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Calculating the Size or Value of Multiplier

It follows from above that the size or value of multiplier is the reciprocal of marginal propensity to save. Therefore, we can obtain the value of multiplier if we know the marginal propensity to consume or the marginal propensity to save of the community. Given the size of multiplier from the net increase in investment, we can find out the total increment in income that will occur as a result of investment.

If the marginal propensity to consume of a community is equal to $\frac{2}{3}$, we can find out the size of multiplier as under:

Multiplier, $k = \frac{1}{1-MPC}$

$$\frac{1}{1-\frac{2}{3}} = \frac{1}{\frac{1}{3}} = 3$$

Likewise, if the marginal propensity to consume is equal to $\frac{1}{2}$ or 0.5, then the multiplier:

$$1/1-1/2 = 1/1/2 = 2$$

Two Limiting Cases of the Value of Multiplier:

There are two limiting cases of the multiplier. One limiting case occurs when the marginal propensity to consume is equal to one, that is, when the whole of the increment in income is consumed and nothing is saved. In this case, the size of multiplier will be equal to infinity, that is, a small increase in investment will bring about a very large increase in income and employment so that full employment is reached and even the process goes beyond that. “In such circumstances, the Government would need to employ only one road builder to raise income indefinitely, causing first full employment and then a limitless spiral of inflation.”

However, this is unlikely to occur since marginal propensity to consume in the real world is less than one. The other limiting case occurs when marginal propensity to consume is equal to zero, that is, when nothing out of the increment in income is consumed, and the whole increment in income is saved.

In this case, the value of the multiplier will be equal to one. That is, in this case, the increment in income will be equal to the original increase in investment and not a multiple of it. But in actual practice the marginal propensity to consume is less than one but more than zero ($1 > \Delta C/\Delta Y > 0$). Therefore, the value of the multiplier is greater than one but less than infinity.

Assumptions of Multiplier Theory

In our above explanation of multiplier, we have made many simplifying assumptions. First, we have assumed that the marginal propensity to consume remains constant throughout as the income increases in various rounds of consumption expenditure. However, the marginal propensity to consume may differ in various rounds of consumption expenditure.

But this constancy of marginal propensity to consume is a realistic assumption, since all available empirical evidence shows that marginal propensity to consume is very stable in the short run. Secondly, we have assumed that there is a net increase in investment in a period and no further indirect effects on investment in that period occur or if they occur they have been taken into account so that there is a given net increase in investment.

Further, we have assumed that there is no any time-lag between the increase in investment and the resultant increment in income. That is, increment in income takes place instantaneously as a result of increment in investment. J.M. Keynes ignored the time-lag in the process of income generation and therefore his multiplier is also called instantaneous multiplier. In recent years, the importance of time lag has been recognised and concept of dynamic multiplier has been developed on that basis. But in an elementary study as the present one the time lags will be ignored as was done by Keynes.

Another important assumption in the theory of multiplier is that excess capacity exists in the consumer goods industries so that when the demand for them increases, more amounts of consumer goods can be produced to meet this demand. If there is no excess capacity in consumer goods industries, the increase in demand as a result of some original increase in investment will bring about rise in prices rather than increases in real income, output and employment.

Keynes's multiplier was evolved in the context of advanced capitalist economies which were in grip of depression and in times of depression and there did exist excess capacity in the consumer goods industries due to lack of aggregate demand. The Keynesian multiplier effect is very small in developing countries like India since there is not much excess capacity in consumer goods industries.

In our above analysis of the multiplier process we have taken a closed economy, that is, we have not taken into account imports and exports. If ours were an open economy, then a part of the increment in consumption expenditure would have been made on imports of goods from abroad.

This would have caused increment in income in foreign countries rather than within the country. This will reduce the value of the multiplier. Imports are important leakage from the multiplier process and we have ignored them in our above analysis for the purpose of simplicity.

It is worth noting that multiplier not only works in money terms but also in real terms. In other words, multiple increments in income as a result of a given net increase in investment does not only take place in money terms but also in terms of real output, that is, in terms of goods and services. When incomes increase as a result of investment and these increments in income are spent on consumer goods, the output of consumer goods is increased to meet the extra demand brought about by increased incomes.

Therefore, real income or output, increases by the same amount as the increment in money incomes, since the prices of goods have been assumed to be constant. Of course, we have assumed, as has been mentioned above, that there exists

excess productive capacity in the consumer goods industries so that when the demand for consumer goods increases, their production can be easily increased to meet this demand. However, if due to some bottlenecks output of goods cannot be increased in response to increasing demand, prices will rise and as result the real multiplier effect will be small.

Diagrammatic Representation of Multiplier

We have already explained that the level of national income is determined by the equilibrium between aggregate demand and aggregate supply. In other words, the level of national income is fixed at the level where $C + I$ curve intersects the 45° income curve. With such a diagram we can explain the multiplier. The multiplier is illustrated in Fig. 9.1. In this figure C represents marginal propensity to consume. Marginal propensity to consume has been here assumed to be equal to $1/2$ i.e., 0.5 . Therefore, the slope

of the curve C of marginal propensity to consume curve C has been taken to be equal to 0.5 . $C + I$ represents aggregate demand curve. It will be seen from Fig. 91 that the aggregate demand curve $C + I$ which intersects the 45° line at point E so that the level of income equal to OY_1 is determined.

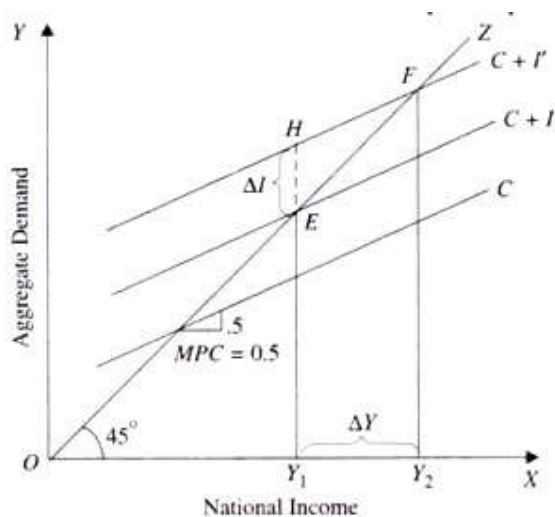


Fig. 9.1. Keynes's Income Multiplier.

If investment increases by the amount EH we can then find out how much increment in income will occur as a result of this. As a consequence of increase in investment by EH , the aggregate demand curve shifts upward to the new position $C + I'$. This new aggregate demand curve $C + I'$ intersects the 45° income line at point F so that the equilibrium level of income increases to OY_2 .

Hence as a result of net increase in investment equal to EH , the income has increased by Y_1Y_2 . It will be seen from the figure that Y_1Y_2 is greater than EH . On measuring, it will be found that Y_1Y_2 is twice the length of EH . This is as it is expected because the marginal propensity to consume is here equal to $1/2$ and therefore the size of multiplier will be equal to 2.

The multiplier can be illustrated through saving-investment diagram also. In a previous chapter we explained the determination of national income also through saving the investment. Therefore, the multiplier can also be explained with the help of saving- investment diagram, as has been shown in Fig. 9.2. In this figure SS is the saving curve indicating that as the level of income increases, the community plans to save more. II is the investment curve showing the level of investment planned to be undertaken by the investors in the community.

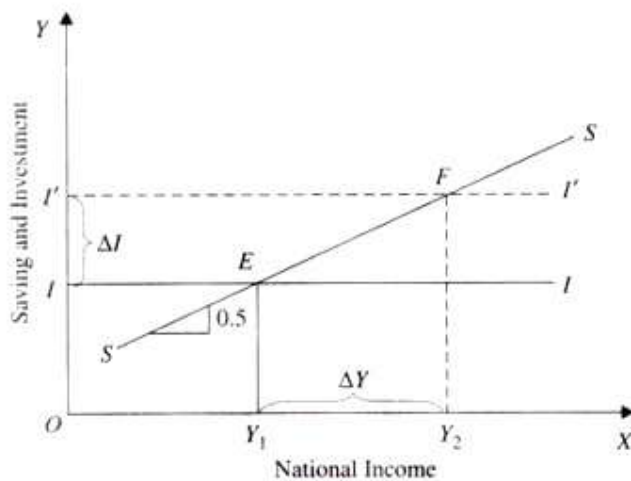


Fig. 9.2. Multiplier Explained with the Aid of Savings-Investment Diagram

The investment has been taken to be a constant amount and autonomous of changes in income. This investment level OI has been determined by marginal efficiency of capital and the rate of interest. Investment being autonomous of income means that it does not change with the level of income.

Keynes treated investment as autonomous of income and we will here follow him. It will be seen from Fig. 9.2 that saving and investment curves intersect at point E , that is, planned saving and planned investment are in equilibrium at the level of income OY_1 .

Thus, with the given saving and investment curves level of income equal to OY_1 is determined. Now suppose that there is an increase in investment by the amount II' . With this increase in investment, the investment curve shifts to the new dotted position $I'I'$.

This new investment curves I'I' intersects the saving curve at point F and a new equilibrium as reached at the level of income OY₂. A glance at the Fig. 9.2 will reveal that the increase in income Y₁ Y₂ is twice the increase in investment by II'. Thus multiplier is here equal to [K=1/0.5=2].

Money Supply Reserve Multiplier

Most economists view the money multiplier in terms of reserve dollars and that is what the money multiplier formula is based on. Theoretically, this leads to a money (supply) reserve multiplier formula of:

$$\text{MSRM} = \frac{1}{\text{RRR}}$$

where:

MSRM = Money supply reserve multiplier

RRR = Reserve requirement ratio

For example, in the case of banks with the highest required reserve requirement ratio—10% prior to COVID-19—their money supply reserve multiplier would be 10 (1 / 0.10). This means every one dollar of reserves should have \$10 in money supply deposits.

If the reserve requirement is 10%, then the money supply reserve multiplier is 10 and the money supply should be 10 times reserves. When a reserve requirement is 10%, this also means that a bank can lend 90% of its deposits.