of disposable income; *b*, the slope of the function i.e. Marginal Propensity to Consume, ($\Delta C / \Delta Y$).

2. **The Keynesian Consumption Function:**



From the above graph:

a) 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).

b) 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.

c) The intercept for the consumption function, *a,* can be expressed as a measure of the effect on consumption variables other than income.

Conclusion: 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. $0 < b < 1$.

Q.No.4. Describe the components of aggregate demand in two-sector model using the relationship between income and consumption graphically. (B) (SM)

IN A TWO SECTOR MODEL ECONOMY:

1. **AGGREGATE DEMAND (AD):** In a simple two-sector economy aggregate demand (AD) or aggregate expenditure consists of only two components:

a) Aggregate demand for consumer goods (C),

b) Aggregate demand for investment goods (I)

$$AD = C + I$$

Of the two components, consumption expenditure accounts for the highest proportion of the GDP.

Assumptions:

i) Investment 'I' is assumed to be determined exogenously and is constant in the short run.

ii) The income of the consumer must be either spent or saved and hence,

- Consumption is a function of income i.e. C = f(Y) and also
- Saving is a function of income i.e. S = f(Y).

2. **Relation between income and consumption:** As the theory of the consumption-income relationship also establishes the saving-income relationship, the concepts of Consumption Function, MPC; APC; Saving Function; MPS; and APS are to be considered for the explanation.

3. **Consumption Function:** Refer 1st point of 3rd question.

4. **Marginal Propensity to Consume (MPC):** MPC describes the relationship between change in consumption (ΔC) and the change in income (ΔY). It is the slope of consumption function and is represented by 'b'. **(MTP M18)**

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

Proportionate increase in consumption will be less than proportionate increase in income. So, MPC is always less than unity, but greater than zero, i.e., $0 < b < 1$

5. **Average Propensity to Consume (APC):** The ratio of total consumption to total income is known as the average propensity to consume (APC).

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

6. **The Saving Function:** It shows the level of saving (S) at each level of disposable income (Y).

Y = C + S (Where Y = disposable income)

Therefore, S = Y - C.

7. **The Marginal Propensity to Save (MPS):** The marginal propensity to save is the increase in saving per unit increase in disposable income.

The slope of the saving function is the marginal propensity to save.

$$MPS = \frac{\Delta S}{\Delta Y} = 1 - b$$

Also, MPC + MPS = 1; we have MPS $0 < b < 1$.

8. **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.

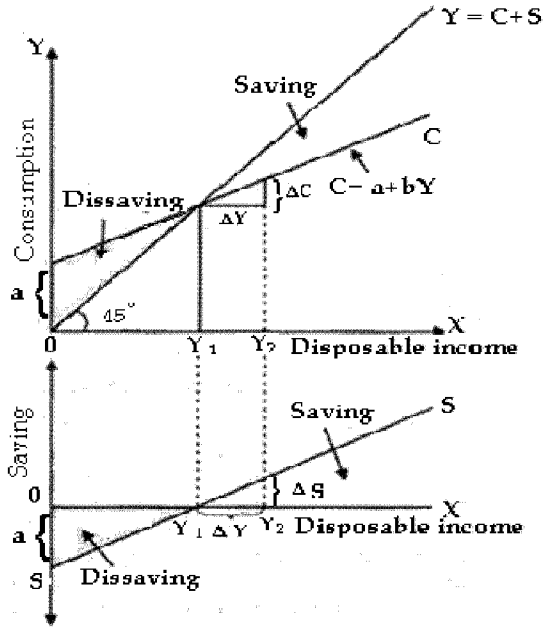
$$APS = \frac{\text{Total Saving}}{\text{Total Income}} = \frac{S}{Y}$$

The table below shows the relationship between income consumption and saving.

Relationship between Income and Consumption

Income (Y)	Consumption (C)	Savings (S)	APC (C/Y)	APS (S/Y)	MPC (ΔC /ΔY)	MPS (ΔS /ΔY) (1-MPC)
0	500	(500)	∞	(∞)	-	-
1,000	1,250	(250)	1.25	(0.25)	0.75	0.25
2,000	2,000	0	1.00	0	0.75	0.25
3,000	2,750	250	0.92	0.08	0.75	0.25
6,000	5,000	1,000	0.83	0.17	0.75	0.25
10,000	8,000	2,000	0.80	0.20	0.75	0.25

9. The Consumption and Saving Function:



From the above graph:

a) The 45° line shows the income - consumption relation with Y = C (AD = Y) at all levels of income.

b) All points on the 45° line indicate that aggregate expenditure (C+I) equal aggregate output (Y).

c) Because aggregate expenditures equal total output for all points along the 45-degree line, the line maps out all possible equilibrium income levels.

d) As long as the economy is operating at less than its full-employment capacity, producers will produce any output along the 45-degree line that they believe purchasers will buy.

SIMILAR QUESTIONS:

1. Define 1) consumption function, 2) MPC, 3) APC, 4) Saving Function, 5) MPS, 6) APS.

A. Write definition and formula of the concerned.

2. Define Aggregate Demand in Two sector model economy.

A. Refer 1st Point

Q.No.5. How is National Income determined under Keynesian two-sector model economy? (Or) Explain national income determination in a two sector economy? (A) (SM)

DETERMINATION OF NATIONAL INCOME BY USING TWO SECTOR MODEL:

According to Keynesian theory of income determination, the equilibrium level of national income is a situation in which aggregate demand (C+ I) is equal to aggregate supply (C + S)

i.e. when AD = AS,

C + I = C + S (or) I = S

In a two sector economy:

1. AGGREGATE DEMAND (or) AGGREGATE EXPENDITURE (AD):

a) The aggregate demand (C+I) refers to the total spending in the economy i.e. it is the sum of demand for the consumer goods (C) and investment goods (I) by households and firms respectively.

b) Aggregate demand represents realized value by the households

c) Aggregate demand depends on households plan to consume and to save.

d) The AD 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.

e) The AD line is flatter than the 45-degree line because, as income rises, consumption also increases, but by less than the increase in income.

2. **AGGREGATE SUPPLY (or) AGGREGATE INCOME (AS):**

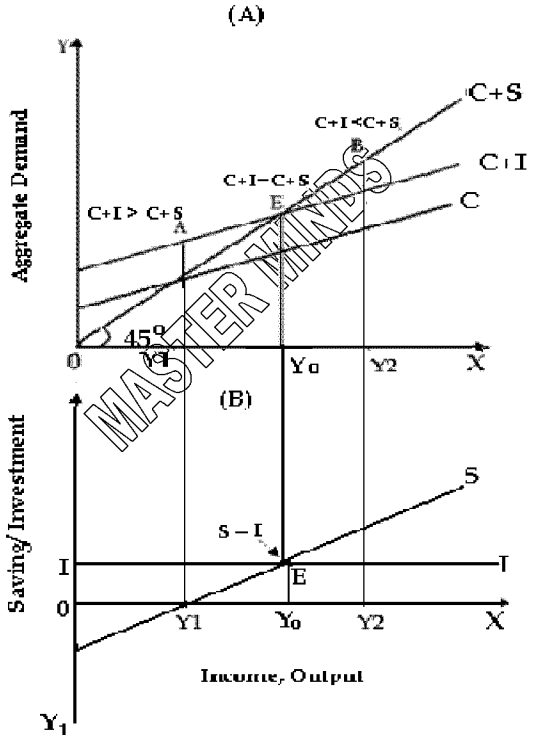
a) Aggregate Supply (C + S) refers to the total supply of goods and services available in a market from producers.

b) Aggregate supply represents aggregate value expected by business firms

c) Aggregate supply depends on the producers' plan to produce goods and services.

3. **Equilibrium under two sector Model:** The aggregate demand is equal to the aggregate supply **(or)** The aggregate expenditure equals aggregate income **(or)** The households' plan must coincide with producers' plan **(or)** Expected value by the firms equals realized value by the households.

4. **Determination of Equilibrium Income: Two Sector Model**



5. **The figure depicts the following:**

a) Income is measured along the horizontal axis and the components of aggregate demand, C and *I*, are measured along the vertical axis.

b) Since the autonomous expenditure component (*I*) does not depend directly on income, the aggregate expenditure schedule (C+I) lies above the consumption function by a constant amount.

c) Equilibrium level of income is such that aggregate demand equals aggregate income.

d) Only at point E with output (Y_0), aggregate demand exactly equal output.

e) Since **C + S = Y,** the national income equilibrium can be written as: **Y = C + I**

In Panel B:

a) The saving schedule 'S' slopes upward because saving varies positively with income.

b) The vertical distance between the aggregate demand (C+I) and consumption line (C) is equal to planned investment spending, I.

c) The vertical distance between the consumption schedule and the 45° line also measures saving (S = Y- C) at each level of income.

d) In equilibrium Y_0, planned investment equals saving

e) Above the equilibrium level of income, Y_2, saving exceeds planned investment,

f) Below the equilibrium level of income, Y_1, planned investment exceeds saving.

Note:

a) This condition applies only to an economy in which there is no government and no foreign trade. i.e. aggregate demand equals consumption plus investment, Y = C + I.

b) Since income is either spent or saved, *Y = C + S.*

c) Putting the two together, we have *C + S = C* + I, or *S* = I.

6. ***Reasons why other points (rather than Y_0) on the graph are not points of equilibrium:***

a) At Y_1 level of income *(below Y_0), the aggregate demand exceeds income and also investments exceed savings. This excess demand makes businesses to sell more than what they currently produce. They will react by hiring more workers and expanding production. This will increase the nation's aggregate income. It also follows that with demand outstripping production, desired investment will exceed actual investment.*

b) At Y_2 level of income *(above Y_0), output exceed demand. The business firms would be unable to sell their current output. It shows that they made larger inventory investments than they planned and their actual inventories would increase. Therefore, there will be a tendency for output to fall. This process continues till output reaches Y_0 (where there is no tendency for output to change).*

7. **Controversies raised in Keynesian two sector model economy:**

a) *Aggregate demand will not always be equal to aggregate supply i.e. there is no reason for C + I and C + S to be always equal.*

b) *Keynesian equilibrium need not take place at full employment. It is possible that the rate of unemployment is high.*

c) *In the Keynesian model, during the Great Depression neither wages nor interest rates will decline in the face of 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.*

SIMILAR QUESTIONS:

1. **Define aggregate demand or aggregate expenditure (AD)**

A. Refer the 1st side heading

2. **Define aggregate supply (as) or aggregate income**

A. Refer the 2nd side heading

3. **Equilibrium i.e. Established in a two sector model in the determination of national income can be expressed in how many ways?**

A. Refer the 3rd side heading

4. **What are the controversies raised by keynes in two sector model economy?**

A. Refer the 7th side heading

5. **If aggregate demand exceeds income what will be it's consequences in a two-sector model economy?**

A. Refer point (a) in 6th side heading

6. **If output exceeds demand what will be it's consequences in a two-sector model economy?**

A. Refer point (b) in 6th side heading

Q.No.6. Define Multiplier. Explain the Functioning of Multiplier? (B) (SM)

INVESTMENT MULTIPLIER:

a) The multiplier refers to the phenomenon whereby a change in an injection of expenditure will lead to a proportionately larger change (or multiple change) in the level of national income.

b) Multiplier explains how many times the aggregate income increases as a result of an increase in investment. When the level of investment increases by an amount say ΔI, the equilibrium level of income will increase by some multiple amounts, ΔY.

c) Multiplier expresses the relationship between an initial increment in investment and the resulting increase in aggregate income.

d) The ratio of ΔY to ΔI is called the investment multiplier.

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

Functioning of Multiplier:

a) The size of the multiplier effect is given by $\Delta Y = k \Delta I$.

b) MPC is the determinant of the value of the multiplier

c) There exists a direct relationship between MPC and the value of multiplier.

d) 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.

e) The higher the MPS, the lower will be the value of multiplier and vice-versa.

f) The value of the multiplier is the reciprocal of MPS

g) The multiplier shows how shocks to one sector are transmitted throughout the economy.

Q.No.7. What is the effect of changes in autonomous investment on investment multiplier under two-sector model economy? Explain graphically. (B) (SM)

INVESTMENT MULTIPLIER:

a) The multiplier refers to the phenomenon whereby a change in an injection of expenditure will lead to a proportionately larger change (or multiple change) in the level of national income.

b) The ratio of ΔY to ΔI is called the investment multiplier,

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

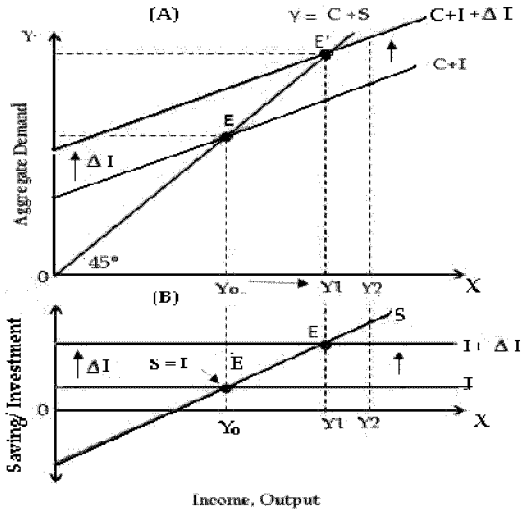
c) The size of the multiplier effect is given by $\Delta Y = k \Delta I$.

In our two-sector model, a change in aggregate demand may be caused by change in consumption expenditure or in business investment or in both.

Since Consumption expenditure is a stable function of income, changes in income are primarily from changes in the autonomous components of aggregate demand, especially from changes in the unstable investment component.

An increase in investment causes an upward shift in the aggregate demand *function.*

Effect of Changes in Autonomous Investment:



From the above graph:

a) An increase in autonomous investment by ΔI shifts the aggregate demand schedule from C + I to C + I + ΔI.

b) Thus due to the operation of the investment multiplier equilibrium shifts from E to E_1 and the equilibrium income increases more than proportionately from Y_0 to Y_1.

c) The increase in national income (ΔY) is the result of increase in investment (ΔI), the multiplier is called 'Investment multiplier'.

For example,

If a change in investment of Rs. 2000 million causes a change in national income of Rs. 6000 million, then the multiplier is 6000/2000 = 3.

Thus multiplier value 3 tells us that for every Re. 1 increase in desired investment expenditure, there will be Rs. 3 increase in equilibrium national income.

SIMILAR QUESTION:

1. **Define Investment Multiplier.**

A. Refer points a) & c)

Q.No.8. Outline the relationship between marginal propensity to consume and multiplier? (B) (For Student's Self-study) (SM)

1. **Marginal Propensity to Consume (MPC):**

MPC describes the relationship between change in consumption (ΔC) and the change in income (ΔY). The value of the increment to consumer expenditure per unit of increment to income is termed the Marginal Propensity to Consume (MPC).

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

MPC is always less than unity, but greater than zero, i.e., $0 < b < 1$. Also, MPC + MPS = 1.

2. **Investment multiplier:**

The increase in national income (ΔY) is the result of increase in investment (ΔI), the multiplier is called 'investment multiplier.'

The ratio of ΔY to ΔI is called the investment multiplier,

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

The size of the multiplier effect is given by $\Delta Y = k \Delta I$.

3. **Relation between MPC and Multiplier:**

$$\frac{\Delta Y}{\Delta I} = \frac{1}{1 - MPC} = \frac{1}{MPS}$$

a) MPC is the determinant of the value of the multiplier.

b) There exists a direct relationship between MPC and the value of multiplier (i.e. higher the MPC, more will be the value of the multiplier, and vice-versa).

c) The maximum value of multiplier is infinity when the value of MPC is one and therefore the economy decides to consume the whole of its additional income.

d) On the contrary, higher the MPS, lower will be the value of multiplier and vice-versa. i.e. the value of the multiplier is the reciprocal of MPS.

Example: If the value of MPC is 0.75, then the value of the multiplier is:

$$\frac{\Delta Y}{\Delta I} = \frac{1}{1 - MPC} = \frac{1}{1 - 0.75} = \frac{1}{0.25} = 4$$

Q.No.9. What is the effect of Income leakages on multiplier? (A) (SM, RTP N18)

Leakages: 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.

a) Income i.e. not spent on currently produced consumption goods and services may be regarded as having leaked out of income stream.

b) If the increased income goes out of the cycle of consumption expenditure, there is a leakage from income stream. It reduces the effect of multiplier.

c) The more powerful these leakages are the smaller will be the value of multiplier.

The Leakages are caused due to:

1. Even though there is an increase in income because of progressive rates of taxation there is no considerable increase in consumption.
2. High liquidity preference and idle saving.
3. Holding of cash balances and an equivalent fall in MPC.
4. Increased demand for consumer goods being met out of the existing stocks or through imports.
5. Additional income spent on purchasing existing wealth or purchase of government securities and shares from shareholders or bond holders.
6. Undistributed profits of corporations.
7. Part of increment in income used for payment of debts.
8. Case of full employment additional investment will only lead to inflation, and
9. Scarcity of goods and services despite having high MPC.

Conclusion:

The MPC on which the multiplier effect of increase in income depends, is high in under developed countries; 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.*

SIMILAR QUESTION:

1. **Describe the rationale behind multiplier? Point out the factors that weaken the multiplier**

A. Refer the whole answer except conclusion

Q.No.10. Illustrate the circular flow in a Three Sector Economy (B) (SM)

Aggregate demand in the three sector model

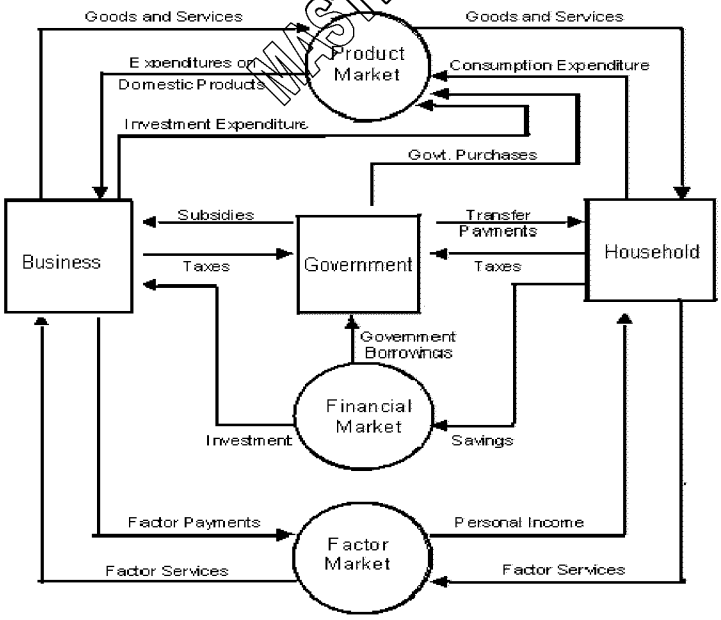
Aggregate demand in the three sector model of closed economy (neglecting foreign trade) consists of three components namely, household consumption(C), desired business investment demand(I) and the government sector's demand for goods and services(G). Thus in equilibrium, we have

Y = C+I+G

Assumptions:

1. Since there is no foreign sector, GDP and national income are equal.
2. Prices are fixed,
3. All variables are real variables and all changes are in real terms.
4. Each of the variables in the model is a flow variable.

Circular Flow in a Three Sector Economy:



From the above flow chart, we can find that the government sector adds the following key flows to the model:

a) Taxes on households and business sector are used to fund government purchases, transfer payments to household sector and subsidy payments to the business sector.

b) Government purchases goods and services from business sector and factors of production from household sector.

c) Government borrowing from financial markets are used to finance the deficits occurs when taxes fall short of government purchases

Elucidation of the flow chart:

a) There are two out flows 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.

b) The leakages of household sector do not mean that the total demand must fall.

c) The saving leakage flows into financial markets *(i.e. part of savings is held in the form of financial assets such as currency, bank deposits, bonds, equities, etc.).*

d) The tax flow goes to the government sector.

e) When the additional demand arises for investment from the business sector and government sector, in terms of the circular flow, these are injections.

f) The investment injection is shown as a flow from financial markets to the business sector.

SIMILAR QUESTION:

1. What are the assumptions of circular flow in a three sector economy by Keynes?

A. Refer the side heading of "Assumptions".

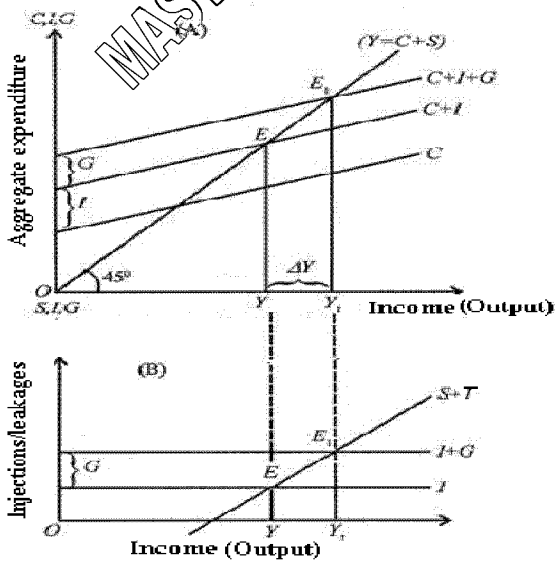
Q.No.11. How is equilibrium income determined under three sector Keynesian model? (A) (SM)

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 Equilibrium Income: Three Sector Model:

Aggregate demand in the three sector model of closed economy 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



Explanation of the graph:

a) The variables measured on the vertical axis are C, I and G.

b) The autonomous expenditure components namely, investment and government spending do not directly depend on income and are exogenous variables

c) In panel B of the graph the lines of autonomous expenditure components (I; I+G) are horizontal as their level does not depend on Y.

d) Therefore, C + I + G schedule lies above the consumption function by a constant amount.

e) The line S + T in the graph plots the value of savings plus taxes. It slopes upwards because saving varies positively with income. *(Level of tax receipts (T) is decided by policy makers).*

f) 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).

g) In equilibrium, it is also true that the (S + T) schedule intersects the (I + G) horizontal schedule.

Reasons why other points on the graph are not points of equilibrium:

At level of income below Y:

a) *Aggregate demand exceeds income; the (C + I + G) schedule is above the 45° line. At this point I + G is greater than S + T, shown in panel B*

b) *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.*

At levels of income above Y_1:

a) *Output will exceed demand; people are not willing to buy all that is produced.*

b) *Excess inventories will accumulate, leading businesses to reduce their future production.*

c) *Employment will subsequently decline.*

d) *Output will fall back to the equilibrium level.*

Conclusion: *It is only at Y that output is equal to aggregate demand where there is no unintended inventory shortfall or accumulation and no tendency for output to change.*

Note: *The change in total spending followed by changes in output and employment, is what will restore equilibrium in the Keynesian model, but not changes in prices.*

Q.No.12. Illustrate the Circular Flow in a Four Sector Economy. (A) (SM)

The four sector model includes all four macroeconomic sectors,

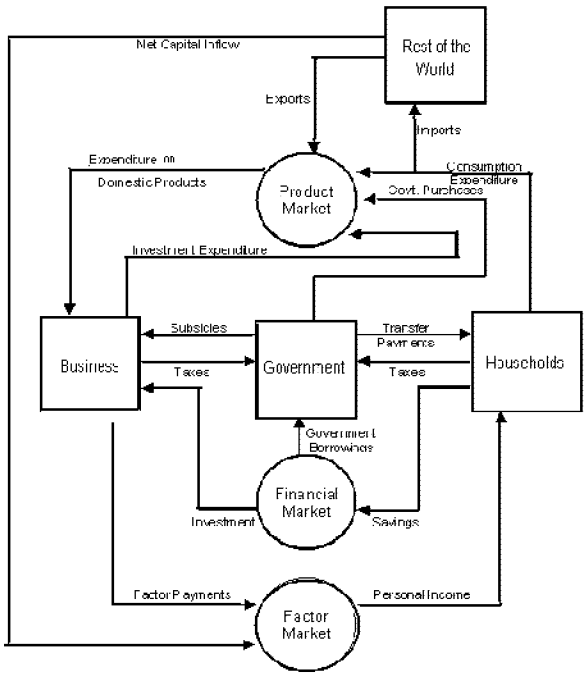
The household sector,

The business sector,

The government sector, and

The foreign sector (it includes households, businesses, and governments that reside in other countries).

Circular Flow in a Four Sector Economy:



a) The net exports(X-M) are incorporated into the four sector model of income determination.

b) In the four sector model, there are three additional flows namely: exports, imports and net capital inflow (the difference between capital outflow and capital inflow).

c) The C+I+G+(X-M) line indicates the total planned expenditures of consumers, investors, governments, and foreigners (net exports) at each income level. In equilibrium, we have

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

Q.No.13. How is equilibrium income determined under four sector Keynesian model? (B) (SM)

Determination of Equilibrium Income in Four Sector Model:

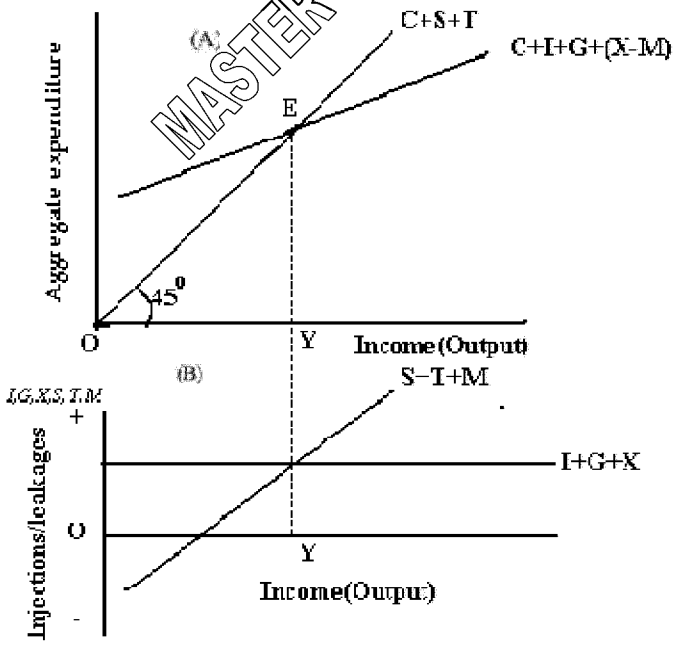
a) The net exports(X-M) are incorporated into the four sector model of income determination.

b) The domestic economy trades goods with the foreign sector through exports and imports.

Exports: Exports are the injections into the national income. Injections increase the level of income. Exports represent foreign demand for domestic output and are part of aggregate demand. The demand for exports depends on foreign income and is therefore exogenously determined.

Imports: Imports act as leakages or outflows of national income. Leakages decrease the level of income. Since imports are not demand 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 (i.e. increase in import demand per unit increase in GDP).

Net Exports: Imports are subtracted from exports to derive net exports, which is the foreign sector's contribution to aggregate expenditures



From the above graph:

a) Equilibrium is identified as the intersection between the C + I + G + (X - M) line and the 45-degree line. The equilibrium income is Y.

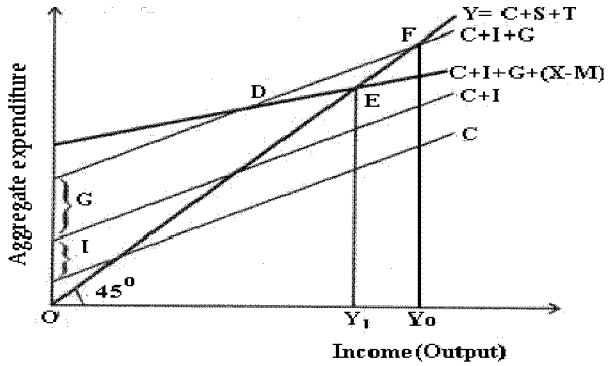
b) From panel B, it is clear that the leakages(S+T+M) are equal to injections (I+G+X) only at equilibrium level of income.

c) 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.

Q.No.14. Explain the effects on income when Imports are greater than Exports under four sector economy. (B) (SM)

Introduction: Refer Q.NO:12 up to imports topic.

Effects on Income When Imports are Greater than Exports:



The graph depicts a case of X<M.

When the foreign sector is included in the model and assuming M > X, the aggregate demand schedule C+I+G shifts downward with equilibrium point shifting from F to E and causes a reduction in national income from Y_0 to Y_1.

Q.No.15. What are the effects of change in demand for a country's exports or imports on equilibrium income? (SM)

An 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.

a) The autonomous expenditure multiplier in a four sector model includes the effects of foreign transactions and is stated $\frac{1}{(1-b+v)}$ (Where v is the propensity to import which is greater than zero). But the multiplier in a closed economy is $\frac{1}{(1-b)}$

b) The greater the value of v, the lower will be the autonomous expenditure multiplier.

c) The more open an economy is to foreign trade, (the higher v is) the smaller will be the response of income to aggregate demand shocks.

d) The higher the value of v, larger the proportion of this induced effect on demand for foreign but not for domestic consumer goods.

e) Consequently, the induced effect on demand for domestic goods and, hence on domestic income will be smaller.

f) 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.

g) 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.

Conclusion:

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 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.

SIMILAR QUESTION:

1. **How do imports and exports with the rest of the world affect the level of income and output?**

A. Refer g, h, i, j points of the answer and conclusion

Q.No.16. How does Keynesian theory of income and employment, national income affects the aggregate effective demand? (B) (SM)

a) According to the Keynesian theory of income and employment, national income depends upon the aggregate effective demand.

b) If the aggregate effective demand falls short of that output it will result in unemployment in the economy. Consequently, there will be a gap between the economy's actual and optimum potential output.

c) If the aggregate effective demand exceeds the economy's full employment output, it will result in inflation.

d) It is not necessary that the equilibrium aggregate output will also be the full employment aggregate output.

SIMILAR QUESTION:

1. **Outline the changes in equilibrium aggregate income on account of changes in its determinants?**

A. Refer the whole answer

QUESTIONS FOR ACADEMIC INTEREST - FOR STUDENT SELF STUDY

Q.No.17. Explain the concepts of Marginal Propensity to Consume (MPC) and Average Propensity to Consume (APC). (B) (SM)

1. **Marginal Propensity to Consume (MPC):** MPC describes the relationship between change in consumption (ΔC) and the change in income (ΔY). The value of the increment to consumer expenditure per unit of increment to income is termed the Marginal Propensity to Consume (MPC).

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

   a) Although the MPC is not necessarily constant for all changes in income (in fact, the MPC tends to decline at higher income levels), most analysis of consumption generally works with a constant MPC.

   b) Marginal Propensity to Consume (MPC) is always less than unity, but greater than zero, i.e., $0 < b < 1$

2. **Average Propensity to Consume (APC):** The ratio of total consumption to total income is known as the average propensity to consume (APC).

$$APC = \frac{\text{Total Consumption}}{\text{Total Income}} = \frac{C}{Y}$$

Q.No.18. Explain the concepts of Saving Function, Marginal Propensity to Save (MPS) and Average Propensity to Save (APS). (B) (SM)

1. **The Saving Function:**
   - **a)** The saving function shows the level of saving (S) at each level of disposable income (Y).
   - **b)** The intercept for the saving function, (-a) is the (negative) level of saving at zero level of disposable income at consumption equal to 'a'.
   - **c)** Y = C + S (i.e. Disposable income is equal to consumption plus saving). Therefore, S = Y – C.
   - **d)** Thus, when we represent the theory of the consumption-income relationship, it also implicitly establishes the saving-income relationship.
2. **The Marginal Propensity to Save (MPS):**
   - **a)** The marginal propensity to save is the increase in saving per unit increase in disposable income.
   - **b)** The slope of the saving function is the marginal propensity to save.
   - **c)** 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.
   - **d)** This increment to saving per unit increase in disposable income (1 - b) is called the marginal propensity to save (MPS).

$$MPC = \frac{\Delta S}{\Delta Y} = 1 - b$$

   - **e)** Also, MPC + MPS = 1; we have MPS $0 < b < 1$.
   - **f)** 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 increase as income increases.
3. **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.

$$APS = \frac{\text{Total Saving}}{\text{Total Income}} = \frac{S}{Y}$$

Q.No.19. Define consumption function? Examine what would happen if aggregate expenditures were to exceed the economy's production capacity? (B) (RTP M18)

Consumption function is the functional relationship between aggregate consumption expenditure and aggregate disposable income, expressed as C = f (Y); shows the level of consumption (C) corresponding to each level of disposable income (Y)

Aggregate expenditures in excess of output lead to a higher price level when the economy reaches full employment. Nominal output will increase, but it merely reflects higher prices, rather than additional real output.

Q.No.20. Describe the Components of Aggregate Expenditure in Two, Three and Four sector economy models. (B) (SM)

The components of aggregate expenditure in two, sector economy model:

In a simple two-sector economy aggregate demand (AD) consists of only two components:

1. Aggregate demand for consumer goods (C), and
2. Aggregate demand for investment goods (I)

$$AD = C + I$$

Note:

Of the two components, consumption expenditure accounts for the highest proportion of the GDP.

In the short-run investment (I) is constant.

The components of aggregate expenditure in three sector economy model:

Aggregate demand in the three sector model of closed economy consists of three components namely,

1. household consumption(C),
2. desired business investment demand(I) and
3. The government sector's demand for goods and services (G).

Thus in equilibrium, we have

$$Y = C + I + G$$

Note: Since there is no foreign sector, GDP and national income are equal. The multiplier in a closed economy is $\frac{1}{(1-b)}$

The components of aggregate expenditure in four sector economy model:

The four sector model includes all four macroeconomic sectors,

a) The household sector,

b) The business sector,

c) The government sector, and

d) The foreign sector (includes households, businesses, and governments that reside in other countries)

In equilibrium, we have

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

Note: The autonomous expenditure multiplier in a four sector model includes the effects of foreign transactions and is stated as $\frac{1}{(1-b+v)}$

DIFFERENCES - FOR STUDENT'S SELF STUDY

Q.No.21. Elucidate the relationship between Consumption Function and Saving Function? (B) (SM)

The Consumption Function:

The positive relationship between consumption spending and disposable income is described by the consumption function.

$$C = f(Y)$$

According to Keynes the consumption function is as follows

$$C = a + bY$$

Where C = aggregate consumption expenditure;

Y = total disposable income;

a is a constant term

b, the slope of the consumption function i.e. MPC = $\Delta C / \Delta Y$).

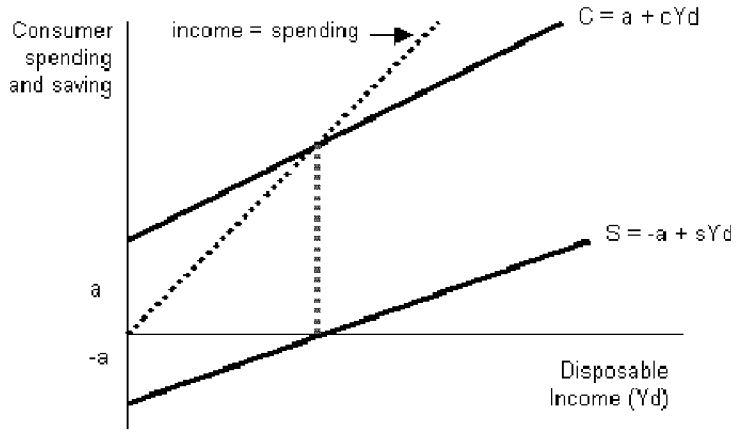
The Saving Function:

The saving function shows the level of saving (S) at each level of disposable income (Y). The intercept for the saving function, (-a) is the (negative) level of saving at zero level of disposable income at consumption equal to 'a'.

Y = C + S (Disposable income = consumption plus saving).

Therefore, S = Y - C.

Relationship between Consumption Function and Saving Function:



According to the Keynesian consumption function, savings are positively related to the level of disposable income. At low levels of income, total spending may exceed income causing dis-saving. As income rises, total savings rise - the gradient of the savings function is given by the marginal propensity to save

Q.No.22. Differentiate Leakages and injections in a circular flow of income stated by J.M. Keynes. (B) (M18 - 2M)

Basis of difference	Leakages	Injections
Definition	A leakage is an outflow or withdrawal of income from the circular flow.	An injection is non-consumption expenditure.
Scope	Leakages are money leaving the circular flow and therefore, not available for spending on currently produced goods and services.	It is an expenditure on goods and services produced within the domestic territory but not used by the domestic household for consumption purposes.
Effects	Leakages reduce the flow of income.	Injections are exogenous additions to the circular flow and add to the total volume of the basic circular flow.
Examples	Savings, Imports and Taxes	Investment, Government Spending (Government Expenditure), Exports etc.

Q.No.23. Differentiate Marginal Propensity to Consume and Marginal Propensity to Save. (C) (SM)

Basis of difference	Marginal Propensity to Consume (MPC)	Marginal Propensity to Save (MPS)
Meaning	MPC is the increase in Consumption, for every unit of increase in Disposable Income.	MPS is the increase in Saving, for every unit of increase in Disposable Income.
Formula	MPC = **b** = $\frac{\Delta C}{\Delta Y}$	MPS = $\frac{\Delta S}{\Delta Y}$ (or) [1 - MPC] (or) [1 - b]

Nature	As Income (Y) increases, Consumption (C) also tends to increase, however, the increase in Consumption will be less than the increase in Income. Hence, "b" lies between 0 and 1. (0 < b < 1).	As Income (Y) increases, Saving (S) also tends to increase. Also, since MPS+MPC = 1, it is inferred that MPC lies between 0 and 1. (0 < MPS < 1).

Note: MPS or (1 - b) is constant for all levels of Income and Consumption. Hence, MPC is also a constant.

Q.No.24. Distinguish Average Propensity to Consume and Average Propensity to Save. (C) (SM)

Basis of difference	Average Propensity to Consume (APC)	Average Propensity Save (APS)
Formula	$APC = \frac{C}{Y} = \frac{\text{Total Consumption}}{\text{Total Income}}$	$APS = \frac{S}{Y} = \frac{\text{Total Saving}}{\text{Total Income}}$
Nature	APC shows a **decreasing** trend, as Income increases	APS shows an **increasing** trend, as Income decreases.

TEST YOUR KNOWLEDGE

1. Write the equation of aggregate demand and aggregate income in an open economy?
2. Write the equation of aggregate demand and aggregate income in a closed economy?
3. Write the equation of aggregate demand and aggregate income in a two sector economy?
4. What is the equation and slope of the consumption function?
5. What is the equation and slope of the saving function?
6. Write an equation explaining the relation between the slope of the consumption function and the slope of the saving function?
7. If more powerful the leakages what will be the value of multiplier?
8. If the aggregate effective demand falls short of that output will it result in full employment or unemployment in the economy?
9. Write an equation to the multiplier in a closed economy.
10. Write an equation to the multiplier in an open economy.
11. If the value of MPC is 0.75, then what is the value of the multiplier?
12. If the maximum value of multiplier is infinity then what will be the value of MPC?
13. What is the value of the reciprocal of MPS is known for?
14. In addition to consumption expenditure what are the two flows out of the household sector
15. Differentiate between leakages and injections with examples.
16. Which leakage flows into financial markets? Either saving flows or the flow of tax payments.
17. Which leakage flows into government sector? Either saving flows or the flow of tax payments
18. The investment injection is shown as a flow between which areas?
19. Does the multiplier can be compared to the 'ripple effect' of water?

LIST OF FORMULAE

Sector Model	Aggregate Demand (Y)	Aggregate Supply (Y)	Inference	
			Leakages	Injections
Two	AD = C + I	AS = C + S	S	I
Three	AD = C + I + G	AS = C + S + T	S, T	I, G
Four	AD = C + I + G + (X - M)	AS = C + S + T + M	S, T, M	I, G, X

1. C = a + bY; Where, C = Consumption; a = Constant, b = Slope of Consumption (or) Marginal Propensity to Consume and Y = Personal Disposable Income.
2. Y = C+S; Where, Y = Personal Disposable Income, C = Consumption, S = Savings.
3. APC = $\frac{\text{Total Consumption}}{\text{Total Income}} = \frac{C}{Y}$
4. APS = $\frac{\text{Total Saving}}{\text{Total Income}} = \frac{S}{Y}$
5. MPC = $\frac{\Delta C}{\Delta Y}$ = b
6. MPS = $\frac{\Delta S}{\Delta Y}$ = 1 - b
7. MPC + MPS = 1
8. Investment Multiplier = $k = \frac{\Delta Y}{\Delta I} = \frac{1}{MPS} = \frac{1}{1 - MPC} = \frac{1}{1 - b}$
9. Multiplier in a closed economy = $\frac{1}{(1-b)}$
10. Multiplier in an open economy = $\frac{1}{(1-b+v)}$ (Where, v = Marginal Propensity to import)
11. Marginal Propensity to Import (v) = $\frac{\Delta M}{\Delta Y}$
12. Change in disposable income = $\Delta y_d = (\Delta Y - \Delta t)$

    Δy_d = Change in disposable income

    Δy = Change in National Income

    Δt = Change in taxes
13. Tax Multiplier = $\frac{-MPC}{1-MPC}$ or $\frac{-MPC}{MPS}$

    Note: If there is a Tax-Cut, then the multiplier is +, because there is now more money in the circular flow.

PROBLEMS FOR CLASS ROOM DISCUSSION

1. In a two sector economy, the business sector produces 7,000 units at an average price of Rs. 5.
   - **a)** What is the money value of output? ***(ANS.: Rs. 35,000)***
   - **b)** What is the money income of households? ***(ANS.: RS. 35,000)***
   - **c)** If households spend 80 percent of their income, what is the total consumer expenditure? ***(ANS.: RS. 28,000)***

d) What is the total money revenues received by the business sector? ***(ANS.: RS. 28,000)***

e) What should happen to the level of output? ***(ANS.: EXPECTED TO DECREASE OUTPUT)***

(SM, N18 - 5M)

2. Assume that an economy's consumption function is specified by the equation C = 500 + 0.80Y. ***(SM)***

a) What will be the consumption when disposable income (Y) is Rs. 4,000, Rs. 5,000, and Rs. 6,000? ***(ANS.: RS. 3,700; RS. 4,500; 5,300)***

b) Find saving when disposable income is Rs. 4,000, Rs. 5,000, and Rs. 6,000.

(ANS.: RS. 300; RS. 500; RS. 700)

c) What amount of consumption for consumption function C is autonomous?

(ANS.: RS. 500 FOR ALL LEVELS OF INCOME)

d) What amount is induced when disposable income is Rs. 4,000? Rs. 5,000? Rs. 6,000?

(ANS.: RS. 3,200; RS. 4,000; 4,800)

3. Calculate the Average Propensity to Consume (APC) and Average Propensity to Save (APS) from the following data:

Income: Rs. 4,000; Consumption: Rs. 3,000 ***(N18 - 2M) (ANS.: APC: 0.75; APS: 0.25)***

4. Calculate the Marginal Propensity to Consume (MPC) and Marginal Propensity to Save (MPS) from the following data:

Income (Y)	Consumption (C)	Level
Rs. 8,000	Rs. 6,000	Initial level
Rs. 12,000	Rs. 9,000	Changed level

(M18 - 2M) (ANS.: MPC = 0.75; MPS = 0.25)

5. Find the value of the multiplier when (a) MPC is 0.2 (b) MPC is 0.5 (c) MPC is 0.8

(SM) (ANS.: A) 1.25; B) 2; C) 5)

(SOLVE PROBLEM NO. 1, 2 OF ASSIGNMENT PROBLEMS AS REWORK)

6. An increase of investment by Rs. 600 crores resulted in an increase in national income by 2,400 Crores. Find MPC and MPS. ***(MTP M18) (ANS.: MPC = 0.75; MPS = 0.25)***

(SOLVE PROBLEM NO. 3, 4, 5, 6 OF ASSIGNMENT PROBLEMS AS REWORK)

7. For the linear consumption function is C = 700 + 0.8Y; I is Rs. 1,200 and Net exports X-M = 100. Find equilibrium output? ***(SM) (ANS: Y = RS. 10,000)***

8. Given the empirical consumption function C= 100+0.75 Y and I = 1500, calculate equilibrium level of national income. What would be the consumption expenditure at equilibrium level national income?

(ANS.: Y = RS. 4,900)

9. Suppose that the consumption function is C = 200 + 0.6Y and the income level is 2000 billion. Calculate what consumers intend to consume and save at this income level. ***(MTP M18)***

(ANS.: CONSUMPTION: 1,400 BILLION; SAVINGS: 600 BILLION)

10. Suppose you have the following information about a closed economy:

C = 50 + 0.80 Y

I = 200

G = 100

Where C is consumption, I is investment, G is Government expenditure and Y is income.

a) Find out the equilibrium level of income. ***(ANS.: RS. 1,750)***

b) Suppose G increases to 125 what is the new equilibrium level of income? ***(ANS.: RS. 1,875)***

c) What level of G is needed to achieve a target income of 2000? ***(ANS.: RS. 150)***

11. Given the values of Marginal Propensity to Consume (MPC) = 0.60 and Marginal Propensity to Import = 0.10. The value of Foreign Trade Multiplier (FTM) is ***(ANS.: 2)***

12. An Economy is characterised by the following equations: ***(RTP N18)***

Consumption (C) = 100 + 0.9 Y_d | Tax (T) = 50

Investment (I) = 100 | X (Exports) = 200

Government Expenditure (G) = 120 | M (Imports) = 100+ 0.15 Y

i) What is the equilibrium Income? ***(ANS.: Y = 1,500)***

ii) Calculate trade balance. ***(ANS.: DEFICIT: 125)***

iii) What is the value of Foreign Trade Multiplier? ***(ANS.: FTM: 4)***

13. For an Economy with the following specifications ***(RTP M18)***

Consumption, C = 50+0.75 Y_d | Transfer Payments, R= 110

Investment, I = 100 | Income Tax = 0.2Y

Government Expenditure, G = 200

i) Find out the equilibrium of income and the value of expenditure multiplier.
(ANS.: Y = 1,081.25 CRORES; EXP. MULTIPLIER: 2.5)

ii) If autonomous taxes worth Rs. 25 Crores are added. Find out equilibrium level of Income.
(ANS.: Y = 1,034.375 CRORES)

iii) If the economy is opened up with exports X = 25 and imports M = 5 + 0.25Y Calculate the new level of Income and balance of Trade (Assume that there are no autonomous Taxes.)
(ANS.: NEW LEVEL OF INCOME: RS. 696.15 CRORES; ADVERSE BALANCE IN TRADE: RS. 154.04 CRORES)

14. Suppose in an economy:

Consumption Function	C = 150 + 0.75 Y_d
Investment spending	I = 100
Government spending	G= 115
Tax	T_x = 20 + 0.20 Y
Transfer Payments	T_r = 40
Exports	X = 35
Imports	M = 15 + 0.1 Y

Where, Y and Y_d are National Income and Personal Disposable Income respectively. All figures are in rupees. ***(M18 - 5M)***

Find:

i) The equilibrium level of National Income ***(ANS.: RS. 800)***

ii) Consumption at equilibrium level ***(ANS..: RS. 645)***

iii) Net Exports at equilibrium level ***(ANS.: Rs.(60) (ADVERSE BALANCE OF TRADE)***

(SOLVE PROBLEM NO. 7 OF ASSIGNMENT PROBLEMS AS REWORK)

ASSIGNMENT PROBLEMS - FOR STUDENT'S SELF PRACTICE

1. If MPC is 0.75, calculate the value of MPS and investment multiplier. ***(ANS.: 0.25; 4)***

2. If value of multiplier is 5, calculate MPC. ***(ANS.: 0.8)***

3. In an economy, investment increases by Rs 200 crores. As a result of it, total income increases by Rs. 1000 crores. Calculate MPC. ***(ANS.: 0.8)***

4. In an economy, investment increases from Rs 300 crores to 500 crores As a result of it, total income increases from Rs. 1000 to Rs. 2000 crores. Calculate value of investment multiplier and MPS. ***(ANS.: 2, 0.2)***

5. In an economy, MPC = 0.75. In this economy what will be the effect on total income if investment increases by Rs 300. ***(ANS.: 1200 CRORES)***

6. Suppose that the increase in government spending has been Rs. 5 billion. Assume that the marginal propensity to consume of people is equal to 0.6.

i) what will be the government spending multiplier ***(ANS.: 2.5)***

ii) What impact would a Rs. 5 billion increase in government expenditure have on equilibrium GDP? ***(ANS.: RS. 12.5 BILLION)***

7. Suppose that the economy is characterized by the following structural Equations:

C = 160 + 0.6 (Y - T), I = 150; G = 150; T = 100.

Where C is consumption, I is investment, G is Government expenditure, T is income tax and Y is income or output.

a) Determine the equilibrium output level. ***(ANS.: Y = 1,000)***

b) If G rises to 200, what is the new equilibrium level of output? What is the Value of the govt. expenditure multiplier? Interpret the results. ***(ANS.: NEW EQUILIBRIUM: 1125; GOVT. EXP. MULTIPLIER: 2.5 TIMES)***

c) If tax falls to 50, by how much will equilibrium output rise? What is the value of tax multiplier? ***(ANS.: NEW EQUILIBRIUM: 1075; TAX MULTIPLIER: 1.5 TIMES)***

THE END