

## Multiplier Analysis

The concept of 'Multiplier' occupies an important place in Keynesian theory of income, output and employment. It is an important tool of income propagation and business cycle analysis.

According to Keynes, employment depends upon effective demand, which in turn, depends upon consumption and investment ( $Y = C + I$ ). Consumption function, as we have known, is stable in the short-run and MPC is less than unity.

Therefore, all the increases in income do not go to increase consumption to the extent of increment in income, with the result, that a gap comes to exist between the incomes (output) produced and consumed which must be made up by investment. Keynes believed that the initial increment in investment increases the final income by many times. Keynes gave the name of 'Investment Multiplier', also called 'Income Multiplier' by others.

**Multiplier** is the ratio of change in national income due to change in investment.

The term multiplier has been borrowed from mathematics. It is used for that number which is multiplied by another number. For example, if an investment of Rs 1000 in a business yields an income of Rs 2000 ( $1000 \times 2$ ), then multiplier is 2.

It shows that with an increase in investment, there is initially an increase in consumption & finally many more times more increase in income. The reason is that the initial investment increases the income not only in those industries where the investment is made but also in certain other industries whose products are demanded by people employed in investment industries.

Thus, increase in investment does not cause increase in income in the same proportion; rather ultimate increase in income is many more times more than initial increase in investment. For example: If initial investment increases by 10 crores and the aggregate income rises by 30 crores, then the multiplier is 3. In its essence, the Multiplier is the ratio of the change in Income to the change in Investment.

Multiplier (K) = Change in investment/Change in income =  $\Delta Y / \Delta I$

### Relation between Multiplier & Marginal propensity to consume (MPC)

The value of Multiplier is directly related to value of MPC.

If the MPC is higher, then value of the multiplier will also be higher and vice-versa.

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

We know that  $Y = C + I$  OR  $\Delta Y = \Delta C + \Delta I$

$$K = \frac{\Delta Y}{\Delta Y - \Delta C}$$

(Dividing by  $\Delta Y$ )

$$K = \frac{\frac{\Delta Y}{\Delta Y}}{\frac{\Delta Y}{\Delta Y} - \frac{\Delta C}{\Delta Y}}$$

Or

$$K = \frac{1}{1 - \frac{\Delta C}{\Delta Y}}$$

Or

$$K = \frac{1}{1 - MPC} \left( MPC = \frac{\Delta C}{\Delta Y} \right)$$

Or

$$K = \frac{1}{1 - MPC} = \frac{1}{MPS} \quad (MPS = 1 - MPC)$$

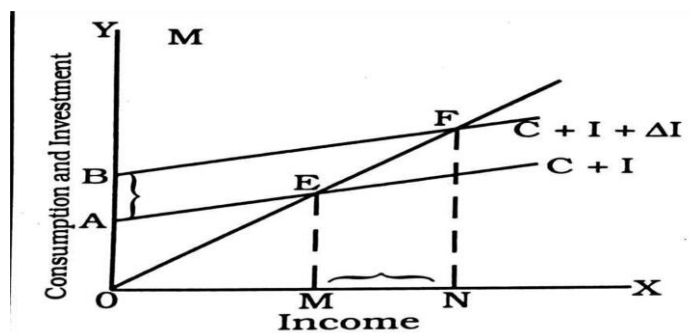
(Here; K = Investment multiplier; MPC = Marginal propensity to consume; MPS = Marginal propensity to save)

For example,  $MPC = \frac{3}{4}$  then  $K = \frac{1}{1 - \frac{3}{4}} = \frac{1}{\frac{1}{4}} = 4$ .

OR;  $MPS = \frac{1}{10}$ ;  $K = \frac{1}{MPS} = \frac{1}{\frac{1}{10}} = 10$

Thus, we can say that;

- There is direct relation between MPC and multiplier.
- There is inverse relation between MPS and multiplier.



- In the above diagram, the original equilibrium level of income is OM at point E. Now, if investment is increased by AB, the new curve will be  $C+I+\Delta I$ .
- As a result of this increase in investment, income increases by MN. This is due to multiplier effect.
- In the words of **J. Breadshow**, “The multiplier principle is that a change in the level of injection bring about a relatively greater change in the level of national income.”

### **Characteristics of Multiplier**

- Aggregate demand (Investment & consumption), cause the multiplier effect.
- Multiplier work in both the directions i.e. forward & backward. A slight increase in investment leads to multiple increases in income & a slight decrease in investment leads to multiple decrease in income due to backward action of multiplier.
- Size of multiplier depends upon MPC. Higher MPC, greater will be the size of multiplier.
- There is inverse relationship between marginal propensity to save (MPS) & size of multiplier.
- Size of multiplier is reduced proportionate to the leakages (savings) of the current income flow.

### **Assumption of the concept of Multiplier**

Principle of multiplier is based on the following assumptions:

- 1) There should be continuity in investment.
- 2) Availability of consumer goods.
- 3) Steady flow of investment.
- 4) Steady flow of consumption goods.
- 5) Non existence of international trade with the rest of the world (Closed economy).
- 6) No time lag between the income receipt and consumption expenditure made by the community (Multiplier period).
- 7) Industrialized economy (multiplier is more effective in industrialized economy as compared to agricultural economy).
- 8) No change in prices (there should be no change in prices of goods. If prices rise, effect of multiplier will diminish).
- 9) The economy operates at the situation less than full employment.

## Leakages of Multiplier

Income that is not spent for currently produced consumption goods & services may be regarded as having leaked out of income stream. The more powerful these leakages are, smaller will be the value of multiplier.

- **Saving:** If the people will save whole of their increased income, then there cannot be investment multiplier. Higher the MPS lower the investment multiplier.
- **Debt Repayment:** According to Duesenberry, people use their part of income for the payment of the past debts that they have incurred. Because of this, there is leakage from the income stream and the value of multiplier gets reduced.
- **Accumulation of idle cash balance:** the part of increased income saved by the people in banks (idle cash) will not be the part of money in circulation and therefore the value of multiplier will come down.
- **Purchase of shares & government securities:** The income spent for purchasing of old stock, securities and bonds by the people will not form the part of consumption expenditure, therefore such transactions are unlikely to increase the value of multiplier.
- **Imports:** Money spent in buying imported goods does not add to domestic income and employment. Because of this money leaks out of the country. This limits the value of multiplier.
- **Price inflation:** During inflation, money income of the community increases but real income decreases. The real consumption expenditure which determines the value of the multiplier will fall. The major part of increase in money income will be neutralized by price inflation instead of stimulating consumption, income and employment.
- **Taxation system:** If government takes away the newly generated income in the form of taxes, the value of multiplier will fall.
- **Undistributed profits of the companies:** The part of net profit not distributed as dividends and retained by the business for expansion, is also a leakage of multiplier.
- **Liquidity preference**

## Working of the multiplier

- Suppose an economy is in equilibrium and autonomous business investment increases by Rs 100 million.

- Due to this effect the total output increases by Rs 100 million. Further it also means an additional income of Rs 100 million has been generated in the form of wages, interest and profits. This makes the first round of income generation.
- Assuming  $MPC = 0.8$ ; total expenditure on consumer goods =  $(100 \text{ million}) \times (0.8) = \text{Rs } 80$  million. This expenditure generates income worth Rs 80 million in second round.

Rounds	Consumer Spending	Income generation
First	--	100
Second	80	80
Third	64	64
Fourth	51.2	51.2
Fifth	40.96	40.96
.....		
Last Round		0
<b>Total Income</b>		500

### Importance of multiplier

- **Income propagation:** Concept of multiplier tells that income propagation is a natural process.
- **Importance of investment**
- **Full employment:** In formulating policy regarding full employment, concept of multiplier can prove to be of great importance. As a result of increase in investment, income will increase manifold, consequently both output & employment will improve.
- **Equilibrium between Saving and Investment** can be established from the co-efficient of multiplier.
- **Deficit financing:** Deficit financing can be of great help in removing the bad effects of depression. As a result of deficit financing, investment increases & increase in investment causes multiple increases in income.
- **Public investment:** Keynes has underlined the significance of public investment; which will lead to multiple increases in income, which will help control depression & unemployment.