Multiplier Analysis

Keynes considers his multiplier theory as an integral part of his theory of employment. According to Keynes, the multiplier establishes a precise relationship between aggregate employment and income and the rate of investment, given the propensity to consume. It tells us when there is an increment of investment, income will increase by an amount which is k times the increment of investment: ie

$$\Delta Y = k \Delta I$$

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

where Y is income
I is investment
k is multiplier

The value of the multiplier is determined by the marginal propensity to consume (mpc). The higher the mpc, the higher is the value of the multiplier and vice versa.

The relationship between multiplier and mpc can be shown as follows:

We know,

$$Y = C + I$$

$$\text{or } \Delta Y = \Delta C + \Delta I$$

$$= c\Delta Y + \Delta I \quad , c \text{ is mpc}$$

$$\text{or, } \Delta Y - c\Delta Y = \Delta I$$

$$\text{or, } \Delta Y (1-c) = \Delta I$$

$$\text{or, } \frac{\Delta Y}{\Delta I} = \frac{1}{1-c}$$

$$\text{or, } K = \frac{1}{1-c} = \frac{1}{1-mpc}$$

The multiplier also can be derived from the marginal propensity to save (mps) and it is, $K = \frac{1}{mps}$. (Since, $1-mpc = mps$)

The size of multiplier varies directly with mpc and inversely with mps. Since, $0 < mpc < 1$, multiplier, $1 < K < \infty$.

When $mpc = 0$, it means whole increment in income is saved and nothing is spent, and the value of multiplier will be one. When $mpc = 1$, the entire increment in income is spent on consumption, k will be infinite. It will soon lead to full employment in the economy and then create a limitless inflationary spiral. But these are rare phenomena. Therefore, the multiplier co-efficient varies between one and infinity.

Suppose that in an economy mpc is $\frac{1}{2}$ i.e 0.5 and investment is raised by Rs 100 crores.

Then, $K = \frac{1}{1-mpc} = \frac{1}{1-.5} = \frac{1}{.5} = \frac{10}{5} = 2$

Therefore, final increase in income will be

$$\Delta Y = K \Delta I$$
$$= 2 \times 100$$
$$= 200 \text{ crores.}$$

The process is like this — when Rs 100 crores is invested, this will immediately lead to a rise in production and income by Rs 100 crores. Since mpc is 0.5, half of the new income will be immediately spent on consumption goods which will lead to increase in production and income by the same amount, and so on. The process of income generation sets on and continues till the total income generated from Rs 100 of investment rises to Rs 200 crores.

The process of income propagation via multiplier is shown diagrammatically in fig 1.

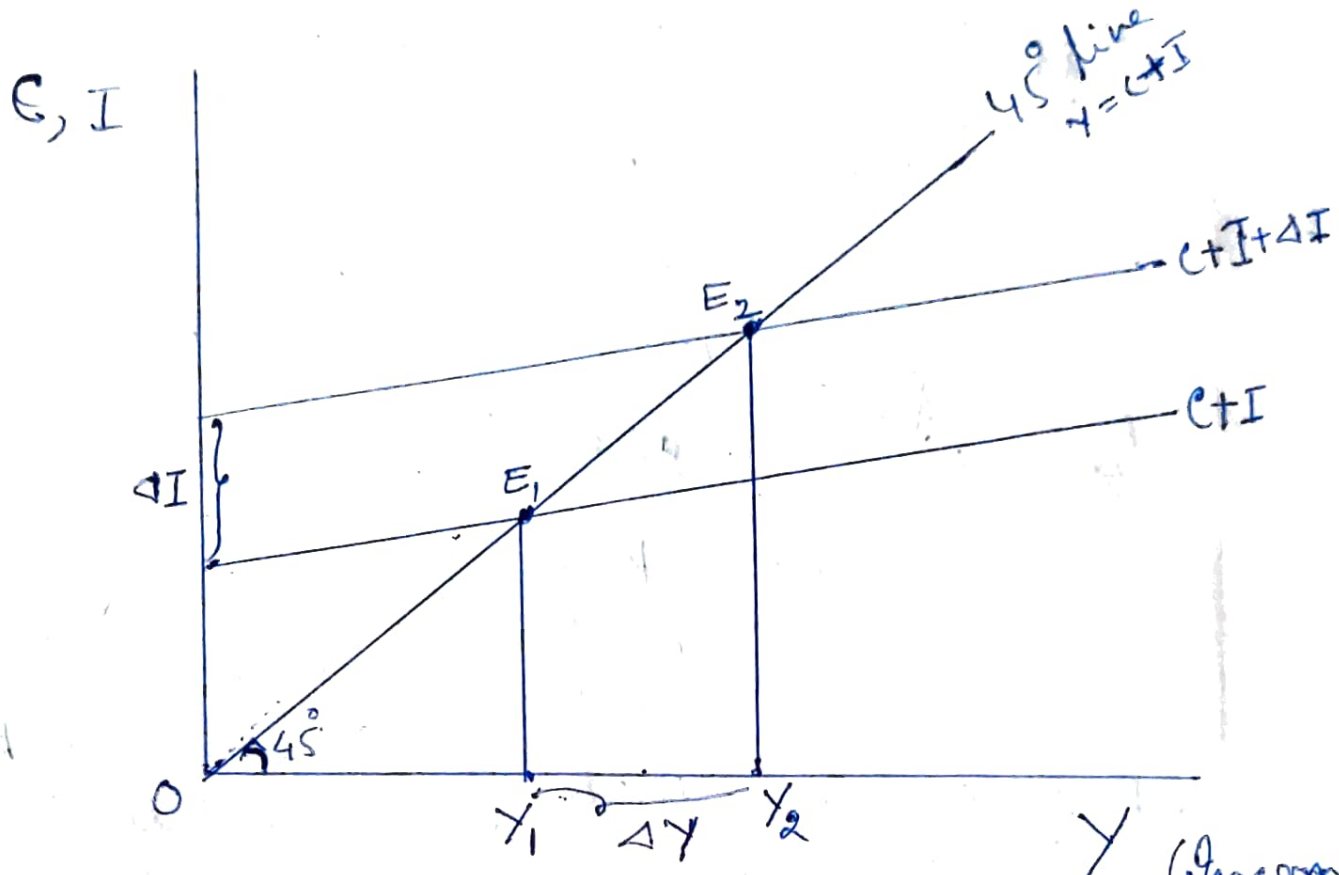

fig ①

In the figure, C+I is the aggregate demand curve (AD curve) which intersects the 45° line at E_1 so that old equilibrium level of income is OY_1. Now there is an increase in investment of ΔI. The new AD curve is $C+I+\Delta I$, which intersects the 45° line at E_2. Therefore OY_2 is the new eqm level of income. Thus the rise in income Y_1Y_2 as shown by ΔY is greater than ΔI by multiplier times.

Assumptions of multiplier:

Keynes's theory of the multiplier works under certain assumptions which limit the operation of the multiplier. They are as follows:

1. There is change in autonomous investment and that induced investment is absent.
2. The marginal propensity to consume is constant.
3. Consumption is a function of current income.
4. There is no time-lags in multiplier process. An increase in investment instantaneously leads to a multiple increase in income and vice versa.
5. There is net increase in investment.
6. Consumer goods are available in response to effective demand for them.
7. There is surplus capacity in consumer goods industries to meet the increased demand.
8. Other resources of production are also easily

availalele within the economy.

9. There is an industrialised economy in which the multiplier process operates.

10. There is a closed economy unaffected by foreign influences.

11. There are no changes in prices.

12. The accelerator effect of consumption on investment is ignored.

13. There is less than full employment level in the economy.