

5. THE KEYNESIAN THEORY OF DETERMINATION OF NATIONAL INCOME

ASSIGNMENT SOLUTIONS

PROBLEM NO: 1

Given, MPC = 0.75

To find

i) $MPS = 1 - MPC = 1 - 0.75 = 0.25$

ii) Investment Multiplier (k) = $\frac{1}{MPS} = \frac{1}{0.25} = 4$

PROBLEM NO: 2

Given,

Investment Multiplier (k) = 5

i.e. $\frac{1}{MPS} = 5 \Rightarrow MPS = \frac{1}{5} = 0.2$

To find

MPC = $1 - MPS = 1 - 0.2 = 0.8$

PROBLEM NO: 3

Given, Income increases due to increase in investment

Increase in Investment (ΔI) = + 200 Crores

Increase in Income (ΔY) = +1,000 Crores

To find, MPC with the given information, Calculate Investment Multiplier (k)

$k = \frac{\Delta Y}{\Delta I} = \frac{1,000}{200} = 5$

$k = 5 = \frac{1}{MPS}$

$MPS = \frac{1}{5} = 0.2$

MPC = $1 - MPS = 1 - 0.2 = 0.8$

PROBLEM NO: 4

Given, Income increases due to increase in investment

Investment increases from Rs.300 crores to Rs.500 crores (ΔI) = + 200 Crores

Total income increases from Rs.1000 to Rs.2000 crores (ΔY) = + 1000 Crores

To find,

i) Investment Multiplier (k) = $\frac{\Delta Y}{\Delta I} = \frac{1,000}{200} = 5$

ii) $MPS = \frac{1}{k} = \frac{1}{5} = 0.2$

PROBLEM NO: 5

Given,

$$MPC = 0.75$$

$$MPS = 1 - MPC = 1 - 0.75 = 0.25$$

$$K = \frac{1}{MPS} = \frac{1}{0.25} = 4$$

Increase in Investment (ΔI) = Rs. 300

To find Increase in Income (ΔY)

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

$$4 = \frac{\Delta Y}{300} \Rightarrow \Delta Y = \text{Rs. } 1,200$$

PROBLEM NO: 6

Given,

Increase in income = 7,500 Crore

Increase in investment = 2,500 Crore

Therefore,

Investment multiplier (k) = $\Delta Y / \Delta I$ or

$$\Delta Y / \Delta I = 1/1-MPC$$

$$7,500/2,500 = 1/1-MPC$$

$$MPC = 0.67$$

PROBLEM NO: 7

$$MPC = 0.6$$

$$MPS = 0.4$$

Change in Government Expenditure (ΔGE) = Rs.5 billion

To find its effect on GDP (ΔY)

$$i) \text{ Government Expenditure Multiplier } (k) = \left(\frac{\Delta Y}{\Delta GE} \right) = \left(\frac{1}{1-MPC} \right) = \left(\frac{1}{MPS} \right)$$

$$= \frac{\Delta Y}{\Delta GE} = \left(\frac{1}{MPS} \right) = 1/0.4 = 2.5 \text{ times}$$

ii) Impact of Rs. 5 billion increase in government expenditure on equilibrium GDP (income)

$$= \frac{\Delta Y}{\Delta GE} = \left(\frac{1}{MPS} \right)$$

$$\Rightarrow \frac{\Delta Y}{5} = \frac{1}{0.4} \Rightarrow \Delta Y = \frac{5}{0.4} = 12.5 \text{ billion}$$

PROBLEM NO: 8

a) At equilibrium output, Income = Expenditure

$$\text{i.e. } Y = C + I + G$$

$$\text{or } Y = 160 + 0.6(Y - 100) + 150 + 150$$

$$Y(1 - 0.6) = 460 - 60$$

$Y = 1,000$ which is the equilibrium level of output

b) When G increases to 200

At equilibrium, Output = Expenditure

$$Y = C + I + G$$

$$\text{Or, } Y = 160 + 0.6(Y - 100) + 150 + 200$$

$$Y(1 - 0.6) = 510 - 60$$

$$Y = 1,125 \text{ which is the new equilibrium output when G increases to 200}$$

$$\text{Now, increase in G} = dG = 200 - 150 = 50$$

$$\text{Increase in Output } Y = dY = 1,125 - 1,000 = 125$$

$$\text{Government expenditure multiplier} = \frac{dY}{dG} = \frac{125}{50} = 2.5$$

Hence with an increase in government expenditure, real output increases. Output increases by 2.5 times of increase in government expenditure.

c) When T falls to 50

At equilibrium, Output = Expenditure

$$\text{i.e. } Y = C + I + G$$

$$\text{or, } Y = 160 + 0.6(Y - 50) + 150 + 100$$

$$\text{or, } Y(1 - 0.6) = 460 - 30$$

$$\text{or, } Y = 1,075 \text{ which is the new equilibrium output when T falls to 50}$$

$$\text{Now, decrease in T} = dT = 100 - 50 = 50$$

$$\text{Increase in output } Y = dY = 1,075 - 1,000 = 75$$

$$\text{Tax multiplier} = \frac{dY}{dT} = \frac{75}{50} = 1.5$$

Hence with a decrease in tax, real output increases. Real output increases by 1.5 times of decrease in tax.

PROBLEM NO: 9

Given:

$$\text{Consumption function (C)} = 300 + 0.75Y$$

$$\text{Investment (I)} = \text{Rs.}800;$$

$$\text{Net Imports (M - X)} = \text{Rs.}100$$

$$\text{(or) Net exports (X - M)} = \text{Rs. } (100)$$

In a four-sector model equilibrium level of output (Y):

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

$$Y = (300 + 0.75Y) + (800) + (0) + (100)$$

$$Y - 0.75Y = 1,000$$

$$0.25Y = 1,000$$

$$Y = \text{Rs.}4000$$

PROBLEM NO: 10

Investment (Rs.)	Income (Rs.)
10,000	80,000
14,000	92,000

$$\text{Change in Investment } (\Delta I) = 14,000 - 10,000 = \text{Rs.}4,000$$

$$\text{Change in National income } (\Delta Y) = 92,000 - 80,000 = \text{Rs.}12,000$$

$$\text{Investment Multiplier (k)} = \Delta Y / \Delta I = 12,000 / 4,000 = 3$$

Inference: For every Rupee increase in investment, national income increases by 3 times and hence injection into economy occurs.

THE END