## **MULTIPLIER**

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## The term multiplier refers to the ratio between changes in dependent variable with respect to the changes in the independent variable. In macroeconomics the term has been used by J.M. Keynes and R. F. Khan to explain investment multiplier and employment multiplier respectively. Keynes developed the investment multiplier in 1929 while Khan developed it in 1931. In macroeconomics Keynesian investment multiplier has been discussed widely which is explained below.

## Investment (I) and income(Y) are positively related. According to Keynes as investment increases or decreases, income increases or decreases; but the increase or decrease in income is more than the increase or decrease in investment. Thus investment multiplier is defined as the ratio between the changes in income with respect to the change in investment. It is denoted by “K”. Algebraically-

##  K= $\frac{∆Y}{∆I}$ ………….(i)

##  Where,

## ΔY = Increase in GDP/GNP/ National Income

## ΔI = Increase in Investment

## From equation (i) the effect on Y can be calculated as follows-

## ΔY = K x ΔI…………..(ii)

## Investment multiplier is positively related to marginal propensity to consume (MPC) and inversely related to marginal propensity to save (mps). The relationship between them is derived below-

##  Y= C+ I ………………….(iii)

## If there is change in C and I, Y will also change as given under

##  ΔY = ΔC + Δ I……………..(iv)

## If both sides of equation (iv) is divided by …………(v) we get- j∆

##  $\frac{∆Y}{∆Y}$ = $\frac{∆C}{∆Y}$ + $\frac{∆I}{∆Y}$

##  =>1= MPC + $\frac{1}{K}$

##  =>1- MPC= $\frac{1}{K}$

##  =>K = $\frac{1}{1-MPC}$…………(vi)

## Since MPC+ MPS = 1

## Therefore, K= $\frac{1}{MPS}$ ……………(vii)

## Size of multiplier: When MPS=1, K=1 and when MPC= 0, MPC= ∞ (infinity). Thus minimum value of multiplier is 1 and maximum value of multiplier is ∞. Symbolically, 1≤ K≤ ∞.

## Working of multiplier: There is both forward and backward working of multiplier. Forward working of multiplier refers the situation when income increases as investment increases and backward working of multiplier refers the situation when income decreases with the decrease in investment. The working of multiplier depends on the following assumptions –

## Assumptions of multiplier-

## Marginal propensity to consume remains constant throughout the adjustment process.

## There is no induced investment.

## The economy is closed.

## Consumption is the function of current income.

## The output of consumer goods is responsive to effective demand.

## There is surplus capacity in consumer goods industries.

## There is no time lag.

## There is no change in prices of commodity and raw materials.

## Less than full employment situation prevails in the economy.

## Multiplier process operates in the industrialized economy.

## Forward working of multiplier:

## Multiplier operates in forward direction when there is multiple increases in income as a result of increase in investment. For example, if increase in investment of Rs.50 crore causes an increase in income by Rs.200 crore; this is forward working of multiplier. It is explained graphically as follows-

### Consumption /Investment

C+I2

AS=C+S

E2

I2

C+I1

C

E1

I1

Y2

Y1

### Income

O

## AS curve is represented by the 450 line. Throughout the line the planned expenditure is equal to planned output. It also represents the level of output where aggregate demand is equal to aggregate supply.

### C is the consumption curve. It denotes C= a + by. Here “a’ is the autonomous consumption and ‘b’ is the marginal propensity to consume and ‘Y’ is the income. C+I1 is the aggregate demand curve. (The difference between C+I1  and C is the autonomous investment. ) C+I1 intersects the aggregate supply curve Y=C+S at E1 and OY1 level of income is determined.

### Now if the aggregate demand curve shifts to C+I2 due to increase in autonomous investment, the income will increase to OY2. It is seen that increase in income Y1Y2 is more than the increase in investment I1I2.  This is the forward working of multiplier.

## **Backward working of multiplier:**

## When investment decreases, income also decreases. This is the backward working of multiplier. In the figure if aggregate demand function shifts from C+I2 to C+I1 due to decrease in investment, income will fall from OY2 to OY1.

## Leakages of Multiplier.

## Leakages of multiplier refer to the factors for which the process of income propagation is slowed down. They include the following-

## Saving:

##  If MPC is more there will be more saving. It leads to decrease in the value of multiplier and thus generation of income will be less.

## Debt Cancellation

## If increase in income is used for repayment of debt rather than used for consumption, it will be leakage for income generation.

## Imports

## If imports exceed exports, investment will flow out to foreign countries and income in the domestic country will not generated as desired.

## Price inflation

## When there is a rise in prices of consumption goods, a major part of the increased income is dissipated on higher prices, instead of promoting consumption, income and employment.

## Hoarding

## If people hoard more out of increased income it will remain idle cash balances. This is another leakage which restricts the value of multiplier.

## Purchase of old shares and securities

## If newly earned income is spent on purchasing old shares and securities, it will reduce consumption and restrict the value of multiplier.

## Taxation

## Taxes reduce the disposable income and thereby discourage consumption expenditure which in turn lower the size of multiplier.

## Undistributed profit

## If a part of the profit of companies are not distributed among shareholders, it forms a leakage in the multiplier process.

## Limitation/ Criticisms of Multiplier

## Unrealistic assumption

##  Closed economy, constant MPC, autonomous investment etc. are the unrealistic assumption of the Keynesian investment multiplier.

## Mere tautology (logically true only)

## Investment multiplier is mere a arithmetic multiplier, it does not reflect the true behaviour of the relationship among the variables.

## Neglect time lags

## Keynes concept of multiplier is timeless. In reality, a time lag exists between the receipts of income and its expenditure.

## Saving is not always hoarding

## All savings are not hoarding, and thus are not vice. In several cases accumulated savings are used for investments.