UNIT-IV

WHAT IS A MULTIPLIER?

In economics, a multiplier broadly refers to an economic factor that, when increased or changed, causes increases or changes in many other related economic variables. In terms of gross domestic product, the multiplier effect causes gains in total output to be greater than the change in spending that caused it.

The term multiplier is usually used in reference to the relationship between government spending and total national income. Multipliers are also used in explaining fractional reserve banking, known as the deposit multiplier.

KEY TAKEAWAYS

- A multiplier refers to an economic factor that, when applied, amplifies the effect of some other outcome.
- A multiplier value of 2x would therefore have the result of doubling some effect; 3x would triple it.
- Many examples of multipliers exist, such as the use of margin in trading or the money multiplier in fractional reserve banking.

What's a Multiplier?

Explaining Multipliers
A multiplier is simply a factor that amplifies or increase the base value of something else. A multiplier of 2x, for instance, would double the base figure. A multiplier of 0.5x, on the other hand, would actually reduce the base figure by half. Many different multipliers exist in finance and economics.

The Fiscal Multiplier
The fiscal multiplier is the ratio of a country's additional national income to the initial boost in spending or reduction in taxes that led to that extra income. For example, say that a national government enacts a $1 billion fiscal stimulus and that its consumers' marginal propensity to consume (MPC) is 0.75. Consumers who receive the initial $1 billion will save $250 million and spend $750 million, effectively initiating another, smaller round of stimulus. The recipients of that $750 million will spend $562.5 million, and so on.

The Investment Multiplier
An investment multiplier similarly refers to the concept that any increase in public or private investment has a more than proportionate positive impact on aggregate income and the general economy. The multiplier attempts to quantify the additional effects of a policy beyond those immediately measurable. The larger an investment's multiplier, the more efficient it is at creating and distributing wealth throughout an economy.

The Earnings Multiplier

The earnings multiplier frames a company's current stock price in terms of the company's earnings per share (EPS) of stock. It presents the stock's market value as a function of the company's earnings and is computed as (price per share/earnings per share).

This is also known as the price-to-earnings (P/E) ratio. It can be used as a simplified valuation tool for comparing relative costliness of the stocks of similar companies, and for judging current stock prices against their historical prices on an earnings relative basis.

The Equity Multiplier

The equity multiplier is a commonly used financial ratio calculated by dividing a company's total asset value by total net equity. It is a measure of financial leverage. Companies finance their operations with equity or debt, so a higher equity multiplier indicates that a larger portion of asset financing is attributed to debt. The equity multiplier is thus a variation of the debt ratio, in which the definition of debt financing includes all liabilities.

Multiplying Money

One popular multiplier theory and its equations were created by British economist John Maynard Keynes. Keynes believed that any injection of government spending created a proportional increase in overall income for the population, since the extra spending would carry through the economy. In his 1936 book, "The General Theory of Employment, Interest, and Money," Keynes wrote the following equation to describe the relationship between income (Y), consumption (C) and investment (I):

The equation states that for any level of income, people spend a fraction and save/invest the remainder. He further defined the marginal propensity to save and the marginal propensity to consume (MPC), using these theories to determine the amount of a given income that is invested. Keynes also showed that any amount used for investment would be reinvested many times over by different members of society. For example, assume a saver invests $100,000 in a savings account at his bank.

Because the bank is only required to maintain a portion of that money on hand to cover deposits, it can loan out the remainder of the deposit to another party. Assume the bank loans out $75,000 of the initial deposit to a small construction company, who uses it to build a warehouse. The funds spent by the construction company go to pay electricians, plumbers, roofers, and various other parties to build it.

These parties then go on to spend the funds they receive according to their own interests. The $100,000 has earned a return for the investor, the bank, the construction company and the contractors that built the warehouse. Since Keynes' theory showed that investment was multiplied, increasing incomes for many parties, Keynes coined the term "multiplier" to describe the effect.

The deposit multiplier is frequently confused, or thought to be synonymous, with the money multiplier. However, although the two terms are closely related, they are not interchangeable. If banks loaned out all available capital beyond their required reserves, and if borrowers spent every dollar borrowed from banks, then the deposit multiplier and the money multiplier would be essentially the same.

In actual practice, the money multiplier, which designates the actual multiplied change in a nation's money supply created by loan capital beyond bank's reserves, is always less than the deposit multiplier, which can be seen as the maximum potential money creation through the multiplied effect of bank lending.

STATIC DYNAMIC MULTIPLIER

Depending on the purpose of analysis sometimes a distinction is made between the static multiplier and the dynamic multiplier. The static multiplier is also called comparative static multiple simultaneous multiplier, logical multiplier, timeless multiplier, legless multiplier and instant multiplier

The concept of static multiplier implies that changes in investment causes change in income instantaneously. It means that there is no time lag between the change in investment and the change in income. It implies that the moment a rupee is spent on investment project, society's income increases by a multiple. Let us explain the concept of the dynamic multiplier also known as period and sequence multiplier.

The concept of dynamic multiplier recognizes the fact that the overall change in income as a result of the change in investment is not instantaneous. There is a gradual process by which income change as a result of change in investment or other determinants of income. The process of change in income involves a time lag. The multiplier process works through the process of income generation and consumption expenditure. The dynamic multiplier takes into account the dynamic process of the change in income and the change in consumption at different stages due to change in investment. The dynamic multiplier is essentially a stage-by stage computation of the change in income resulting from the change in investment till the full effect of the multiplier is realized.

FOREIGN TRADE MULTIPLIER: MEANING, WORKING, ASSUMPTION, EXPLANATION, EFFECTS AND CRITICISMS!

Meaning:

The foreign trade multiplier, also known as the export multiplier, operates like the investment multiplier of Keynes. It may be defined as the amount by which the national income of a country will be raised by a unit increase in domestic investment on exports.

As exports increase, there is an increase in the income of all persons associated with export industries. These, in turn, create demand for goods. But this is dependent upon their marginal propensity to save (MPS) and the marginal propensity to import (MPM). The smaller these two marginal propensities are, the larger will be the value of the multiplier, and vice versa.

It's working:

The foreign trade multiplier process can be explained like this. Suppose the exports of the country increase. To begin with, the exporters will sell their products to foreign countries and receive more income. In order to meet the foreign demand, they will engage more factors of production to produce more.

This will raise the income of the owners of factors of production. This process will continue and the national income increases by the value of the multiplier. The value of the multiplier depends on the value of MPS and MPM, there being an inverse relation between the two propensities and the export multiplier.

The foreign trade multiplier can be derived algebraically as follows:

The national income identity in an open economy is

$$Y = C + I + X - M$$

Where Y is national income, C is national consumption, I is total investment, X is exports and M is imports.

The above relationship can be solved as:

$Y-C = 1 + X-M$

or $S = I+X-M$ $(S=Y-C)$

$S + M = I + X$

Thus at equilibrium levels of income the sum of savings and imports (S+M) must equal the sum of investment and export (1+X).

In an open economy the investment component (I) is divided into domestic investment (I_d) and foreign investment (I_f)

$I=S$

$I_d + I_f = S\ldots$ (1)

Foreign investment (I_f) is the difference between exports and imports of goods and services.

$I_f = X-M\ldots.$ (2)

Substituting (2) into (1), we have

$l_d + X-M – S$

or $I_d + X = S+M$

Which is the equilibrium condition of national income in an open economy. The foreign trade multiplier coefficient (K_f) is equal to

$K_f = \Delta Y/\Delta X$

And $\Delta X = \Delta S + \Delta M$

Dividing both sides by ΔY, we get

$$\frac{\Delta X}{\Delta Y} = \frac{\Delta S + \Delta M}{\Delta Y}$$

or $$\frac{\Delta Y}{\Delta X} = \frac{\Delta Y}{\Delta S + \Delta M}$$

or $$K_f = \frac{\Delta Y}{\Delta S + \Delta M} \qquad \left(\because K_f = \frac{\Delta Y}{\Delta X}\right)$$

$$K_f = \frac{1}{\frac{\Delta S}{\Delta Y} + \frac{\Delta M}{\Delta Y}} \qquad (\because \text{Dividing by } \Delta Y)$$

Hence $$K_f = \frac{1}{MPS + MPM} \qquad \left(\begin{matrix}\because MPS = \Delta S / \Delta Y \\ \because MPM = \Delta M / \Delta Y\end{matrix}\right)$$

Let us understand it with the help of an example.

Suppose MPS=0.3, MPM = 0.2 and ΔX (increase in exports) = Rs. 1000 crores, we get

$$K_f = \frac{\Delta Y}{\Delta X} = \frac{1}{MPS + MPM}$$

or $$\Delta Y = \frac{1}{MPS + MPM} \Delta X$$

$$= \frac{1}{0.3 + 0.2} \times 1000 = \text{Rs. } 2000 \text{ crores}$$

It shows that an increase in exports by Rs. 1000 crores has raised national income through the foreign trade multiplier by Rs. 2000 crores, given the values of MPS and MPM.

It's Assumptions:

The foreign trade multiplier is based on the following assumptions:

1. There is full employment in the domestic economy.

2. There is direct link between domestic and foreign country in exporting and importing goods.

3. The country is small with no foreign repercussion effects.

4. It is on a fixed exchange rate system.

5. The multiplier is based on instantaneous process without time lags.

6. There is no accelerator.

7. There are no tariff barriers and exchange controls.

8. Domestic investment (I_d) remains constant.

9. Government expenditure is constant.

10. The analysis is applicable to only two countries.

Diagrammatic Explanation:

Given these assumptions, the equilibrium level in the economy is shown in Figure 1, where S(Y) is the saving function and (S+M) Y is the saving plus import function. l_d represents domestic investment and l_d + X, domestic investment plus exports. (S+M) Y and I_d+ X functions determine the equilibrium level of national income OY at point E, where savings equal domestic investment and exports equal imports.

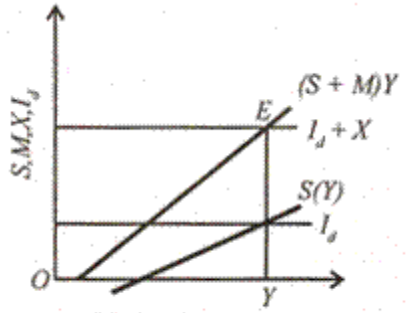

Fig. 1

If there is a shift in the I_d + X function due to an increase in exports, the national income will increase from OY to OY_1 as shown in Figure 2. This increase in income is due to the multiplier effect, i.e. $\Delta Y = K_f \Delta X$. The exports will exceed imports by sd, the amount by which savings will exceed domestic investment. The new equilibrium level of income will be OY_1. It is a case of positive foreign investment.

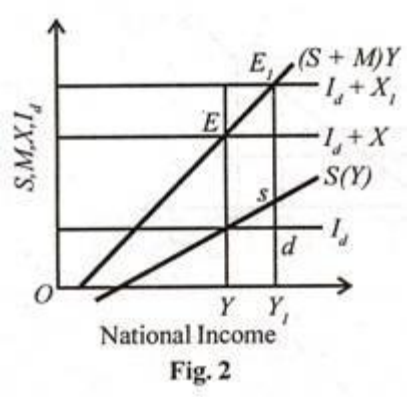

Fig. 2

If there is a fall in exports, the export function will shift downward to $I_d + X_1$ as shown in Figure 3. In this case imports would exceed exports and domestic investment would exceed savings by ds. The level of national income is reduced from OY to OY_1. This is the reverse operation of the foreign trade multiplier.

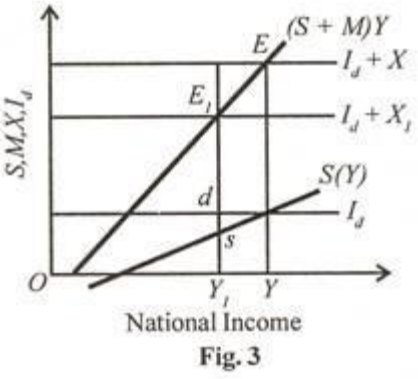

Fig. 3

Criticisms of Foreign Trade Multiplier:

The two models of the foreign trade multiplier presented above are based on certain assumptions which make the analysis unrealistic.

1. Exports and Investment not Independent:

The analysis of simple foreign trade multiplier is based on the assumption that exports and investment (both domestic and foreign) are independent of changes in the level of national income. But, in reality, this is not so. A rise in exports does not always lead to increase in national income. On the contrary, certain imports, of say capital goods, have the effect of increasing national income.

2. Legless Analysis:

The foreign trade multiplier is assumed to be an instantaneous process whereby it provides the final results. Thus it involves no lags and is unrealistic.

3. Full Employment not Realistic:

The analysis is based on the assumption of a fully employed economy. But there is less than full employment in every economy. Thus the foreign trade multiplier does not find clear expression in an economy with less than full employment.

4. Not Applicable to More than two Countries:

The whole analysis is applicable to a two-country model. If there are more than two countries, it becomes complicated to analyse and interpret the foreign repercussions of this theory.

5. Neglects Trade Restrictions:

The foreign trade multiplier assumes that there are no tariff barriers and exchange controls. In reality, such trade restrictions exist which restrict the operations of the foreign trade multiplier.

6. Neglects Monetary-Fiscal Measures:

This analysis is based on the unrealistic assumption that the government expenditure is constant. But governments always interfere through monetary and fiscal policies which affect exports, imports and national income. Despite these shortcomings, the foreign trade multiplier is a powerful tool of economic analysis which helps in formulating policy measures.

THE SUPER-MULTIPLIER OR THE MULTIPLIER-ACCELERATOR INTERACTION:

In order to measure the total effect of initial investment on income, Hicks has combined the multiplier and the accelerator mathematically and given it the name of the super-multiplier. The

combined effect of the multiplier and the accelerator is also called the leverage effect which may lead the economy to very high or low level of income propagation.

The super-multiplier is worked out by combining both induced consumption (cY or ΔC/ΔY or MPC) and induced investment (v Y or ΔI/ ΔY or MPI). Hicks divides the investment component into autonomous investment and induced investment so that investment $I = I_d + vY$, where I_a is autonomous investment and vY is induced investment.

Since $Y = C + I$

Therefore, $\Delta Y = c\,\Delta Y + \Delta Ia + v\Delta Y$

$\Delta Y - c\Delta Y - v\Delta Y = \Delta Ia$

$\Delta Y\,(1-c-v) = \Delta Ia$

$$\frac{\Delta Y}{\Delta I_a} = \frac{1}{1-c-v} = \frac{1}{s-v}$$

or $$K_S = \frac{1}{1-c-v} = \frac{1}{s-v}$$

Where K_s is the super-multiplier, c is the marginal propensity to consume, v the marginal propensity to invest, and s is the marginal propensity to save (s=1- c).

The super-multiplier tells us that if there is an initial increase in autonomous investment, income will increase by K_s times the autonomous investment. So the super-multiplier in general form will be

$$\Delta Y = \frac{1}{1-c-v}\Delta Ia$$
$$= K_S \Delta\, Ia$$

Let us explain the combined operation of the multiplier and the accelerator in terms of the above equation. Suppose c = 0.5, v = 0.4 and autonomous investment increases by Rs. 100 crores. The increase in aggregate income will be

$$\Delta Y = \frac{1}{1-0.5-0.4} \times 100$$
$$= \frac{1}{0.1} \times 100 = 10 \times 100 = 1000$$

It shows that a rise in autonomous investment by Rs 100 crores has raised income to Rs. 1000 crores. The simple multiplier would have raised income to only Rs. 200 crores, given the value of K the multiplier as 2 (since MPC = 0.5). But the multiplier combined with the accelerator

(K_s = 10) has raised income to Rs. 1000 crores which is higher than generated by the simple multiplier.

Table II explains how the process of income propagation via the multiplier and the accelerator with the value of the super-multiplier K_s = 10 leads to a rise in income to Rs. 1000 crores with an initial investment of Rs. 100 crores.

Table II : Multiplier-Accelerator Interaction

(Rs Crores)

Period (t)	Initial Investment	Induced Comsumption (c=0.5)	Induced Investment (v=0.4)	Increase in Income (ΔY=c+v)	Total Increase in Income
(1)	(2)	(3)	(4)	(5)	(6)
t+0	0	0	0	0	0
t+1	100	—	—	100	100
t+2	100	50	40	90	190
t+3	100	45	36	81	271
t+4	100	40.5	32.4	72.9	343.9
t+5	100	36.45	29.16	65.61	409.51
....	....	....	...	...	...
t+*n*	100	0	0	0	1000

In period t+1 constant investment of 100 is injected into the economy but there is no immediate induced consumption or investment. In period t+2, induced consumption of 50 takes place out of the income 100 of period t+1, since the marginal propensity to consume is 0.5, while there is an induced investment of 40 out of 100 income (v being 0.4).

The increase in income from period 1 to 2 is (50+40) = 90. The increase in income in different periods can be calculated as $\Delta Y_{t+2} = c\,\Delta\, Y_{t+1} + v\Delta Y_{t+1}$ = 0.5x 100 + 0.4x 100 = 90. Similarly, the increase in income in period t+3 can be calculated as $\Delta Y_{t+3} = c\Delta Y_{t+2} + v\ \Delta Y_{t+2}$ = 0.5×90+0.4×90=45+36=81.

The total increase in income (column 6) is arrived at by adding the increase in income (column 5) of the current period to the total increase in income (column 6) of the previous period. For

instance, the total increase in income (column 6) in period t + 2 of 190 is arrived at by adding the increase in income (column 5) of this period to the total increase in income 100 (of column 6) of the previous period t+1.

Similarly, the total increase in income in period t+3 of 271 = increase in income of 81 in this period plus 190 of column 6 of period t+2. This cumulative process of income propagation continues till in period t + n, induced consumption, induced investment and increase in income dwindle to zero.

If we add up the increase in consumption, investment and income from period t+1 to t+n, the total income increases to Rs 1000 crores, total consumption to Rs 500 crores and total investment to Rs 400 crores, given the initial investment of Rs 100 crores.

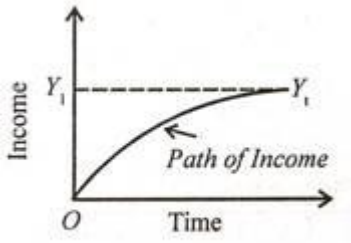

Fig. 2

The dynamic path of income is shown in the adjoining Fig. 2. Income is measured vertically and time horizontally. The curve OY_1 shows the time path of income with a super-multiplier of 10. The curve rises with time and reaches the new equilibrium level of income Y_1 and flattens out. It indicates that income increases at a decreasing rate.

3. Use of Multiplier-Accelerator Interaction in Business Cycles:

However, with different values of MPC and the accelerator, the multiplier-accelerator may show different results in terms of cyclical fluctuations. Suppose the MPC is 0.5 and the accelerator coefficient is 2. Given the same assumptions and the initial investment of Rs 100 crores, let us study how changes in income take place. Table III explains this process of income propagation.

Table III reveals that in period t+1 there is an increase of Rs. 100 crores by the amount of initial investment. This increase in income leads to a rise in consumption of Rs 50 crores (column 3) in period t+2 because the value of MPC is 0.5.

This rise in consumption induces investment of Rs 100 crores = 50 x 2 (column 4), the accelerator coefficient being 2. And income increases to Rs 250 crores (column 2+column 3+column 4). This increased income, in turn, leads to an increase in consumption of Rs 125 crores in t+ 3 period being one-half of Rs 250 crores as the MPC is 0.5.

But consumption in period t is a function of income of the previous period. Therefore, the actual increase in consumption in period t+3 and t+2 i.e. 125-50=75. If we multiply this increase in consumption 75 by the value of the accelerator 2, we get induced investment of 150=75×2 (column 4) in period t+3. Thus the total of columns 2+3+4 gives increase in income of Rs 375 crores in period t+3.

This increased income leads to induced consumption of 187.50 (column 3) in period t+4, since MPC=0.5. The difference of induced consumption of period t+4 and t+3 (187.50 minus 125) is 62.50 which multiplied by the value of the accelerator 2 gives the figure of 125 of induced investment (column 4).

And the total of columns 2, 3 and 4 gives the increase in income of Rs 412.50 crores (column 5) in period t+4, and so on. The increase in income is the highest in period t+4 which shows the peak of the cycle. Thereafter, it starts falling till it reaches the bottom or trough when income is minus Rs 11.70 crores in period t+8.

Table III: Multiplier – Accelerator Interaction (Rs Crore)

Time(t)	**Initial Investment**	**Induced Consumption(c=0.5)**	**Induced Investment**

(1)	(2)	(3)	(4)
0	0	0	0
t+1	100	—	—
t+2	100	50	100
t+3	100	125	150
t+4	100	187.50	125
t+5	100	206.25	37.50
t+6	100	171.88	-68.74
t+7	100	101.57	-140.62
t+8	100	30.48	-142.18
t+9	100	-5.48	-72.66
t+10	100	10.75	33.20

From period t+9, it again starts rising which shows the revival phase of the cycle. This behaviour of income as a result of the combined operation of the multiplier and the accelerator reveals that income first rises, then falls and again rises at constant amplitudes. The actual behaviour of the

cycle, however, depends on the values of the multiplier and the accelerator, as shown by Samuelson in his model.

Kurihara points out that a less than unity marginal propensity to consume provides an answer to the question. Why does the cumulative process come to a stop before a complete collapse or before full employment? According to Hansen, this is due to the fact that a large part of the increase in income in each period is not spent on consumption in each successive period.

This eventually leads to a decline in the volume of induced investment and when such a decline exceeds the increase in induced consumption, a decline in income sets in. Thus, writes Hansen, "It is the marginal propensity to save which calls a halt to the expansion process even when the expansion is intensified by the process of acceleration on top of the multiplier process."

THEORIES OF TRADE CYCLE / BUSINESS CYCLE

Economists have identified different causes for the occurrence of trade cycle in an economy and formulated various theories of trade cycles. A systematic study of business cycles, however, is a relatively recent development. Most of the important contributions to the theory of business cycle were made in the first half of the twentieth century though business cycles has taken place throughout the nineteenth century.

Theories of Business Cycle

The classical economists, Adam Smith, Mill, Malthus and Ricardo, have devoted little attention to the causes of business cycles. The classical school believed that Say's law, i.e.,

"Supply creates its own demand,"

was a valid representation of the world economic behavior and that unemployment appears only if wages and interest rates are inflexible. Market forces, what Adam Smith called "invisible hand" would by themselves maintain stability in the economy. Between 1890 and first World War, however, a number of important contributions were made to the trade cycle theory.

Although many important contributions were made to the theory of business cycle prior to the Great Depression, the study of business cycle still remained outside the general economic theory. It was Keynes, who provided a general theoretical framework, in which the theory of business cycle could be interwoven. In his General Theory he provided standard tools for analyzing the economic fluctuations though he himself had said little about the cause of cyclical fluctuations.

Hicks has remarked that Keynesian economics had done all for understanding of business fluctuations but has left out the analysis of business cycle itself. In the post-Keynesian era, the main contributors to the cycle theory include Metzler, Harrod, Samuelson, Kaldor, Hicks, Goodwin and Duesanberry.

The following theories are important contributions. For the sake of clarity, the theories can be classified as

Non-monetary theories
These theories emphasis non-monetary causes. The non-monetary theories are:

1. Stanley Jevon's sunspot theory.
2. Pigou's psychological theory.
3. Socialist's over production theory.
4. Douglas and Hobson's over-saving theory/under consumption theory.
5. Schumpeter's innovation theory.
6. Cobweb theorem.

Monetary theories
These asserts monetary causes. The monetary theories of trade cycle include,

1. Hawtrey's theory of business cycle.
2. Hayek's over investment theory.
3. Keyne's theory of business cycle and
4. Hick's'theory of business cycle.

In addition, there are good number of theories on business cycle propounded by economists. Here, we can discuss. only a few important theories briefly.

Sun spot theory or climatic theory
This theory advocated by Jevons and Moore states that good climate and bad climate are responsible for good and bad harvest and consequently economies enjoy periods of prosperity and adversity. The climatic variations are supposed to be caused by the spots in the sun and hence the name sun spot theory. Of course, this theory is not accepted in modern times, as the trade cycles is not restricted to agricultural sector alone or to agricultural countries alone. Even highly industrialized countries undergo the experience of trade cycles.

Psychological theory
This theory was propounded by Pigou, Beveridge and others, It is based on the psychological feeling of optimism and pessimism in businessmen. This results in boom and depression in the economy. The wave of optimism creates herd psychology and businessmen undertake business activity enthusiastically. This theory is only partly true. Though psychological aspects give momentum to an activity, the theory does not explain how the boom or slump is initiated. The theory fails to explain as to how a depression starts and how a recovery begins.

Hawtrey's theory or Monetary theory

According to Hawtrey, “Trade cycle is purely a monetary phenomenon” and he strongly advocated that changes in the flow of money are exclusively responsible for the ranges in economic activity which in turn create boom or depression.

The basic cause of boom or depression according to Hawtrey is the changes in the volume of money which are brought about by the changes in the rate of interest. A reduction of rate of interest by the banking institutions would enthuse the businessmen to borrow more and more and expand business activity. If the rate of interest is increased, borrowings get reduced and as such the business activities get reduced. In short, Hawtrey’s theory is nothing but inflation and deflation created by the rate of interest.
This theory holds good only when the monetary system is under “Gold standard” where the money supply would be rigidly fixed on the basis of gold stock. But in modern days, in the absence of gold standard, the theory has become very weak. Further, borrowing and investments will not depend upon the rate of interest and it could not be the cause of prosperity and depression. If that be the case, controlling a boom and solving a depressionary trend would lend an easy monetary solution of contracting and expanding money through the rate of interest. This may be one of the causes and not the only cause influencing trade cycle.

Keyne’s theory of trade cycle
Keynes did not formulate a separate theory of trade cycle, but he has given it as a by-product of his main theory of Income and employment propounded in the “General theory”.

According to Keynes, trade cycle may be regarded

as being occasioned by a cyclical change in the marginal efficiency of capital though complicated and often aggravated by associated changes in the other significant short period variables of the economic system.

Thus, the primary cause, of cyclical fluctuations is the marginal efficiency of capital (MEC) i.e. changes in the rate of profit on current investment outlay and also due to changes in the rate of interest. According to Keynes, MEC forms the vital factor in guiding investment decisions of businessmen. But this factor depends on businessmen’s anticipation of future prospects, i.e. on the psychology of inventors. In such a case, this theory approaches very near to psychological theory.