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Keynesian Theory of National Income determination

According to Keynes, there can be different sources of national income, such as government, foreign trade, individuals, businesses and trusts.

For determining national income, Keynes had divided the different sources of income into four sectors namely' household sector, business sector, government sector, and foreign sector.

He prepared three models for the determination of national income, which are shown in Figure-1:

The two-sector model of economy involves households and businesses only, while three-sector model represents households businesses, and government. On the other hand, the four-sector model contains households, businesses, government, and foreign sector.Let us discuss these three types of models of income determination given by Keynes.

Determination of National Income in Two-Sector Economy:

The determination of level of national income in the two-sector economy is based on an assumption that two-sector economy is an economy where there is no intervention of the government and foreign trade.

Apart from this, an economy can be a two-sector economy if it satisfies the following assumptions :

a. **Comprises only two sectors, namely, households and businesses. The households are the owners of factors of production and provide factor services to businesses to earn their livelihood in the form of wages, rents, interest, and profits. In addition the households are the consumers of final goods and services produced by businesses. On the other hand, businesses purchase factor services from households to produce goods and services and sell it to households.**
b. **Does not have government interference. If government is there, it does not have any role to play in the economic activity of a country. For example, in the**

two-sector economy, the government is not involved in activities, such as taxation, expenditure, and consumption.

c. **Comprises a closed economy in which the foreign trade does not exist. In other words, import and export services are absent in such an economy.**

d. **Contains no profit that is undistributed or savings by the organization. In other words, the profit earned by an organization is completely distributed in the form of dividends among shareholders.**

e. **Keeps the prices of goods and services, supply of factors of production, and production technique constant throughout the life cycle of organization.**

Keynes believed that there are two major factors that determine the national income of a country. These two factors are Aggregate Supply (AS) and Aggregate Demand (AD) of goods and services.

In addition, he believed that the equilibrium level of national income can be estimated when AD=AS. Before representing the relationship between AS and AD on a graph, let us understand these two concepts in detail.
AS can be defined as total value of goods and services produced and supplied at a particular point of time. It comprises consumer goods as well as producer goods. When goods and services produced at a particular point of time is multiplied by the respective prices of goods and services, it provides the total value of the national output. The national output is the aggregate supply in the form of money value. The Keynesian AS curve is drawn based on an assumption that total income is equal to total expenditure. In other words, the total income earned is fully spent on different types of goods and services.

Aggregate Supply Curve :

According to Keynes theory of national income determination, the aggregate income is always equal to consumption and savings.

The formula used for aggregate income determination:

Aggregate Income = Consumption(C) + Saving (S)

Therefore, the AS schedule is usually called C + S schedule. The AS curve is also named as Aggregate Expenditure (AE) curve.

Aggregate Demand curve :

AD refers to the effective demand that is equal to the actual expenditure. Aggregate effective demand refers to the aggregate expenditure of an economy in a specific time frame. AD involves two concepts, namely, AD for consumer goods or consumption (C) and aggregate demand for capital goods or investment (I).

Therefore, the AD can be represented by the following formula:

AD = C + I

Therefore, AD schedule is also termed as C+I schedule. According to Keynes theory of national income determination in short-run investment (I) remains constant throughout the AD schedule, while consumption (C) keeps on changing. Therefore, consumption (C) acts as the major determinant or function of income (Y).

The consumption function can be expressed as follows

As for consumption demand, it depends upon the propensity to consume of the community and the level of national income. Given the propensity to consume, as income increases, consumption demand will also increase. In other words, given the propensity to consume, consumption demand is a function of income.

Consumption function can take several forms. The most common form of short-run consumption function is where a is the intercept term of the function and represents autonomous consumption whereas b represents the slope of the consumption function.

C= a + bY

According to Keynes's theory current consumption expenditure depends primarily on current income. Further, according to Keynes, the chief factor that determines consumption expenditure is disposable income, that is, income, available after taxes. Increase in personal taxes reduces personal disposable income and therefore consumption expenditure.

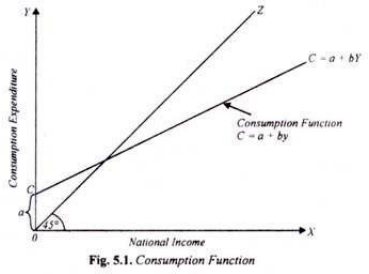

Fig. 5.1. *Consumption Function*

Consider Fig. 5.1 in which national income is measured along the X-axis and consumption demand (C) is shown on the Y-axis. In this figure, a straight line OZ which makes 45° angle with the X-axis has been drawn.

This straight line OZ with 45° angle with the X-axis represents the reference income line to measure the difference between consumption and level of income. This is also often called income line. This 45° line represents national income in money terms. In fact, national product and income are the same things. In this figure a curve C has also been drawn which represents consumption function, C = a + by of the community.

This curve of consumption function slopes upward from left to right, which shows that as income increases the amount of consumption demand also increases. As income line OZ

makes 45° angle with the X-axis, the gap between the consumption function curve C and the income line OZ represents the saving of the community.

The reason for this is that a part of the income is consumed and a part is saved, i.e., National Income = Consumption + Saving. This is also written as Y = C + S, where y represents income, C consumption and S saving. It will be seen from Fig. 5.1 that the gap between the consumption function curve C and the income line OZ goes on increasing as income increases. In other words, the amount of saving or saving gap increases as income increases.

It is worth mentioning that in the short-run consumption function does not change. This is because the propensity to consume, that is, the whole consumption function curve C depends upon the tastes, preferences, the income distribution in the society, the population level, wealth of the people etc., which do not undergo much change in the short run. The implication of the stability of consumption function is that the consumption demand is primarily determined by the level of current national income.
However, through changes in monetary policy and fiscal policy by the Government the consumption function can be shifted. For example, when rate of interest, an instrument of monetary policy, is reduced, the people borrow more for durable consumer goods such as cars, air conditioners, houses and with this at a given level of income consumption demand increases causing upward shift in the consumption function curve.

Similarly, when income tax, an instrument of fiscal policy, is reduced disposable income of the households increases and as a result at a given level of national income (GDP), consumption demand rises leading to the upward shift in consumption function.

Investment Demand:

The other component of the aggregate demand is investment which is a crucial factor in the determination of equilibrium level of national income.

Investment demand depends upon two factors:

(1) Marginal efficiency of capital and

(2) Rate of interest.

Of these two factors, rate of interest is comparatively stable and does not frequently change in the short run. Therefore, the fluctuations in the level of investment demand chiefly depend upon the changes in the marginal efficiency of capital.

The marginal efficiency of capital means the expected rate of profit which the business community hopes to get from the investment in capital Fig. 5.2. Investment Marginal efficiency of capital depends upon the replacement cost of the capital goods on the one hand, and profit expectations of entrepreneurs on the other.

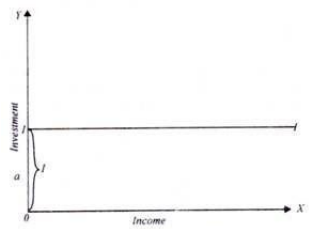

Fig. 5.2. *Investment*

Profit expectations are more important because they often change even in the short run and cause fluctuations in investment. If the level of national income and employment is desired to be raised in a free market capitalist economy, then steps should be taken which will raise the expectations of the entrepreneurs (i.e., business firms) regarding profit-earning from investment.

In any particular year, there will be a given level of investment demand which, as seen above, is determined by marginal efficiency of capital and a given rate of interest. However, in Keynes's theory investment being determined by marginal efficiency of capital and rate of interest does not depend on the level of income.

Thus, in Keynesian theory of income determination, investment does not vary with change in income. In other words, in Keynes 'income-expenditure analysis investment is treated as autonomous of income, that is, investment does not change with a change in the level of income.

In actual practice when the level of income rises, the demand for goods will also rise and this will favourably affect the expectations of the entrepreneurs regarding making of profits. Rise in the profit expectations will raise the marginal efficiency of capital which in turn will increase the level of investment. But it is quite clear that investment demand does not directly depend upon income; it is only affected indirectly by changes in income.

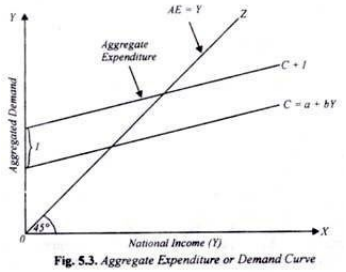

Fig. 5.3. *Aggregate Expenditure or Demand Curve*

Therefore, in our Figure 5.3 we have taken a given amount of investment demand independent of the level of income and added it to upward sloping consumption function curve to get aggregate expenditure curve C + I. The distance between the C curve and the C + I curve is parallel to the C curve throughout which indicates that the level of investment is constant and does not change with the change in income.

It may however be noted that with either a change in the rate of interest or marginal efficiency of capital investment will change. Therefore, in income-expenditure diagram as shown in Fig. 5.3, a different new amount of investment of will have to be taken.

Equilibrium Level of National Income:

Now, we shall explain how through the intersection of aggregate demand and aggregate supply curves the equilibrium level of national income is determined in Keynes's two sector model. C + I curve represents the aggregate expenditure and 45° OZ line represents aggregate supply of output.

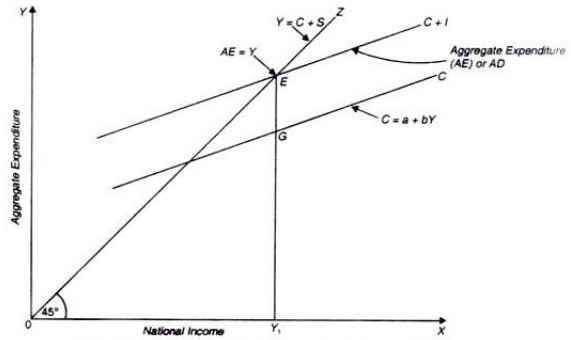

Fig. 5.5. *Determination of National Income : Basic Keynesian Model*

Normally the goods and services are produced by firms when they think they can sell them in the market. There will be equilibrium in the goods market when total output of goods and services produced will be equal to the total demand for output. Aggregate demand for them is represented by aggregate expenditure. In equilibrium aggregate expenditure (which is denoted by AE) must equal aggregate output (GDP). Since aggregate output or GDP equals national income (K) we have the following condition for equilibrium.

AE = GDP = Y

It will be seen in Fig. 5.5 that aggregate expenditure curve (AE) or C + I curve intersects 45° line at point E which satisfies the equilibrium condition. That is, a point E which corresponds to the income level OY1 aggregate expenditure is equal to aggregate output. Therefore, E is the equilibrium point and OY1 represents the equilibrium level of national income. Now, income cannot be in equilibrium at levels smaller than OY1, since aggregate expenditure exceeds aggregate supply of output as C+I curve which depicts aggregate expenditure of output lies above 45° line.

This excess demand will be met by the firms selling goods from their stocks or inventories of goods kept by them. This leads to the decline in inventories of goods below the desired levels. This unintended fall in inventories will induce the firms to expand their output of goods and services to meet the extra demand for them and keep their inventories of goods at the desired levels.

Thus when at a given level of national income, aggregate expenditure (i.e., aggregate demand) exceeds aggregate output, national income will increase. With this increase in national income or output, employment of labour will also rise to produce the increment in output. This process of expansion in output under the pressure of excess demand will continue till national income OY1 is reached.

On the country, the equilibrium level of national income cannot be greater than OY1 because at any level greater than OY1 aggregate expenditure or demand (C + I) falls short of aggregate output. This will cause the increase in inventories of goods with the firms beyond the desired levels.

To this situation of the unintended increase in inventories of goods, the firms will respond by cutting down production to keep their inventories at the desired levels. Thus, deficiency in aggregate demand relative to the aggregate supply of output will lead to the fall in national income and output until the level OY1 is reached where aggregate expenditure (C +I) is equal to the value of aggregate output. Thus, OY1 is the equilibrium level of national income.

Principle of Effective Demand :

effective demand is that level of aggregate demand (aggregate expenditure) which becomes effective in determining equilibrium level of income because it is equal to aggregate supply of output. This is called Keynesian principle of effective demand. In Fig. 5.5, the effective demand is equal to Y1E. Note that the level of national income OY1 which has been determined, equals the effective demand Y1E (OY1 = Y1E).

There are several other points on the aggregate demand (expenditure) curve but what distinguishes effective demand from all these points is that at this point aggregate demand is equal to aggregate output. On all other points aggregate demand is either more or less than aggregate output. Thus, the level of national income is determined by and equal to effective demand.

In a two sectors Keynesian model, we can express the principle of effective demand in symbolic terms as under:

Y= AE or AD

AD= C + I

Y= AD = C + I

where Y = National Income

AD = Effective demand

C = Consumption demand

I = Investment

Note that star mark on AE or AD shows the aggregate demand which becomes effective.