MACRO ECONOMICS I

SEMESTER V

PAPER-9

Objective

To make the students understand the important of macro economic concepts like employment, income, interest money, investment, monetary and fiscal policy etc., and their mutual dependence in a achieving the National goal.

UNIT – I

Nature of Macro Economics - Macro Economic Variables, Macro Statics, Comparative Statics and Dynamics, stock and flow, Macro Economic Models.

UNIT – II

National income - Concept and measurement - GDP-GNP - Importance and uses of national income analysis, circular flow of income, difficulties in measuring national income, social accounting.

UNIT – III

Classical theory of employment, and output-say's Law of market, Keynesian theory of income, output and employment, aggregate demand and aggregate supply, principles of effective demand.

UNIT – IV

Consumption function - keynesian psychological consumption function and its implications, Determinants of consumption function.

UNIT – V

Investment function-Keynes-autonomous and induced investment – Marginal Efficiency of Capital (MEC) and rate of interest.

BOOKS FOR REFERENCE:

1. Ahuja, H.L., : Macro Economics, Theory and Policy, S. Chand & Co.,

2. Amit Bhaduri : Macro Economics, Macmillan Co.

3. Barro, Robert.J : Macro Economics, John Wilely and Sons, New York

4. Crouch : Macro Economics

5. Brooman : Macro Economics

6. Dernberg & McDougal : Macro Economics

7. Dillard,D : Economics of J. M .Keynes

8. Duesen berry,James,S : Business Cycles and Economics Growth, McGraw Hil

9. John Evans & Pritchard : Macro Economics, Macmillan

10. Lindaver : Macro Economics

11. Michl : Macro Economics Theory, Prentice Hall

12. Sankaran,S : Macro Economics, Margham Publications.

13. Shapiro, E : Macro Economics Analysis

14. Turnovsky : Methods of Macro Economic Dynamics, Prentice Hall.

15. M.L.Jingan : Advanced Economic Theory

UNIT I

The Nature and Scope of Macroeconomics

Introduction:

The term ‘macro’ was first used in economics by Ragner Frisch in 1933. But as a methodological approach to economic problems, it originated with the Mercantilists in the 16th and 17th centuries. They were concerned with the economic system as a whole.

In the 18th century, the Physiocrats adopted it in their Table Economies to show the ‘circulation of wealth’ (i.e., the net product) among the three classes represented by farmers, landowners and the sterile class. Malthus, Sismondi and Marx in the 19th century dealt with macroeconomic problems. Walras, Wicksell and Fisher were the modern contributors to the development of macroeconomic analysis before Keynes.

Certain economists, like Cassel, Marshall, Pigou, Robertson, Hayek and Hawtrey, developed a theory of money and general prices in the decade following the First World War. But credit goes to Keynes who finally developed a general theory of income, output and employment in the wake of the Great Depression.

1. Nature of Macroeconomics:

Macroeconomics is the study of aggregates or averages covering the entire economy, such as total employment, national income, national output, total investment, total consumption, total savings, aggregate supply, aggregate demand, and general price level, wage level, and cost structure.

In other words, it is aggregative economics which examines the interrelations among the various aggregates, their determination and causes of fluctuations in them. Thus in the words of Professor Ackley, “Macroeconomics deals with economic affairs in the large, it concerns the overall dimensions of economic life. It looks at the total size and shape and functioning of the “elephant” of economic experience, rather than working of articulation or dimensions of the

individual parts. It studies the character of the forest, independently of the trees which compose it."

Macroeconomics is also known as the theory of income and employment, or simply income analysis. It is concerned with the problems of unemployment, economic fluctuations, inflation or deflation, international trade and economic growth. It is the study of the causes of unemployment, and the various determinants of employment.

In the field of business cycles, it concerns itself with the effect of investment on total output, total income, and aggregate employment. In the monetary sphere, it studies the effect of the total quantity of money on the general price level.

In international trade, the problems of balance of payments and foreign aid fall within the purview of macroeconomic analysis. Above all, macroeconomic theory discusses the problems of determination of the total income of a country and causes of its fluctuations. Finally, it studies the factors that retard growth and those which bring the economy on the path of economic development.

The obverse of macroeconomics is microeconomics. Microeconomics is the study of the economic actions of individuals and small groups of individuals. The "study of particular firms, particular households, individual prices, wages, incomes, individual industries, particular commodities." But macroeconomics "deals with aggregates of these quantities; not with individual incomes but with the national income, not with individual prices but with the price levels, not with individual output but with the national output."

Microeconomics, according to Ackley, "deals with the division of total output among industries, products, and firms, and the allocation of resources among competing uses. It considers problems of income distribution. Its interest is in relative prices of particular goods and services."

Macroeconomics, on the other hand, "concerns itself with such variables as the aggregate volume of the output of an economy, with the extent to which its resources are employed, with the size of the national income, with the 'general price level'."

Both microeconomics and macroeconomics involve the study of aggregates. But aggregation in microeconomics is different from that in macroeconomics. In microeconomics the interrelationships of individual households, individual firms and individual industries to each other deal with aggregation.

"The concept of 'industry', for example, aggregates numerous firms or even products. Consumer demand for shoes is an aggregate of the demands of many households, and the supply of shoes is an aggregate of the production of many firms.

The demand and supply of labour in a locality are clearly aggregate concepts." "However, the aggregates of microeconomic theory," according to Professor Bilas, "do not deal with the behaviour of the billions of dollars of consumer expenditures, business investments, and government expenditures. These are in the realm of microeconomics."

Thus the scope of microeconomics to aggregates relates to the economy as a whole, "together with sub-aggregates which (a) cross product and industry lines (such as the total production of consumer goods, or total production of capital goods), and which (b) add up to an aggregate for the whole economy (as total production of consumer goods and of capital goods add up to total production of the economy; or as total wage income and property income add up to national income)." Thus microeconomics uses aggregates relating to individual households, firms and industries, while macroeconomics uses aggregates which relate them to the "economy wide total".

Scope and Importance of Macroeconomics:

As a method of economic analysis macroeconomics is of much theoretical and practical importance.

(1) To Understand the Working of the Economy:

The study of macroeconomic variables is indispensable for understanding the working of the economy. Our main economic problems are related to the behaviour of total income, output, employment and the general price level in the economy.

These variables are statistically measurable, thereby facilitating the possibilities of analysing the effects on the functioning of the economy. As Tinbergen observes, macroeconomic concepts help in "making the elimination process understandable and transparent". For instance, one may not agree on the best method of measuring different prices, but the general price level is helpful in understanding the nature of the economy.

(2) In Economic Policies:

Macroeconomics is extremely useful from the point of view of economic policy. Modern governments, especially of the underdeveloped economies, are confronted with innumerable national problems. They are the problems of overpopulation, inflation, balance of payments, general underproduction, etc.

The main responsibility of these governments rests in the regulation and control of overpopulation, general prices, general volume of trade, general outputs, etc. Tinbergen says: "Working with macroeconomic concepts is a bare necessity in order to contribute to the solutions of the great problems of our times." No government can solve these problems in terms of individual behaviour. Let us analyse the use of macroeconomic study in the solution of certain complex economic problems.

(i) In General Unemployment:

The Keynesian theory of employment is an exercise in macroeconomics. The general level of employment in an economy depends upon effective demand which in turn depends on aggregate demand and aggregate supply functions.

Unemployment is thus caused by deficiency of effective demand. In order to eliminate it, effective demand should be raised by increasing total investment, total output, total income and total consumption. Thus, macroeconomics has special significance in studying the causes, effects and remedies of general unemployment.

(ii) In National Income:

The study of macroeconomics is very important for evaluating the overall performance of the economy in terms of national income. With the advent of the Great Depression of the 1930s, it became necessary to analyse the causes of general overproduction and general unemployment.

This led to the construction of the data on national income. National income data help in forecasting the level of economic activity and to understand the distribution of income among different groups of people in the economy.

(iii) In Economic Growth:

The economics of growth is also a study in macroeconomics. It is on the basis of macroeconomics that the resources and capabilities of an economy are evaluated. Plans for the overall increase in national income, output, and employment are framed and implemented so as to raise the level of economic development of the economy as a whole.

(iv) In Monetary Problems:

It is in terms of macroeconomics that monetary problems can be analysed and understood properly. Frequent changes in the value of money, inflation or deflation, affect the economy adversely. They can be counteracted by adopting monetary, fiscal and direct control measures for the economy as a whole.

(v) In Business Cycles:

Further macroeconomics as an approach to economic problems started after the Great Depression. Thus its importance lies in analysing the causes of economic fluctuations and in providing remedies.

(3) For Understanding the Behaviour of Individual Units:

For understanding the behaviour of individual units, the study of macroeconomics is imperative. Demand for individual products depends upon aggregate demand in the economy. Unless the causes of deficiency in aggregate demand are analysed, it is not possible to understand fully the reasons for a fall in the demand of individual products.

The reasons for increase in costs of a particular firm or industry cannot be analysed without knowing the average cost conditions of the whole economy. Thus, the study of individual units is not possible without macroeconomics.

Conclusion:

We may conclude that macroeconomics enriches our knowledge of the functioning of an economy by studying the behaviour of national income, output, investment, saving and consumption. Moreover, it throws much light in solving the problems of unemployment, inflation, economic instability and economic growth.

Limitations of Macroeconomics:

There are, however, certain limitations of macroeconomic analysis. Mostly, these stem from attempts to yield macroeconomic generalisations from individual experiences.

(1) Fallacy of Composition:

In Macroeconomic analysis the "fallacy of composition" is involved, i.e., aggregate economic behaviour is the sum total of individual activities. But what is true of individuals is not necessarily true of the economy as a whole.

For instance, savings are a private virtue but a public vice. If total savings in the economy increase, they may initiate a depression unless they are invested. Again, if an individual depositor withdraws his money from the bank there is no ganger. But if all depositors do this simultaneously, there will be a run on the banks and the banking system will be adversely affected.

(2) To Regard the Aggregates as Homogeneous:

The main defect in macro analysis is that it regards the aggregates as homogeneous without caring about their internal composition and structure. The average wage in a country is the sum total of wages in all occupations, i.e., wages of clerks, typists, teachers, nurses, etc.

But the volume of aggregate employment depends on the relative structure of wages rather than on the average wage. If, for instance, wages of nurses increase but of typists fall, the

average may remain unchanged. But if the employment of nurses falls a little and of typists rises much, aggregate employment would increase.

(3) Aggregate Variables may not be Important Necessarily:

The aggregate variables which form the economic system may not be of much significance. For instance, the national income of a country is the total of all individual incomes. A rise in national income does not mean that individual incomes have risen.

The increase in national income might be the result of the increase in the incomes of a few rich people in the country. Thus a rise in the national income of this type has little significance from the point of view of the community.

Prof. Boulding calls these three difficulties as "macroeconomic paradoxes" which are true when applied to a single individual but which are untrue when applied to the economic system as a whole.

(4) Indiscriminate Use of Macroeconomics Misleading:

An indiscriminate and uncritical use of macroeconomics in analysing the problems of the real world can often be misleading. For instance, if the policy measures needed to achieve and maintain full employment in the economy are applied to structural unemployment in individual firms and industries, they become irrelevant. Similarly, measures aimed at controlling general prices cannot be applied with much advantage for controlling prices of individual products.

(5) Statistical and Conceptual Difficulties:

The measurement of macroeconomic concepts involves a number of statistical and conceptual difficulties. These problems relate to the aggregation of microeconomic variables. If individual units are almost similar, aggregation does not present much difficulty. But if microeconomic variables relate to dissimilar individual units, their aggregation into one macroeconomic variable may be wrong and dangerous.

2. Difference between Microeconomics and Macroeconomics:

The difference between microeconomics and macroeconomics can be made on the following counts. The word micro has been derived from the Greek word mikros which means small. Microeconomics is the study of economic actions of individuals and small groups of individuals. It includes particular households, particular firms, particular industries, particular commodities and individual prices.

Macroeconomics is also derived from the Greek word makros which means large. It "deals with aggregates of these quantities, not with individual incomes but with the national income, not with individual prices but with the price levels, not with individual output but with the national output."

The objective of microeconomics on demand side is to maximize utility whereas on the supply side is to minimize profits at minimum cost. On the other hand, the main objectives of macroeconomics are full employment, price stability, economic growth and favourable balance of payments.

The basis of microeconomics is the price mechanism which operates with the help of demand and supply forces. These forces help to determine the equilibrium price in the market. On the other hand, the basis of macroeconomics is national income, output and employment which are determined by aggregate demand and aggregate supply.

Microeconomics is based on different assumptions concerned with rational behaviour of individuals. Moreover the phrase ceteris paribus is used to explain the economic laws. On the other hand, macroeconomics bases its assumptions on such variables as the aggregate volume of output of an economy, with the extent to which its resources are employed, with the size of the national income and with the general price level.

Microeconomics is based on partial equilibrium analysis which helps to explain the equilibrium conditions of an individual, a firm, an industry and a factor. On the other hand, macroeconomics is based on general equilibrium analysis which is an extensive study of a number of economic variables, their interrelations and interdependences for understanding the working of the economic system as a whole.

In microeconomics, the study of equilibrium conditions are analysed at a particular period. But it does not explain the time element. Therefore, microeconomics is considered as a static analysis. On the other hand, macroeconomics is based on time-lags, rates of change, and past and expected values of the variables. This rough division between micro and macroeconomics is not rigid, for the parts affect the whole and the whole affects the parts.

3. Dependence of Microeconomic Theory on Macroeconomics:

Take for instance, when aggregate demand rises during a period of prosperity, the demand for individual products also rises. If this increase in demand is due to a reduction in the rate of interest, the demand for ‘ different types of capital goods will go up. This will lead to an increase in the demand for the particular types of labour needed for the capital goods industry. If the supply of such labour is less elastic, its wage rate will rise.

The rise in wage rate is made possible by increase in profits as a consequence of increased demand for capital goods. Thus, a macroeconomic change brings about changes in the values of microeconomic variables in the demands for particular goods, in the wage rates of particular industries, in the profits of particular firms and industries, and in the employment position of different groups of workers.

Similarly, the overall size of income, output, employment, costs, etc. in the economy affects the composition of individual incomes, outputs, employment, and costs of individual firms and industries. To take another instance, when total output falls in a period of depression, the output of capital goods falls more than that of consumer goods. Profits, wages employment decline more rapidly in capital goods industries than in the consumer goods industries.

4. Dependence of Macroeconomics on Microeconomic Theory:

On the other hand, macroeconomic theory is also dependent on microeconomic analysis. The total is made up of the parts. National income is the sum of the incomes of individuals, households, firms and industries. Total savings, total investment and total consumption are the result of the saving, investment and consumption decisions of individual industries, firms, households and persons.

The general price level is the average of all prices of individual goods and services. Similarly, the output of the economy is the sum of the output of all the individual producing units. Thus, “the aggregates and averages that are studied in macroeconomics are nothing but aggregates and averages of the individual quantities which are studied in microeconomics.”

Let us take a few concrete examples of this macro dependence on microeconomics. If the economy concentrates all its resources in producing only agricultural commodities, the total output of the economy will decline because the other sectors of the economy will be neglected.

The total level of output, income and employment in the economy also depends upon income distribution. If there is unequal distribution of income so that income is concentrated in the hands of a few rich, it will tend to reduce the demand for consumer goods.

Profits, investment and output will decline, unemployment will spread and ultimately the economy will be faced with depression. Thus, both macro and micro approaches to economic problems are interrelated and interdependent.

5. Macro Statics, Macro Dynamics and Comparative Statics:

Micro Statics:

The word ‘statics’ is derived from the Greek word statike which means bringing to a standstill. In physics, it means a state of rest where there is no movement. In economics, it implies a state characterised by movement at a particular level without any change. It is a state, according to Clark, where five kinds of changes are conspicuous by their absence.

The size of population, the supply of capital, methods of production, and forms of business organisation and wants of the people remain constant, but the economy continues to work at steady pace. “It is to this active but unchanging process,” writes Marshall, “that the expression static economics should be applied.” Static economy is thus a timeless economy where no changes occur and it is necessarily in equilibrium. Indices are adjusted instantaneously: current demand, output and prices of goods and services.

As pointed out by Prof. Samuelson “Economic statics concerns itself with the simultaneous and instantaneous or timeless determination of economic variables by mutually

interdependent relations." There is neither past nor future in the static state. Hence, there is no element of uncertainty in it. Prof. Kuznets, therefore, believes that "static economics deals with relations and processes on the assumption of uniformity and persistence of either the absolute or relative economic quantities involved."

Macro-statics analysis explains the static equilibrium position of the economy. This is best explained by Professor Kurihara in these words, "If the object is to show a 'still picture' of the economy ii a whole, the macro-static method is the appropriate technique. For this technique is one of investigating the relations between macro-variables in the final position of equilibrium without reference to the process of adjustment implicit in that final position." Such a final position of equilibrium may be shown by the equation

$Y = C + I.$

Where Y is the total income, C is the total consumption expenditure and I, the total investment expenditure.

It simply shows a timeless identity equation without any adjusting mechanism. This macro-static model is illustrated in

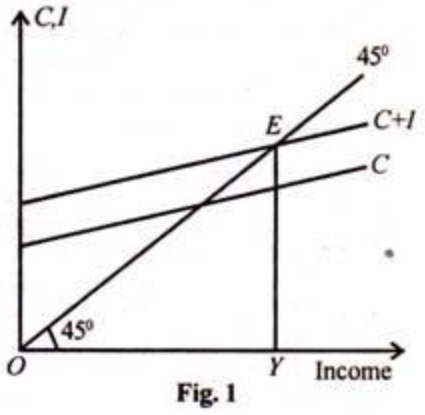


Fig. 1

Figure 1. According to this static Keynesian model, the level of national income is determined by the interaction of aggregate supply function and the aggregate demand function, In the Figure, 45° line represents the aggregate supply function and C + I line,

the aggregate demand function, 45° line and C + I curve intersect at point E, the point of effective demand which determines OY level of national income.

Thus, economic statics refers to a timeless economy. It neither develops nor decays. It is like a snapshot photo from a 'still' camera which would be the same whether the previous and subsequent positions of the economy were subject to change or not.

Macro Dynamics:

Economic dynamics, on the other hand, is the study of change, of acceleration or deceleration. It is the analysis of the process of change which continues through time.

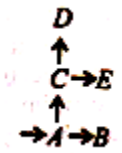
An economy may change through time in two ways:

(a) Without changing its pattern, and

(b) By changing its pattern.

Economic dynamics relates to the latter type of change. If there is a change in population, capital, techniques of production, forms of business organisation and tastes of the people, in any one or all of them, the economy will assume a different pattern, and the economic system will change its direction.

In the accompanying diagram, D given initial values of the economy, it would have proceeded along the path AB, but suddenly at A the indices change the pattern, and the direction of the equilibrium changes towards C. Again, it would have proceeded to D but at C the pattern and direction is changed to E. Thus, economic dynamics studies the path from one equilibrium position to another: from A to C and from C to E.



Economic dynamics is, therefore, concerned with time-lags, rates of change, and past and expected values of the variables. In a dynamic economy, data change and the economic system take time to adjust itself accordingly. According to Kurihara, "Macro-dynamics treats discrete

movements or rates of change of macro-variables. It enables one to see a 'motion-picture' of the functioning of the economy as a progressive whole."

The macro-dynamic model is explained in terms of the Keynesian process of income propagation where consumption is a function of the income of the preceding period, i.e., $C_t=f(Y_{t-1})$ and investment is a function of time and of constant autonomous investment ΔI, i.e., $I_1 = f(\Delta I)$.

In Figure 2, C +1 is the aggregate demand function and 45° line is the aggregate supply function. If we begin in period t_o where with an equilibrium level of income OY_0, investment is increased by ΔI, then in period t income rises by the amount of the increased investment (from t_0 to t). The increased investment is shown by the new aggregate demand function C+I+ΔI.

But in period t, consumption lags behind, and is still equal to the income at E_0. In period t + I, consumption rises and along with the new investment, it increases income still higher to OY_1.

This process of income propagation will continue till the aggregate demand function C + I + ΔI intersects the aggregate supply function 45° line at E_n in the nth period, and the new equilibrium level is determined at OY_n. The curved steps t_0 to E_n show the macro-dynamic equilibrium path.

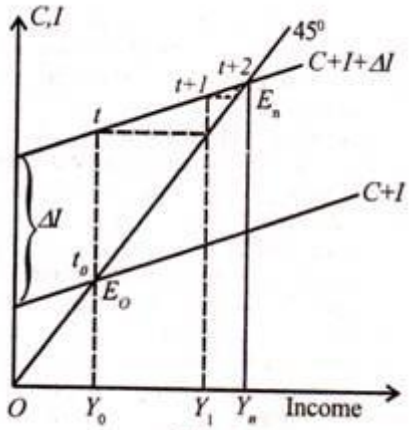


Fig. 2

Comparative Statics:

Comparative statics is a method of economic analysis which was first used by the German economist, F. Oppenheimer in 1916. Schumpeter described it as "an evolutionary process by a succession of static models." In the words of Schumpeter, "Whenever we deal with

disturbances of a given state by trying to indicate the static relations obtaining before a given disturbance impinged upon the system and after it had had time to work itself out. This method of procedure is known as Comparative Statics." To be precise, comparative statics is the method of analysis in which different equilibrium situations are compared.

A <———> B

The distinction between static, comparative static and dynamic situations is explained with the help of the accompanying figure. If the economy is working at situation A where it is producing at a constant rate without any change in the variables, it is a static state which is functioning at a point of time.

When the economy moves from the equilibrium point A to point B through time, it is economic dynamics which traces out the actual path of movement of the economy between the two static equilibrium points.

Comparative statics, on the other hand, is related to once-over change from point A to point B in which we do not study the forces behind the movement between the two points. Thus comparative statics is not concerned with the transitional period but "involves the study of variations in equilibrium positions corresponding to specified changes in underlying data."

The Keynesian employment, income and output analysis is also based on the theory of shifting equilibrium wherein it compares different equilibrium levels of income. According to Kurihara, Keynes made no attempt to show the process of transition from one position of equilibrium to another. He simply used comparative statics analysis.

Figure 3 explains two different levels of income, OY_2 at OT_1 time and OY_1 at OT_2 time. Independent of each other both the income levels relate to economic statics. But income at OY_2 level is higher than at OY_1 level. This is comparative statics which compares two static levels of income as against dynamic economics which traces out the path AB, showing increase in income.

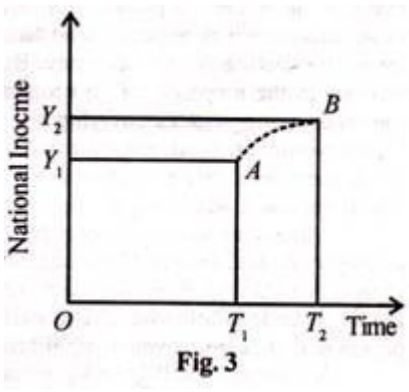


Fig. 3

Limitations:

But comparative statics is not without limitations;

1. Its scope is limited for it excludes many important economic problems. There are the problems of economic fluctuations and growth which can only be studied by the method of dynamic economics.

2. Comparative statics is unable to explain the process of change from one position of equilibrium to another. It "gives only a partial glimpse of the movements, for we have only the two 'still pictures' to compare, whereas dynamics would give us a movie."

3. We are not sure when the new equilibrium will be established because this method neglects the transitional period. This makes comparative statics an incomplete and unrealistic method of economic analysis.

Conclusion:

We sum up the discussion among macro statics, macro dynamics and comparative statics thus: Economic statics is the study of relations between economic variables at a point of time, whereas economic dynamics explains the relationship of economic variables through time.

In a static economics there is movement but no change in economic phenomena while in dynamic economics, the fundamental forces themselves change. The former studies movement around the point of equilibrium, but the latter traces the path from one point of equilibrium, to the other, both backward and forward.

On the other hand, comparative statics studies and compares two static equilibrium positions. If savings at a point of time are S_1 and at another moment of time S_2, this is once over change which is comparative statics. But if a given rise in savings leads to increase in investment, output, income and to a further rise in savings, this sequence of interdependent events of continuous changes is dynamic in nature.

No doubt economic dynamics is the antithesis of economic statics, yet the study of dynamic economics is a necessary adjunct to the hypothetical static analysis to enable economists to formulate generalisations. The raison d'etre of all static investigations is the explanation of dynamic change.

On the other hand, dynamic economics is made up of static situations. If economic dynamics is the running picture of the working of the economy, economic statics relates to the 'still', the stationary position of the economy. Thus, both economic dynamics and economic statics are essential for the study and solution of economic problems.

6. Transition from Microeconomics to Macroeconomics:

As methodological approaches, both microeconomics and macroeconomics were used by the classical and neo-classical economists in their writings. But it was Marshall who developed and perfected microeconomics as a method of economic analysis.

Similarly, it was Keynes who developed macroeconomics as a distinct method in economic theory. Therefore, the actual process of transition from microeconomics to macroeconomics started with the publication of Keynes's General Theory. This transition has taken place in the following branches of economics.

Microeconomics is the study of economic actions of individuals and small groups of individuals. It includes particular households, particular firms, particular industries, particular commodities, individual prices, wages, and incomes.

Thus microeconomics studies how resources are allocated to the production of particular goods and services and how efficiently they are distributed. But microeconomics, in itself, does

not study the problem of allocation of resources to the economy as a whole. It is concerned with the study of parts and neglects the whole.

As pointed out by Boulding, “Description of a large and complex universe of facts like the economic system is impossible in terms of individual items.” Thus the study of microeconomics presents an imprecise picture of the economy. But the orthodox economists, like Pigou, tried to apply microeconomic analysis to the problems of an economy.

Keynes thought otherwise and advocated macroeconomics which is the study of aggregates covering the entire economy such as total employment, total income, total output, total investment, total consumption, total savings, aggregate supply, aggregate demand, and general price level, wage level and cost structure. For understanding the problems facing the economy, Keynes adopted the macro approach and brought about the transition from micro to macro.

Microeconomics assumes the total volume of employment as given and studies how it is allocated among individual sectors of the economy. But Keynes rejected the assumption of full employment of resources, especially of labour.

From the macro angle, he regarded full employment as a special case. The general situation is one of underemployment. The existence of involuntary unemployment of labour in capitalist economies proves that underemployment equilibrium is a normal situation and full employment is abnormal and accidental.

Keynes refuted Pigou’s view that a cut in money wage could eliminate unemployment during a depression and bring about full employment in the economy. The fallacy in Pigou’s argument was that he extended the arguments to economy which were applicable to a particular industry.

Reduction in money wage rate can increase employment in an industry by reducing its cost of production and the price of the product thereby raising its demand. But the adoption of such a policy for the economy leads to a reduction in employment. When money wages of all

workers in the economy are reduced, their incomes are reduced correspondingly. As a result, aggregate demand falls leading to a decline in employment in the economy as a whole.

Microeconomics takes the absolute price level as given and concerns itself with relative prices of goods and services. How the price of a particular commodity like rice, tea, milk, fan, scooter, etc. is determined? How the wages of a particular type of labour, interest on a particular type of capital asset, rent on a particular land, and profits of an individual entrepreneur are determined? But an economy is not concerned with relative prices but with the general level of prices.

And the study of the general level of prices falls within the domain of macroeconomics. It is the rise or fall in the general price level that leads to inflation, and to prosperity and depression. Prior to the publication of Keynes's General Theory, economists concerned themselves with the determination of relative prices and failed to explain the causes of inflation and deflation or prosperity and depression.

They attributed the rise or fall in the price level to the increase or decrease in the quantity of money. Keynes, on the other hand, showed that deflation and depression were caused by the deficiency of aggregate demand, and inflation and prosperity by the increase in aggregate demand. It is thus the rise or fall in aggregate demand which affects the general price level rather than the quantity of money.

Moreover, microeconomics being based on the assumption of full employment, it failed to provide an adequate explanation of the occurrence of trade cycles. It could not explain the turning points of the business cycles. By discarding the unrealistic assumption of full employment, Keynes and his followers have built models which not only explain the macroeconomic forces lying behind cyclical fluctuations but also explain the turning points of the cycle.

Another factor which has led to the transition from microeconomics to macroeconomics is the failure of microeconomics to deal with problems relating to the growth of the economy. Microeconomics concerns itself with the study of individual household, firm or industry.

But principles which are applicable to a particular household, firm or industry may not be applicable to the economy as a whole. This is because the level of aggregation differs in micro theory from macro theory. The classical economists committed the folly of applying micro theory to the economy as a whole while explaining economic growth.

They emphasised the importance of saving or thrift in capital formation for economic growth. But in macro theory saving is a private virtue and a public vice. This is because increase in aggregate saving leads to a decline in aggregate consumption and demand, thereby decreasing the level of employment in the economy.

Therefore, to remove unemployment and bring economic growth require increase in aggregate investment rather than saving. For economic growth, Harrod and Domar have emphasised the dual role of investment. First, it increases aggregate income, and second, it increases the productive capacity of the economy.

Microeconomics is based on the laissez-faire policy of a self-adjusting economic system with no government intervention. The classical economists were the votaries of laissez-faire policy. They believed in the automatic adjustment in the malfunctioning of the economy.

They, therefore, had no faith either in monetary policy or fiscal policy for removing distortions in the economy. They also believed in the policy of balanced budgets. Keynes, who brought about the transition from micro to macro thinking, discarded the policy of laissez-faire.

He believed that such a policy did not operate in public interest and it was this policy which had led to the Great Depression of 1930s. He, therefore, favoured state intervention and stressed the importance of deficit budgets during deflation and surplus budgets during inflation, along with cheap money and dear money policies respectively. The Keynesian policy measures have been adopted along with direct controls by the capitalist countries of the world.

7. Stock and Flow Concepts:

The aggregates of macroeconomics are of two kinds. Some are stocks, typically the stock of capital K which is a timeless concept. Even in period analysis, a stock must be specified at a

particular moment. Other aggregates are flows such as income and output, consumption and investment. A flow variable has the time dimension t, as per unit of time or per period.

Stock is the quantity of an economic variable relating to a point of time. For example, store of cloth in a shop at a point of time is stock. Flow is the quantity of an economic variable relating to a period of time. The monthly income and expenditure of an individual, receipt of yearly interest rate on various deposits in a bank, sale of a commodity in a month are some examples of flow. The concepts of stock and flow are used in the analysis of both microeconomics and macroeconomics.

In Microeconomics:

In price theory or microeconomics, the concepts of stock and flow are related to the demand for and supply of goods. The market demand and supply of goods at a point of time are expressed as stock. The stock- demand curve of good slopes downward from left to right like an ordinary demand curve, which depends upon price.

But the stock-supply curve of a good is parallel to the Y-axis because the total quantity of stock of a good is constant at a point of time. On the other hand, the flow-demand and supply curves are like the ordinary demand and supply curves which are influenced by current prices. But the price is neither a stock nor a flow variable because it does not need a time dimension. Nor is it a stock quantity. In fact, it is a ratio between the flow of cash and the flow of goods.

In Macroeconomics:

The concepts of stock and flow are used more in macroeconomics or in the theory of income, output, and employment. Money is a stock whereas the spending of money is a flow. Wealth is a stock and income is a flow. Saving by a person within a month is a flow while the total saving on a day is a stock. The government debt is a stock but the government deficit is a flow. The lending by a bank is a flow and its outstanding loan is a stock.

Some macro variables like imports, exports, wages, income, tax payments, social security benefits and dividends are always flows. Such flows do not have direct stocks but they can affect other stocks indirectly, just as imports can affect the stock of capital goods.

A stock can change due to flows but the size of flows can be determined itself by changes in stock. This can be explained by the relation between stock of capital and flow of investment. The stock of capital can only increase with the increase in the flow of investment, or by the difference between the flow of production of new capital goods and consumption of capital goods.

On the other hand, the flow of investment itself depends upon the size of capital stock. But the stocks can affect flows only if the time period is so long that the desired change in stock can be brought about. Thus, flows cannot be influenced by changes in stock in the short run.

Lastly, both the concepts of stock and flow variables are very important in modern theories of income, output, employment, interest rate, business cycles, etc.

Macroeconomic Models, Forecasting, and Policymaking

Models of the macroeconomy have gotten quite sophisticated, thanks to decades of development and advances in computing power. Such models have also become indispensable tools for monetary policymakers, useful both for forecasting and comparing different policy options. Their failure to predict the recent financial crisis does not negate their use, it only points to some areas that can be improved.

> “All models are false but some are useful”

Periods of economic and social crisis can easily turn into periods of change for economics as a profession. The dramatic financial crisis we experienced recently has caused economists to question the prevailing assumptions and standard approaches of the field. It is not the first time—the problems of the 1970s and 1930s had a similar effect on economic theory—and it surely will not be the last.

As we come to terms with why the crisis happened and why economists could not prevent or predict it, it is important to understand what was wrong with mainstream doctrine and

practice. It is likewise just as important to identify what was working fine. As the old saying goes, let's not throw the baby out with the bath water.

In this *Commentary*, we focus on one subset of economic theory and practice, the role of econometric models in the conduct of monetary policy. We review the development of different types of models commonly in use and highlight their successes and failures since the 1950s. In doing so, we also describe some of the common approaches that central banks use for forecasting and evaluating different policy scenarios.

Forecasting and Monetary Policy

Forecasting plays a vital role in the conduct of monetary policy. Policymakers need to predict the future direction of the economy before they can decide which policy to adopt. While, strictly speaking, they do not necessarily need an economic model to discuss where the economy is heading, the use of a model's forecast has the benefit of elevating that discussion to a scientific and systematic level. Models can be used to test different theories, for example, and they require forecasters to clearly spell out their underlying hypotheses.

But policymakers need forecasting tools that do more than project the likely path of important economic indicators like inflation, output, or unemployment. They need tools that can provide them with policy guidance—tools that help them determine the economic implications of monetary-policy changes. For example, what will the economy look like under the original monetary policy, and what will it look like after the change? For this reason, there has been an effort over the past 40 to 50 years to develop empirical forecasting models that are able to provide policymakers with this kind of guidance. Three broad categories of macroeconomic models have arisen during this time, each with its own strengths and weaknesses: structural, nonstructural, and large-scale models.

Structural models are built using the fundamental principles of economic theory, often at the expense of the model's ability to predict key macroeconomic variables like GDP, prices, or employment. In other words, economists who build structural models believe that they learn

more about economic processes from exploring the intricacies of economic theory than from closely matching incoming data.

Nonstructural models are primarily statistical time-series models—that is, they represent correlations of historical data. They incorporate very little economic structure, and this fact gives them enough flexibility to capture the force of history in the forecasts they generate. They intentionally "fudge" theory in an effort to more closely match economic data. The lack of economic structure makes them less useful in terms of interpreting the forecast, but at the same time, it makes them valuable in producing unconditional forecasts. That means that they generate the expected future paths of economic variables without imposing a path on any particular variable. These unconditional forecasts are typically accurate if the overall monetary policy regime does not change. Since policy regimes change infrequently, most forecasts from nonstructural models are useful.

The third category, large-scale models, is a kind of middle ground between the structural and nonstructural models. Such models are a hybrid; they are like nonstructural models in that they are built from many equations which describe relationships derived from empirical data. They are like structural models in that they also use economic theory, namely to limit the complexity of the equations. They are large, and their size brings pros and cons. One advantage is that relationships can be selected from a huge variety of data series, making it possible to provide a thorough description of the economic condition of interest. For instance, structural models rarely feature variables such as "car sales," while large-scale models often do. The main disadvantage is their complexity, which poses some limitations to their understanding and use.

Big Models Take Shape

The interest in developing large-scale forecasting models for policy purposes began in the 1960s at a time when Keynesian economic theory was very popular and advances in computer technology made their use feasible. Toward the end of the decade, the Federal Reserve Board developed its first version of a macro model for the U.S. economy called MPS (MIT, University of Pennsylvania, and Social Science Research Council). The Board began to use the model for

forecasting and policy analysis in 1970. In the initial version, MPS contained about 60 behavioral equations (equations that describe the behavior of economic variables). At the time, economists thought they had built a structural model. Soon they would find otherwise.

The initial optimism and momentum for building practical economic models was abruptly interrupted in the 1970s, a decade of great inflation and macroeconomic turbulence. The failure of economists to forecast high inflation and unemployment and to successfully address the economic troubles of the period produced a loss of faith in mainstream Keynesian theory and in the models that were the operative arm of that theory.

Disappointment came from realizing that the models that had been developed were not as structural as previously thought. Several flaws were identified, including assumptions about the behavior of prices and the overall modeling approach.

The models' greatest weakness was that they ignored the role that expectations play in influencing future economic events. The Fed's and other large-scale models were often used for conditional forecasting exercises, in which variables of interest are forecasted for a chosen monetary policy stance. Comparing scenarios shows the economic implications of different monetary policy stances. But since the models did not incorporate expectations, in particular about monetary and fiscal policies, they did not produce reliable conditional forecasts.

These weaknesses were clearly a drawback when turbulence hit the economy. In fact, when people are making decisions in periods of high uncertainty, they put a lot of emphasis on anticipating what policymakers will do. They can behave differently than they did in the past, which policymakers won't be able to predict if they're relying on models that merely capture historical behavior patterns and don't incorporate expectations.

The Nobel Prize winner Robert Lucas was one of the first economists to point out the pitfalls of underplaying the role of expectations, especially in relation to policy recommendations. He pointed out that the underlying parameters of the prevailing models—the

numerical constants embedded in the models that drove the forecasts—were not constant at all. They would change as policy changed or as expectations about policy changed, leaving policy conclusions based on these models completely unreliable. (The argument came to be called the Lucas critique.) The policy failures of the 1970s seemed to bear him out. Lucas called for models with deeper theoretical structures, and the economics profession heard him.

Development led next in two directions, one toward improving the existing large-scale models and the other toward further developing nonstructural forecasting models. The latter effort has led to the widespread use and success of vector auto-regression models (VARs).

The Fed continued to work on its large-scale models. It developed a multicountry model (MCM) to complement the MPS, and in the 1990s it developed a new set of models—FRB/US, FRB/MCM, and FRB/World. These new models still kept most of the underlying structural framework and the equilibrium relationships of the MPS and the MCM, but they also contained explicit specifications of forward-looking expectations and a more sophisticated representation of agents' decision making. Though they are not truly structural, they are still nevertheless the prime large-scale macro models (with over 250 behavioral equations) currently in use at the Fed. FRB/US is the most comprehensive model of the U.S. economy available anywhere.

The Dawn of DSGE Models

The rational expectations revolution of the 1970s created a temporary disconnect between academia and central banks. Economists at universities started working on developing a modeling framework that did not violate the Lucas critique. Monetary policymakers meanwhile continued to work with existing large-scale models since they were the only available framework for policy analysis. At the same time, they worked on improving those models by incorporating features advocated by Lucas and others, such as forward-looking expectations.

In a curious twist of fate, the disconnect was resolved by the rise of a new set of models, commonly known as DSGE (dynamic stochastic general equilibrium) models. The roots of

DSGE models can be traced back to real business cycle theory—a theory that left very little room for monetary policy actions.

Harvard's Gregory Mankiw explains what DSGE models are in his popular textbook. Paraphrasing, dynamic means the models "trace the path of variables over time" (since the decisions of households and businesses affect not only the current period but future periods as well); stochastic means the models incorporate techniques that account for the possibility of random economic events; and general equilibrium means that each model is built as a whole system and everything within the system depends on everything else (prices determine what people do, but what people do also determines prices).

Research on DSGE models has been going on at a significant pace since the 1980s, but only in the past few years have the models been used seriously for forecasting. While similar to large-scale models, DSGE models are different in that the latter have better microeconomic foundations: Household and firm behavior is modeled from first principles, while equations that relate macroeconomic variables (such as output, consumption, and investment) to each other are determined from the aggregation of the microeconomic equations.

The aggregation follows a strict bottom-up approach that goes from the micro to the macro level. This approach makes DSGE models better-suited to constructing conditional forecasts and comparing different policy scenarios.

DSGE models have a number of other advantages over large-scale models. They avoid the expectations problem that Lucas alerted everyone to. They incorporate a role for monetary policy, making them appealing to central banks. And finally, a technical advantage is that they can make use of the powerful solution methods of nonstructural models, given that their decision rules are usually well approximated by linear rules. The economist Francis Diebold described this aspect of DSGE models as "a marvelous union of modern macroeconomic theory and nonstructural times-series econometrics."

Model Shortfalls and the Future

Since DSGE models are technically very difficult to solve and analyze, they are much smaller in scale—usually featuring less than a hundred variables. They cannot easily incorporate the large array of high-frequency data usually available to policymakers.

Unfortunately, leaving some variables out may often lead to serious misspecification. For this reason, Princeton economist Christopher Sims characterizes DSGE models as useful story-telling devices that cannot yet replace large-scale models for forecasting purposes. On the other hand, Ben Bernanke, chairman of the Board of Governors of the Federal Reserve System, noted that DSGE models are "increasingly useful for policy analysis" and "likely to play a more significant role in the forecasting process over time....."

Economic forecasting models have come a long way since the 1970s, both the structural and nonstructural varieties. Most models, however, failed to predict the recent financial crisis. This failure may be partly attributed to the models' failure to fully incorporate the growing role of the financial sector or the worldwide financial and trade linkages that globalization has generated.

However, while the economics profession is currently trying to address those deficiencies, there is something intrinsic to economics that makes forecasting difficult. Contrary to the natural sciences, the social sciences do not have true invariants that can be used as scientific foundations. There is nothing like a "constant of gravity" in economics, which we can claim is really constant. This happens because the object that is studied and the observer are in continuous interaction, and those sorts of relationships have no easily predictable consequences.

It is unlikely that models will ever provide perfectly accurate forecasts. That is because forecasts are ultimately just another variable in the system, and it is impossible to restrain them from influencing other variables in the system. Once a forecast is revealed, the forecast itself can actually change people's behavior. In fact, the people who attend most closely to forecasts are the people whose behavior is most likely to affect the future course of the variables forecasted. In

the end, while policymakers would prefer better forecasts, policymakers' ultimate objective is better policy. And the lack of forecasting ability does not prevent models from being useful devices that can help policymakers in making decisions.

In this respect, the contribution that DSGE models have provided is mainly methodological, making them a useful complement to, but not a substitute for, large-scale macroeconomic models or nonstructural VARs. At the same time, they have given academic economists and central bank staff a base for a common language. In this respect, we believe DSGE models have had a success that cannot be judged by their inability to forecast the recent crisis.

UNIT II

National Income: Definition, Concepts and Methods of Measuring National Income

Introduction:

National income is an uncertain term which is used interchangeably with national dividend, national output and national expenditure. On this basis, national income has been defined in a number of ways. In common parlance, national income means the total value of goods and services produced annually in a country.

In other words, the total amount of income accruing to a country from economic activities in a year's time is known as national income. It includes payments made to all resources in the form of wages, interest, rent and profits.

1. Definitions of National Income:

The definitions of national income can be grouped into two classes: One, the traditional definitions advanced by Marshall, Pigou and Fisher; and two, modern definitions.

Marshallian Definition:

According to Marshall: "The labour and capital of a country acting on its natural resources produce annually a certain net aggregate of commodities, material and immaterial including services of all kinds. This is the true net annual income or revenue of the country or national dividend." In this definition, the word 'net' refers to deductions from the gross national income in respect of depreciation and wearing out of machines. And to this, must be added income from abroad.

It's Defects:

Though the definition advanced by Marshall is simple and comprehensive, yet it suffers from a number of limitations. First, in the present day world, so varied and numerous are the goods and services produced that it is very difficult to have a correct estimation of them.

Consequently, the national income cannot be calculated correctly. Second, there always exists the fear of the mistake of double counting, and hence the national income cannot be correctly estimated. Double counting means that a particular commodity or service like raw material or labour, etc. might get included in the national income twice or more than twice.

For example, a peasant sells wheat worth Rs.2000 to a flour mill which sells wheat flour to the wholesaler and the wholesaler sells it to the retailer who, in turn, sells it to the customers. If each time, this wheat or its flour is taken into consideration, it will work out to Rs.8000, whereas, in actuality, there is only an increase of Rs.2000 in the national income.

Third, it is again not possible to have a correct estimation of national income because many of the commodities produced are not marketed and the producer either keeps the produce for self-consumption or exchanges it for other commodities. It generally happens in an agriculture- oriented country like India. Thus the volume of national income is underestimated.

The Pigouvian Definition:

A.C. Pigou has in his definition of national income included that income which can be measured in terms of money. In the words of Pigou, “National income is that part of objective income of the community, including of course income derived from abroad which can be measured in money.”

This definition is better than the Marshallian definition. It has proved to be more practical also. While calculating the national income now-a- days, estimates are prepared in accordance with the two criteria laid down in this definition.

First, avoiding double counting, the goods and services which can be measured in money are included in national income. Second, income received on account of investment in foreign countries is included in national income.

It’s Defects:

The Pigouvian definition is precise, simple and practical but it is not free from criticism. First, in the light of the definition put forth by Pigou, we have to unnecessarily differentiate between commodities which can and which cannot be exchanged for money.

But, in actuality, there is no difference in the fundamental forms of such commodities, no matter they can be exchanged for money. Second, according to this definition when only such commodities as can be exchanged for money are included in estimation of national income, the national income cannot be correctly measured.

According to Pigou, a woman's services as a nurse would be included in national income but excluded when she worked in the home to look after her children because she did not receive any salary for it. Similarly, Pigou is of the view that if a man marries his lady secretary, the national income diminishes as he has no longer to pay for her services.

Thus the Pigovian definition gives rise to a number of paradoxes. Third, the Pigovian definition is applicable only to the developed countries where goods and services are exchanged for money in the market.

According to this definition, in the backward and underdeveloped countries of the world, where a major portion of the produce is simply bartered, correct estimate of national income will not be possible, because it will always work out less than the real level of income. Thus the definition advanced by Pigou has a limited scope.

Fisher's Definition:

Fisher adopted 'consumption' as the criterion of national income whereas Marshall and Pigou regarded it to be production. According to Fisher, "The National dividend or income consists solely of services as received by ultimate consumers, whether from their material or from the human environments. Thus, a piano, or an overcoat made for me this year is not a part of this year's income, but an addition to the capital. Only the services rendered to me during this year by these things are income."

Fisher's definition is considered to be better than that of Marshall or Pigou, because Fisher's definition provides an adequate concept of economic welfare which is dependent on consumption and consumption represents our standard of living.

It's Defects:

But from the practical point of view, this definition is less useful, because there are certain difficulties in measuring the goods and services in terms of money. First, it is more difficult to estimate the money value of net consumption than that of net production.

In one country there are several individuals who consume a particular good and that too at different places and, therefore, it is very difficult to estimate their total consumption in terms of money. Second, certain consumption goods are durable and last for many years.

If we consider the example of piano or overcoat, as given by Fisher, only the services rendered for use during one year by them will be included in income. If an overcoat costs Rs. 100 and lasts for ten years, Fisher will take into account only Rs. 100 as national income during one year, whereas Marshall and Pigou will include Rs. 100 in the national income for the year, when it is made.

Besides, it cannot be said with certainty that the overcoat will last only for ten years. It may last longer or for a shorter period. Third, the durable goods generally keep changing hands leading to a change in their ownership and value too.

It, therefore, becomes difficult to measure in money the service-value of these goods from the point of view of consumption. For instance, the owner of a Maruti car sells it at a price higher than its real price and the purchaser after using it for a number of years further sells it at its actual price.

Now the question is as to which of its price, whether actual or black market one, should we take into account, and afterwards when it is transferred from one person to another, which of its value according to its average age should be included in national income?

But the definitions advanced by Marshall, Pigou and Fisher are not altogether flawless. However, the Marshallian and Pigovian definitions tell us of the reasons influencing economic welfare, whereas Fisher's definition helps us compare economic welfare in different years.

Modern Definitions:

From the modern point of view, Simon Kuznets has defined national income as “the net output of commodities and services flowing during the year from the country’s productive system in the hands of the ultimate consumers.”

On the other hand, in one of the reports of United Nations, national income has been defined on the basis of the systems of estimating national income, as net national product, as addition to the shares of different factors, and as net national expenditure in a country in a year’s time. In practice, while estimating national income, any of these three definitions may be adopted, because the same national income would be derived, if different items were correctly included in the estimate.

2. Concepts of National Income:

There are a number of concepts pertaining to national income and methods of measurement relating to them.

(A) Gross Domestic Product (GDP):

GDP is the total value of goods and services produced within the country during a year. This is calculated at market prices and is known as GDP at market prices. Dernberg defines GDP at market price as “the market value of the output of final goods and services produced in the domestic territory of a country during an accounting year.”

There are three different ways to measure GDP:

Product Method, Income Method and Expenditure Method.

These three methods of calculating GDP yield the same result because National Product = National Income = National Expenditure.

1. The Product Method:

In this method, the value of all goods and services produced in different industries during the year is added up. This is also known as the value added method to GDP or GDP at factor cost by industry of origin. The following items are included in India in this: agriculture and allied services; mining; manufacturing, construction, electricity, gas and water supply; transport,

communication and trade; banking and insurance, real estates and ownership of dwellings and business services; and public administration and defense and other services (or government services). In other words, it is the sum of gross value added.

2. The Income Method:

The people of a country who produce GDP during a year receive incomes from their work. Thus GDP by income method is the sum of all factor incomes: Wages and Salaries (compensation of employees) + Rent + Interest + Profit.

3. Expenditure Method:

This method focuses on goods and services produced within the country during one year.

GDP by expenditure method includes:

(1) Consumer expenditure on services and durable and non-durable goods (C),

(2) Investment in fixed capital such as residential and non-residential building, machinery, and inventories (I),

(3) Government expenditure on final goods and services (G),

(4) Export of goods and services produced by the people of country (X),

(5) Less imports (M). That part of consumption, investment and government expenditure which is spent on imports is subtracted from GDP. Similarly, any imported component, such as raw materials, which is used in the manufacture of export goods, is also excluded.

Thus GDP by expenditure method at market prices = C+ I + G + (X – M), where (X-M) is net export which can be positive or negative.

(B) GDP at Factor Cost:

GDP at factor cost is the sum of net value added by all producers within the country. Since the net value added gets distributed as income to the owners of factors of production, GDP is the sum of domestic factor incomes and fixed capital consumption (or depreciation).

Thus GDP at Factor Cost = Net value added + Depreciation.

GDP at factor cost includes:

(i) Compensation of employees i.e., wages, salaries, etc.

(ii) Operating surplus which is the business profit of both incorporated and unincorporated firms. [Operating Surplus = Gross Value Added at Factor Cost—Compensation of Employees—Depreciation]

(iii) Mixed Income of Self- employed.

Conceptually, GDP at factor cost and GDP at market price must be identical/This is because the factor cost (payments to factors) of producing goods must equal the final value of goods and services at market prices. However, the market value of goods and services is different from the earnings of the factors of production.

In GDP at market price are included indirect taxes and are excluded subsidies by the government. Therefore, in order to arrive at GDP at factor cost, indirect taxes are subtracted and subsidies are added to GDP at market price.

Thus, GDP at Factor Cost = GDP at Market Price – Indirect Taxes + Subsidies.

(C) Net Domestic Product (NDP):

NDP is the value of net output of the economy during the year. Some of the country's capital equipment wears out or becomes obsolete each year during the production process. The value of this capital consumption is some percentage of gross investment which is deducted from GDP. Thus Net Domestic Product = GDP at Factor Cost – Depreciation.

(D) Nominal and Real GDP:

When GDP is measured on the basis of current price, it is called GDP at current prices or nominal GDP. On the other hand, when GDP is calculated on the basis of fixed prices in some year, it is called GDP at constant prices or real GDP.

Nominal GDP is the value of goods and services produced in a year and measured in terms of rupees (money) at current (market) prices. In comparing one year with another, we are faced with the problem that the rupee is not a stable measure of purchasing power. GDP may rise a great deal in a year, not because the economy has been growing rapidly but because of rise in prices (or inflation).

On the contrary, GDP may increase as a result of fall in prices in a year but actually it may be less as compared to the last year. In both 5 cases, GDP does not show the real state of the economy. To rectify the underestimation and overestimation of GDP, we need a measure that adjusts for rising and falling prices.

This can be done by measuring GDP at constant prices which is called real GDP. To find out the real GDP, a base year is chosen when the general price level is normal, i.e., it is neither too high nor too low. The prices are set to 100 (or 1) in the base year.

Now the general price level of the year for which real GDP is to be calculated is related to the base year on the basis of the following formula which is called the deflator index:

$$\text{Real } GDP = \frac{\text{GDP for the Current Year}}{} \times \frac{\text{Base Year (=100)}}{\text{Current Year Index}}$$

Suppose 1990-91 is the base year and GDP for 1999-2000 is Rs. 6, 00,000 crores and the price index for this year is 300.

Thus, Real GDP for 1999-2000 = Rs. 6, 00,000 x 100/300 = Rs. 2, 00,000 crores

(E) GDP Deflator:

GDP deflator is an index of price changes of goods and services included in GDP. It is a price index which is calculated by dividing the nominal GDP in a given year by the real GDP for the same year and multiplying it by 100. Thus,

$$GDP \text{ Deflator} = \frac{\text{Nominal (or Current Prices) } GDP}{\text{Real (or Constant Prices) } GDP} \times 100$$

$$\text{For example, GDP Deflator in 1997-98} = \frac{1426.7\text{th. crores}}{1049.2\text{th. crores at}} \times 100$$
$$= 135.9$$

It shows that at constant prices (1993-94), GDP in 1997-98 increased by 135.9% due to inflation (or rise in prices) from Rs. 1049.2 thousand crores in 1993-94 to Rs. 1426.7 thousand crores in 1997-98.

(F) Gross National Product (GNP):

GNP is the total measure of the flow of goods and services at market value resulting from current production during a year in a country, including net income from abroad.

GNP includes four types of final goods and services:

(1) Consumers' goods and services to satisfy the immediate wants of the people;

(2) Gross private domestic investment in capital goods consisting of fixed capital formation, residential construction and inventories of finished and unfinished goods;

(3) Goods and services produced by the government; and

(4) Net exports of goods and services, i.e., the difference between value of exports and imports of goods and services, known as net income from abroad.

In this concept of GNP, there are certain factors that have to be taken into consideration: First, GNP is the measure of money, in which all kinds of goods and services produced in a country during one year are measured in terms of money at current prices and then added together.

But in this manner, due to an increase or decrease in the prices, the GNP shows a rise or decline, which may not be real. To guard against erring on this account, a particular year (say for instance 1990-91) when prices be normal, is taken as the base year and the GNP is adjusted in accordance with the index number for that year. This will be known as GNP at 1990-91 prices or at constant prices.

Second, in estimating GNP of the economy, the market price of only the final products should be taken into account. Many of the products pass through a number of stages before they are ultimately purchased by consumers.

If those products were counted at every stage, they would be included many a time in the national product. Consequently, the GNP would increase too much. To avoid double counting, therefore, only the final products and not the intermediary goods should be taken into account.

Third, goods and services rendered free of charge are not included in the GNP, because it is not possible to have a correct estimate of their market price. For example, the bringing up of a child by the mother, imparting instructions to his son by a teacher, recitals to his friends by a musician, etc.

Fourth, the transactions which do not arise from the produce of current year or which do not contribute in any way to production are not included in the GNP. The sale and purchase of old goods, and of shares, bonds and assets of existing companies are not included in GNP because these do not make any addition to the national product, and the goods are simply transferred.

Fifth, the payments received under social security, e.g., unemployment insurance allowance, old age pension, and interest on public loans are also not included in GNP, because the recipients do not provide any service in lieu of them. But the depreciation of machines, plants and other capital goods is not deducted from GNP.

Sixth, the profits earned or losses incurred on account of changes in capital assets as a result of fluctuations in market prices are not included in the GNP if they are not responsible for current production or economic activity.

For example, if the price of a house or a piece of land increases due to inflation, the profit earned by selling it will not be a part of GNP. But if, during the current year, a portion of a house is constructed anew, the increase in the value of the house (after subtracting the cost of the newly constructed portion) will be included in the GNP. Similarly, variations in the value of assets, that can be ascertained beforehand and are insured against flood or fire, are not included in the GNP.

Last, the income earned through illegal activities is not included in the GNP. Although the goods sold in the black market are priced and fulfill the needs of the people, but as they are

not useful from the social point of view, the income received from their sale and purchase is always excluded from the GNP.

There are two main reasons for this. One, it is not known whether these things were produced during the current year or the preceding years. Two, many of these goods are foreign made and smuggled and hence not included in the GNP.

Three Approaches to GNP:

After having studied the fundamental constituents of GNP, it is essential to know how it is estimated. Three approaches are employed for this purpose. One, the income method to GNP; two, the expenditure method to GNP and three, the value added method to GNP. Since gross income equals gross expenditure, GNP estimated by all these methods would be the same with appropriate adjustments.

1. Income Method to GNP:

The income method to GNP consists of the remuneration paid in terms of money to the factors of production annually in a country.

Thus GNP is the sum total of the following items:

(i) Wages and salaries:

Under this head are included all forms of wages and salaries earned through productive activities by workers and entrepreneurs. It includes all sums received or deposited during a year by way of all types of contributions like overtime, commission, provident fund, insurance, etc.

(ii) Rents:

rent includes the rents of land, shop, house, factory, etc. and the estimated rents of all such assets as are used by the owners themselves.

(iii) Interest:

Under interest comes the income by way of interest received by the individual of a country from different sources. To this is added, the estimated interest on that private capital which is invested and not borrowed by the businessman in his personal business. But the interest

received on governmental loans has to be excluded, because it is a mere transfer of national income.

(iv) Dividends:

Dividends earned by the shareholders from companies are included in the GNP.

(v) Undistributed corporate profits:

Profits which are not distributed by companies and are retained by them are included in the GNP.

(vi) Mixed incomes:

These include profits of unincorporated business, self-employed persons and partnerships. They form part of GNP.

(vii) Direct taxes:

Taxes levied on individuals, corporations and other businesses are included in the GNP.

(viii) Indirect taxes:

The government levies a number of indirect taxes, like excise duties and sales tax.

These taxes are included in the price of commodities. But revenue from these goes to the government treasury and not to the factors of production. Therefore, the income due to such taxes is added to the GNP.

(ix) Depreciation:

Every corporation makes allowance for expenditure on wearing out and depreciation of machines, plants and other capital equipment. Since this sum also is not a part of the income received by the factors of production, it is, therefore, also included in the GNP.

(x) Net income earned from abroad:

This is the difference between the value of exports of goods and services and the value of imports of goods and services. If this difference is positive, it is added to the GNP and if it is negative, it is deducted from the GNP.

Thus GNP according to the Income Method = Wages and Salaries + Rents + Interest + Dividends + Undistributed Corporate Profits + Mixed Income + Direct Taxes + Indirect Taxes + Depreciation + Net Income from abroad.

2. Expenditure Method to GNP:

From the expenditure view point, GNP is the sum total of expenditure incurred on goods and services during one year in a country.

It includes the following items:

(i) Private consumption expenditure:

It includes all types of expenditure on personal consumption by the individuals of a country. It comprises expenses on durable goods like watch, bicycle, radio, etc., expenditure on single-used consumers' goods like milk, bread, ghee, clothes, etc., as also the expenditure incurred on services of all kinds like fees for school, doctor, lawyer and transport. All these are taken as final goods.

(ii) Gross domestic private investment:

Under this comes the expenditure incurred by private enterprise on new investment and on replacement of old capital. It includes expenditure on house construction, factory- buildings, and all types of machinery, plants and capital equipment.

In particular, the increase or decrease in inventory is added to or subtracted from it. The inventory includes produced but unsold manufactured and semi-manufactured goods during the year and the stocks of raw materials, which have to be accounted for in GNP. It does not take into account the financial exchange of shares and stocks because their sale and purchase is not real investment. But depreciation is added.

(iii) Net foreign investment:

It means the difference between exports and imports or export surplus. Every country exports to or imports from certain foreign countries. The imported goods are not produced within the country and hence cannot be included in national income, but the exported goods are manufactured within the country. Therefore, the difference of value between exports (X) and imports (M), whether positive or negative, is included in the GNP.

(iv) Government expenditure on goods and services:

The expenditure incurred by the government on goods and services is a part of the GNP. Central, state or local governments spend a lot on their employees, police and army. To run the offices, the governments have also to spend on contingencies which include paper, pen, pencil and various types of stationery, cloth, furniture, cars, etc.

It also includes the expenditure on government enterprises. But expenditure on transfer payments is not added, because these payments are not made in exchange for goods and services produced during the current year.

Thus GNP according to the Expenditure Method=Private Consumption Expenditure (C) + Gross Domestic Private Investment (I) + Net Foreign Investment (X-M) + Government Expenditure on Goods and Services (G) = C+ I + (X-M) + G.

As already pointed out above, GNP estimated by either the income or the expenditure method would work out to be the same, if all the items are correctly calculated.

3. Value Added Method to GNP:

Another method of measuring GNP is by value added. In calculating GNP, the money value of final goods and services produced at current prices during a year is taken into account. This is one of the ways to avoid double counting. But it is difficult to distinguish properly between a final product and an intermediate product.

For instance, raw materials, semi-finished products, fuels and services, etc. are sold as inputs by one industry to the other. They may be final goods for one industry and intermediate for others. So, to avoid duplication, the value of intermediate products used in manufacturing final products must be subtracted from the value of total output of each industry in the economy.

Thus, the difference between the value of material outputs and inputs at each stage of production is called the value added. If all such differences are added up for all industries in the economy, we arrive at the GNP by value added. GNP by value added = Gross value added + net income from abroad. Its calculation is shown in Tables 1, 2 and 3.

Table 1 is constructed on the supposition that the entire economy for purposes of total production consists of three sectors. They are agriculture, manufacturing, and others, consisting of the tertiary sector.

Out of the value of total output of each sector is deducted the value of its intermediate purchases (or primary inputs) to arrive at the value added for the entire economy. Thus the value of total output of the entire economy as per Table 1, is Rs. 155 crores and the value of its primary inputs comes to Rs. 80 crores. Thus the GDP by value added is Rs. 75 crores (Rs. 155 minus Rs. 80 crores).

TABLE 1 : GDP BY VALUE ADDED

(Rs. crores)

Industry	Total Output	Intermediate Purchases	Value Added
(1)	(2)	(3)	(4) = (2-3)
1. Agriculture	30	10	20
2. Manufacturing	70	45	25
3. Others	55	25	30
Total	155	80	75

The total value added equals the value of gross domestic product of the economy. Out of this value added, the major portion goes in the form wages and salaries, rent, interest and profits, a small portion goes to the government as indirect taxes and the remaining amount is meant for depreciation. This is shown in Table 3.

Thus we find that the total gross value added of an economy equals the value of its gross domestic product. If depreciation is deducted from the gross value added, we have net value added which comes to Rs. 67 crores (Rs. 75 minus Rs. 8 crores).

This is nothing but net domestic product at market prices. Again, if indirect taxes (Rs. 7 crores) are deducted from the net domestic product of Rs. 67 crores, we get Rs. 60 crores as the net value added at factor cost which is equivalent to net domestic product at factor cost. This is illustrated in Table 2.

TABLE 2
VALUE ADDED AT FACTOR COST

(Rs. Crores)

1.	Market Value of output	155
2.	*Less:* cost of intermediate Goods	80
3.	Gross value added	75
4.	*Less*: depreciation	8
5.	Net value added or domestic product at market prices	67
6.	*Less*: indirect taxes	7
7.	Net value added at factor cost	60

Net value added at factor cost is equal to the net domestic product at factor cost, as given by the total of items 1 to 4 of Table 2 (Rs. 45+3+4+8 crores=Rs. 60 crores). By adding indirect taxes (Rs 7 crores) and depreciation (Rs 8 crores), we get gross value added or GDP which comes to Rs 75 crores.

If we add net income received from abroad to the gross value added, this gives -us, gross national income. Suppose net income from abroad is Rs. 5 crores. Then the gross national income is Rs. 80 crores (Rs. 75 crores + Rs. 5 crores) as shown in Table 3.

TABLE 3 : GROSS DOMESTIC PRODUCT

(Rs Crores)

1.	Wages and salaries	45
2.	Income from rent	3
3.	Net interest	4
4.	Profits of companies	8
	Net Value Added or NDP	60
5.	Indirect taxes	+7
6.	Depreciation	+8
	Gross Value Added or GDP	75
7.	Net income from abroad	+5
Gross National Income		80

It's Importance:

The value added method for measuring national income is more realistic than the product and income methods because it avoids the problem of double counting by excluding the value of intermediate products. Thus this method establishes the importance of intermediate products in the national economy. Second, by studying the national income accounts relating to value added, the contribution of each production sector to the value of the GNP can be found out.

For instance, it can tell us whether agriculture is contributing more or the share of manufacturing is falling, or of the tertiary sector is increasing in the current year as compared to some previous years. Third, this method is highly useful because "it provides a means of checking the GNP estimates obtained by summing the various types of commodity purchases."

It's Difficulties:

However, difficulties arise in the calculation of value added in the case of certain public services like police, military, health, education, etc. which cannot be estimated accurately in money terms. Similarly, it is difficult to estimate the contribution made to value added by profits earned on irrigation and power projects.

(G) GNP at Market Prices:

When we multiply the total output produced in one year by their market prices prevalent during that year in a country, we get the Gross National Product at market prices. Thus GNP at market prices means the gross value of final goods and services produced annually in a country plus net income from abroad. It includes the gross value of output of all items from (1) to (4) mentioned under GNP. GNP at Market Prices = GDP at Market Prices + Net Income from Abroad.

(H) GNP at Factor Cost:

GNP at factor cost is the sum of the money value of the income produced by and accruing to the various factors of production in one year in a country. It includes all items mentioned above under income method to GNP less indirect taxes.

GNP at market prices always includes indirect taxes levied by the government on goods which raise their prices. But GNP at factor cost is the income which the factors of production receive in return for their services alone. It is the cost of production.

Thus GNP at market prices is always higher than GNP at factor cost. Therefore, in order to arrive at GNP at factor cost, we deduct indirect taxes from GNP at market prices. Again, it often happens that the cost of production of a commodity to the producer is higher than a price of a similar commodity in the market.

In order to protect such producers, the government helps them by granting monetary help in the form of a subsidy equal to the difference between the market price and the cost of production of the commodity. As a result, the price of the commodity to the producer is reduced and equals the market price of similar commodity.

For example if the market price of rice is Rs. 3 per kg but it costs the producers in certain areas Rs. 3.50. The government gives a subsidy of 50 paisa per kg to them in order to meet their cost of production. Thus in order to arrive at GNP at factor cost, subsidies are added to GNP at market prices.

GNP at Factor Cost = GNP at Market Prices – Indirect Taxes + Subsidies.

(I) Net National Product (NNP):

NNP includes the value of total output of consumption goods and investment goods. But the process of production uses up a certain amount of fixed capital. Some fixed equipment wears out, its other components are damaged or destroyed, and still others are rendered obsolete through technological changes.

All this process is termed depreciation or capital consumption allowance. In order to arrive at NNP, we deduct depreciation from GNP. The word ‘net’ refers to the exclusion of that part of total output which represents depreciation. So NNP = GNP—Depreciation.

(J) NNP at Market Prices:

Net National Product at market prices is the net value of final goods and services evaluated at market prices in the course of one year in a country. If we deduct depreciation from GNP at market prices, we get NNP at market prices. So NNP at Market Prices = GNP at Market Prices—Depreciation.

(K) NNP at Factor Cost:

Net National Product at factor cost is the net output evaluated at factor prices. It includes income earned by factors of production through participation in the production process such as wages and salaries, rents, profits, etc. It is also called National Income. This measure differs from NNP at market prices in that indirect taxes are deducted and subsidies are added to NNP at market prices in order to arrive at NNP at factor cost. Thus

NNP at Factor Cost = NNP at Market Prices – Indirect taxes+ Subsidies

= GNP at Market Prices – Depreciation – Indirect taxes + Subsidies.

= National Income.

Normally, NNP at market prices is higher than NNP at factor cost because indirect taxes exceed government subsidies. However, NNP at market prices can be less than NNP at factor cost when government subsidies exceed indirect taxes.

(L) Domestic Income:

Income generated (or earned) by factors of production within the country from its own resources is called domestic income or domestic product.

Domestic income includes:

(i) Wages and salaries,

(ii) rents, including imputed house rents,

(iii) interest,

(iv) dividends,

(v) undistributed corporate profits, including surpluses of public undertakings,

(vi) mixed incomes consisting of profits of unincorporated firms, self- employed persons, partnerships, etc., and

(vii) direct taxes.

Since domestic income does not include income earned from abroad, it can also be shown as: Domestic Income = National Income-Net income earned from abroad. Thus the difference between domestic income f and national income is the net income earned from abroad. If we add net income from abroad to domestic income, we get national income, i.e., National Income = Domestic Income + Net income earned from abroad.

But the net national income earned from abroad may be positive or negative. If exports exceed import, net income earned from abroad is positive. In this case, national income is greater than domestic income. On the other hand, when imports exceed exports, net income earned from abroad is negative and domestic income is greater than national income.

(M) Private Income:

Private income is income obtained by private individuals from any source, productive or otherwise, and the retained income of corporations. It can be arrived at from NNP at Factor Cost by making certain additions and deductions.

The additions include transfer payments such as pensions, unemployment allowances, sickness and other social security benefits, gifts and remittances from abroad, windfall gains from lotteries or from horse racing, and interest on public debt. The deductions include income from government departments as well as surpluses from public undertakings, and employees' contribution to social security schemes like provident funds, life insurance, etc.

Thus Private Income = National Income (or NNP at Factor Cost) + Transfer Payments + Interest on Public Debt — Social Security — Profits and Surpluses of Public Undertakings.

(N) Personal Income:

Personal income is the total income received by the individuals of a country from all sources before payment of direct taxes in one year. Personal income is never equal to the national income, because the former includes the transfer payments whereas they are not included in national income.

Personal income is derived from national income by deducting undistributed corporate profits, profit taxes, and employees' contributions to social security schemes. These three components are excluded from national income because they do reach individuals.

But business and government transfer payments, and transfer payments from abroad in the form of gifts and remittances, windfall gains, and interest on public debt which are a source of income for individuals are added to national income. Thus Personal Income = National Income – Undistributed Corporate Profits – Profit Taxes – Social Security Contribution + Transfer Payments + Interest on Public Debt.

Personal income differs from private income in that it is less than the latter because it excludes undistributed corporate profits.

Thus Personal Income = Private Income – Undistributed Corporate Profits – Profit Taxes.

(O) Disposable Income:

Disposable income or personal disposable income means the actual income which can be spent on consumption by individuals and families. The whole of the personal income cannot be spent on consumption, because it is the income that accrues before direct taxes have actually been paid. Therefore, in order to obtain disposable income, direct taxes are deducted from personal income. Thus Disposable Income=Personal Income – Direct Taxes.

But the whole of disposable income is not spent on consumption and a part of it is saved. Therefore, disposable income is divided into consumption expenditure and savings. Thus Disposable Income = Consumption Expenditure + Savings.

If disposable income is to be deduced from national income, we deduct indirect taxes plus subsidies, direct taxes on personal and on business, social security payments, undistributed

corporate profits or business savings from it and add transfer payments and net income from abroad to it.

Thus Disposable Income = National Income – Business Savings – Indirect Taxes + Subsidies – Direct Taxes on Persons – Direct Taxes on Business – Social Security Payments + Transfer Payments + Net Income from abroad.

(P) Real Income:

Real income is national income expressed in terms of a general level of prices of a particular year taken as base. National income is the value of goods and services produced as expressed in terms of money at current prices. But it does not indicate the real state of the economy.

It is possible that the net national product of goods and services this year might have been less than that of the last year, but owing to an increase in prices, NNP might be higher this year. On the contrary, it is also possible that NNP might have increased but the price level might have fallen, as a result national income would appear to be less than that of the last year. In both the situations, the national income does not depict the real state of the country. To rectify such a mistake, the concept of real income has been evolved.

In order to find out the real income of a country, a particular year is taken as the base year when the general price level is neither too high nor too low and the price level for that year is assumed to be 100. Now the general level of prices of the given year for which the national income (real) is to be determined is assessed in accordance with the prices of the base year. For this purpose the following formula is employed.

Real NNP = NNP for the Current Year x Base Year Index (=100) / Current Year Index

Suppose 1990-91 is the base year and the national income for 1999-2000 is Rs. 20,000 crores and the index number for this year is 250. Hence, Real National Income for 1999-2000 will be = 20000 x 100/250 = Rs. 8000 crores. This is also known as national income at constant prices.

(Q) Per Capita Income:

The average income of the people of a country in a particular year is called Per Capita Income for that year. This concept also refers to the measurement of income at current prices and at constant prices. For instance, in order to find out the per capita income for 2001, at current prices, the national income of a country is divided by the population of the country in that year.

$$\text{Per Capita Income for 2001} = \frac{\textit{National income} \text{ for 2001}}{\textit{Population in} \text{ 2001}}$$

Similarly, for the purpose of arriving at the Real Per Capita Income, this very formula is used.

$$\text{Real Per Capita Income for 2001} = \frac{\textit{Real national income} \text{ for 2001}}{\textit{Population in} \text{ 2001}}$$

This concept enables us to know the average income and the standard of living of the people. But it is not very reliable, because in every country due to unequal distribution of national income, a major portion of it goes to the richer sections of the society and thus income received by the common man is lower than the per capita income.

3. Methods of Measuring National Income:

There are four methods of measuring national income. Which method is to be used depends on the availability of data in a country and the purpose in hand.

(1) Product Method:

According to this method, the total value of final goods and services produced in a country during a year is calculated at market prices. To find out the GNP, the data of all productive activities, such as agricultural products, wood received from forests, minerals received from mines, commodities produced by industries, the contributions to production made by transport, communications, insurance companies, lawyers, doctors, teachers, etc. are collected and assessed at market prices. Only the final goods and services are included and the intermediary goods and services are left out.

(2) Income Method:

According to this method, the net income payments received by all citizens of a country in a particular year are added up, i.e., net incomes that accrue to all factors of production by way of net rents, net wages, net interest and net profits are all added together but incomes received in the form of transfer payments are not included in it. The data pertaining to income are obtained from different sources, for instance, from income tax department in respect of high income groups and in case of workers from their wage bills.

(3) Expenditure Method:

According to this method, the total expenditure incurred by the society in a particular year is added together and includes personal consumption expenditure, net domestic investment, government expenditure on goods and services, and net foreign investment. This concept is based on the assumption that national income equals national expenditure.

(4) Value Added Method:

Another method of measuring national income is the value added by industries. The difference between the value of material outputs and inputs at each stage of production is the value added. If all such differences are added up for all industries in the economy, we arrive at the gross domestic product.

4. Difficulties or Limitations in Measuring National Income:

There are many conceptual and statistical problems involved in measuring national income by the income method, product method, and expenditure method.

We discuss them separately in the light of the three methods:

(A) Problems in Income Method:

The following problems arise in the computation of National Income by income method:

1. Owner-occupied Houses:

A person who rents a house to another earns rental income, but if he occupies the house himself, will the services of the house-owner be included in national income. The services of the

owner-occupied house are included in national income as if the owner sells to himself as a tenant its services.

For the purpose of national income accounts, the amount of imputed rent is estimated as the sum for which the owner-occupied house could have been rented. The imputed net rent is calculated as that portion of the amount that would have accrued to the house-owner after deducting all expenses.

2. Self-employed Persons:

Another problem arises with regard to the income of self-employed persons. In their case, it is very difficult to find out the different inputs provided by the owner himself. He might be contributing his capital, land, labour and his abilities in the business. But it is not possible to estimate the value of each factor input to production. So he gets a mixed income consisting of interest, rent, wage and profits for his factor services. This is included in national income.

3. Goods meant for Self-consumption:

In under-developed countries like India, farmers keep a large portion of food and other goods produced on the farm for self-consumption. The problem is whether that part of the produce which is not sold in the market can be included in national income or not. If the farmer were to sell his entire produce in the market, he will have to buy what he needs for self-consumption out of his money income. If, instead he keeps some produce for his self-consumption, it has money value which must be included in national income.

4. Wages and Salaries paid in Kind:

Another problem arises with regard to wages and salaries paid in kind to the employees in the form of free food, lodging, dress and other amenities. Payments in kind by employers are included in national income. This is because the employees would have received money income equal to the value of free food, lodging, etc. from the employer and spent the same in paying for food, lodging, etc.

(B) Problems in Product Method:

The following problems arise in the computation of national income by product method:

1. Services of Housewives:

The estimation of the unpaid services of the housewife in the national income presents a serious difficulty. A housewife renders a number of useful services like preparation of meals, serving, tailoring, mending, washing, cleaning, bringing up children, etc.

She is not paid for them and her services are not including in national income. Such services performed by paid servants are included in national income. The national income is, therefore, underestimated by excluding the services of a housewife.

The reason for the exclusion of her services from national income is that the love and affection of a housewife in performing her domestic work cannot be measured in monetary terms. That is why when the owner of a firm marries his lady secretary, her services are not included in national income when she stops working as a secretary and becomes a housewife.

When a teacher teaches his own children, his work is also not included in national income. Similarly, there are a number of goods and services which are difficult to be assessed in money terms for the reason stated above, such as painting, singing, dancing, etc. as hobbies.

2. Intermediate and Final Goods:

The greatest difficulty in estimating national income by product method is the failure to distinguish properly between intermediate and final goods. There is always the possibility of including a good or service more than once, whereas only final goods are included in national income estimates. This leads to the problem of double counting which leads to the overestimation of national income.

3. Second-hand Goods and Assets:

Another problem arises with regard to the sale and purchase of second-hand goods and assets. We find that old scooters, cars, houses, machinery, etc. are transacted daily in the country. But they are not included in national income because they were counted in the national product in the year they were manufactured.

If they are included every time they are bought and sold, national income would increase many times. Similarly, the sale and purchase of old stocks, shares, and bonds of companies are not included in national income because they were included in national income when the companies were started for the first time. Now they are simply financial transactions and represent claims.

But the commission or fees charged by the brokers in the repurchase and resale of old shares, bonds, houses, cars or scooters, etc. are included in national income. For these are the payments they receive for their productive services during the year.

4. Illegal Activities:

Income earned through illegal activities like gambling, smuggling, illicit extraction of wine, etc. is not included in national income. Such activities have value and satisfy the wants of the people but they are not considered productive from the point of view of society. But in countries like Nepal and Monaco where gambling is legalised, it is included in national income. Similarly, horse-racing is a legal activity in England and is included in national income.

5. Consumers' Service:

There are a number of persons in society who render services to consumers but they do not produce anything tangible. They are the actors, dancers, doctors, singers, teachers, musicians, lawyers, barbers, etc. The problem arises about the inclusion of their services in national income since they do not produce tangible commodities. But as they satisfy human wants and receive payments for their services, their services are included as final goods in estimating national income.

6. Capital Gains:

The problem also arises with regard to capital gains. Capital gains arise when a capital asset such as a house, some other property, stocks or shares, etc. is sold at higher price than was paid for it at the time of purchase. Capital gains are excluded from national income because these do not arise from current economic activities. Similarly, capital losses are not taken into account while estimating national income.

7. Inventory Changes:

All inventory changes (or changes in stocks) whether positive or negative are included in national income. The procedure is to take changes in physical units of inventories for the year valued at average current prices paid for them.

The value of changes in inventories may be positive or negative which is added or subtracted from the current production of the firm. Remember, it is the change in inventories and not total inventories for the year that are taken into account in national income estimates.

8. Depreciation:

Depreciation is deducted from GNP in order to arrive at NNP. Thus depreciation lowers the national income. But the problem is of estimating the current depreciated value of, say, a machine, whose expected life is supposed to be thirty years. Firms calculate the depreciation value on the original cost of machines for their expected life. This does not solve the problem because the prices of machines change almost every year.

9. Price Changes:

National income by product method is measured by the value of final goods and services at current market prices. But prices do not remain stable. They rise or fall. When the price level rises, the national income also rises, though the national production might have fallen.

On the contrary, with the fall in the price level, the national income also falls, though the national production might have increased. So price changes do not adequately measure national income. To solve this problem, economists calculate the real national income at a constant price level by the consumer price index.

(C) Problems in Expenditure Method:

The following problems arise in the calculation of national income by expenditure method:

(1) Government Services:

In calculating national income by, expenditure method, the problem of estimating government services arises. Government provides a number of services, such as police and

military services, administrative and legal services. Should expenditure on government services be included in national income?

If they are final goods, then only they would be included in national income. On the other hand, if they are used as intermediate goods, meant for further production, they would not be included in national income. There are many divergent views on this issue.

One view is that if police, military, legal and administrative services protect the lives, property and liberty of the people, they are treated as final goods and hence form part of national income. If they help in the smooth functioning of the production process by maintaining peace and security, then they are like intermediate goods that do not enter into national income.

In reality, it is not possible to make a clear demarcation as to which service protects the people and which protects the productive process. Therefore, all such services are regarded as final goods and are included in national income.

(2) Transfer Payments:

There arises the problem of including transfer payments in national income. Government makes payments in the form of pensions, unemployment allowance, subsidies, interest on national debt, etc. These are government expenditures but they are not included in national income because they are paid without adding anything to the production process during the current year.

For instance, pensions and unemployment allowances are paid to individuals by the government without doing any productive work during the year. Subsidies tend to lower the market price of the commodities. Interest on national or public debt is also considered a transfer payment because it is paid by the government to individuals and firms on their past savings without any productive work.

(3) Durable-use Consumers' Goods:

Durable-use consumers' goods also pose a problem. Such durable-use consumers' goods as scooters, cars, fans, TVs, furniture's, etc. are bought in one year but they are used for a number of years. Should they be included under investment expenditure or consumption

expenditure in national income estimates? The expenditure on them is regarded as final consumption expenditure because it is not possible to measure their used up value for the subsequent years.

But there is one exception. The expenditure on a new house is regarded as investment expenditure and not consumption expenditure. This is because the rental income or the imputed rent which the house-owner gets is for making investment on the new house. However, expenditure on a car by a household is consumption expenditure. But if he spends the amount for using it as a taxi, it is investment expenditure.

(4) Public Expenditure:

Government spends on police, military, administrative and legal services, parks, street lighting, irrigation, museums, education, public health, roads, canals, buildings, etc. The problem is to find out which expenditure is consumption expenditure and which investment expenditure is.

Expenses on education, museums, public health, police, parks, street lighting, civil and judicial administration are consumption expenditure. Expenses on roads, canals, buildings, etc. are investment expenditure. But expenses on defence equipment are treated as consumption expenditure because they are consumed during a war as they are destroyed or become obsolete. However, all such expenses including the salaries of armed personnel are included in national income.

5. Importance of National Income Analysis:

The national income data have the following importance:

1. For the Economy:

National income data are of great importance for the economy of a country. These days the national income data are regarded as accounts of the economy, which are known as social accounts. These refer to net national income and net national expenditure, which ultimately equal each other.

Social accounts tell us how the aggregates of a nation's income, output and product result from the income of different individuals, products of industries and transactions of international trade. Their main constituents are inter-related and each particular account can be used to verify the correctness of any other account.

2. National Policies:

National income data form the basis of national policies such as employment policy, because these figures enable us to know the direction in which the industrial output, investment and savings, etc. change, and proper measures can be adopted to bring the economy to the right path.

3. Economic Planning:

In the present age of planning, the national data are of great importance. For economic planning, it is essential that the data pertaining to a country's gross income, output, saving and consumption from different sources should be available. Without these, planning is not possible.

4. Economic Models:

The economists propound short-run as well as long-run economic models or long-run investment models in which the national income data are very widely used.

5. Research:

The national income data are also made use of by the research scholars of economics. They make use of the various data of the country's input, output, income, saving, consumption, investment, employment, etc., which are obtained from social accounts.

6. Per Capita Income:

National income data are significant for a country's per capita income which reflects the economic welfare of the country. The higher the per capita income, the higher the economic welfare of the country.

7. Distribution of Income:

National income statistics enable us to know about the distribution of income in the country. From the data pertaining to wages, rent, interest and profits, we learn of the disparities in the incomes of different sections of the society. Similarly, the regional distribution of income is revealed.

It is only on the basis of these that the government can adopt measures to remove the inequalities in income distribution and to restore regional equilibrium. With a view to removing these personal and regional disequibria, the decisions to levy more taxes and increase public expenditure also rest on national income statistics.

6. Inter-Relationship among different concept of National Income

The inter-relationship among the various concept of national income can be shown in the form of equations as under:

1.	Gross National Product (GNP)	= Gross National Expenditure (GNE)
2.	Gross Domestic Product (GDP)	= GNP – Net Income from abroad.
3.	GNP at Market Prices	= GNP at Factor Cost + Indirect Taxes – Subsidies
4.	NNP at Market Prices	= GNP at Market Prices – Depreciation or Capital Consumption Allowance
5.	Net Domestic Product (NDP) at Market Prices	= NNP at Market Prices – Net Factor Income from abroad
6.	NNP at Factor Cost or National Income or National Product	= NNP at Market Prices – Indirect Taxes + Subsidies
7.	NDP at Factor Cost or Domestic Income or Domestic Product	= National Income – Net Factor Income from abroad
8.	Private Income	= NNP at Factor Cost + Government and Business Transfer Payments + Current Transfers from abroad in the form of Gifts and Remittances + Windfall Gains + Net Factor Income from abroad + Interest on Public Debt and Consumer Interest – Social Security Contribution – Income from Government Departments and property – Profits and Surpluses of Public Corporations (or Undertakings) Or = Income from Domestic Product accruing to Private Sector + Interest on Public Dept + Net Factor Income from abroad + Transfer Payments + Current Transfers from the rest of the world (or abroad)
9.	Income from Domestic Product accruing to Private Sector	NDP at Factor Cost – Income from = Domestic Product accruing to Government Departments – Saving of Non-Departmental Enterprises.
10.	Personal Income	= Private Income – Saving of Private Corporate Sector (or Undistributed Corporate Profits) – Corporation Tax (or Profit Taxes)
11.	Personal Disposable Income or Disposable Income	= Personal Income – Direct Taxes paid by Households (or Direct Personal Taxes) and Miscellaneous Fees, Fines, etc. Or = NDP at Factor Cost + Transfer Payments + Net Factor Income from abroad – Corporation Tax – Undistributed Corporate Profits – Social Security Payments – Direct Personal Taxes Or = National Income at Factor Cost + Transfer Payments + Net Income from abroad – Corporate Tax – undistributed Corporate Profits – Social Security payments – Direct Personal Taxes – Indirect Taxes + Subsidies.

Circular Flow of Income

Circular Flow of Income Definition

Circular flow of income is an economic model that describes how the money exchanged in the process of production, distribution and consumption of goods and services flows in a circular manner from producers to consumers and back to the producers.

- Circular flow of income refers to the economic model describing the circular movement of money between Firms/Producers and households. Such a model is also called a two-sector economy, as it only considers two sectors, household and firms.
- In the real world, many additional players like the government, national income and foreign markets are taken into account. This drastically increases the complexity, but the end result still is a circular flow of income.
- To overcome the drawbacks of the two-sector economy, other models are used as a reference to understand the flow of money at the macro level. These models are a three-sector model of economy and four-sector model of the economy.

Diagram of the Circular Flow of Income

The circular flow of income is an integral concept in economics as it describes the foundation of the transactions that build an economy. The basic model of the circular flow of income considers only two sectors, the firms and the households, which is why it is called the two-sector economy model.

Let understand the meaning of these terms as well as the whole concept in simple steps.

- Firms are the producers of goods and services. Firms require various factors of production or societal resources to produce goods and services.
- The factors of production are land, labor, building, stock, stationery, etc.
- Households provide the resources or factors of production. For example, a household provides land and labor to carry out business operations in exchange for the money paid in the form of rent, wages, etc.

- So, the money flows from the firms to the household in the form of rent, wages, etc.
- The households utilize the money from wages and rent to purchase certain goods and services to full their needs and wants.
- When the households pay for these goods and services, the money flows back to the firms, completing the circular movement of money.

Example

We can take the example of a Nutella factory to explain the circular flow of income.

- Here, the Nutella factory is the firm which is the producer of jars of Nutella spread. Some of the factors of production include cocoa beans, land for housing the factory, the building, and laborers for carrying out the production process.

The household that has rented out it land to establish the factory will enjoy heavy monetary compensation or rent in exchange. Simultaneously, the labor will be

- compensated with wages in exchange for their hard work to produce jars of the chocolate spread.
- The logistics team will be paid further for delivering the Nutella jars to stores and e-commerce warehouses.
- The household will purchase the Nutella jar utilizing the money it earned as wages or rent.
- When households pay for the Nutella Jars, the money will reach the factory owners, completing the money's circular flow.
- It is important to note that the economy is running on several thriving circular movements of money. Obviously, the above example is simplistic.

For a macro-level understanding, the two-sector model is not sufficient as many complex factors are not considered to explain the flow of income and expenditure. The factors include national income, the role of the government, foreign trade and the like. Two and Three sectors of economy model respectively look at such issues.

1. There is no government to interfere in the money flow, i.e. there is no tax liability on the households or regulations imposed on the movement.

2. It assumes that it is a closed economy without any external interference of foreign countries, i.e. there is no trade foreign trade.

Let us make in-depth study of the circular flow of income in two sector, three sector and four sector economy.

Circular Income Flow in a Two Sector Economy:

as land, capital and entrepreneurial ability flow from households to business firms as indicated by the arrow mark.

In opposite direction to this, money flows from business firms to the households as factor payments such as wages, rent, interest and profits.

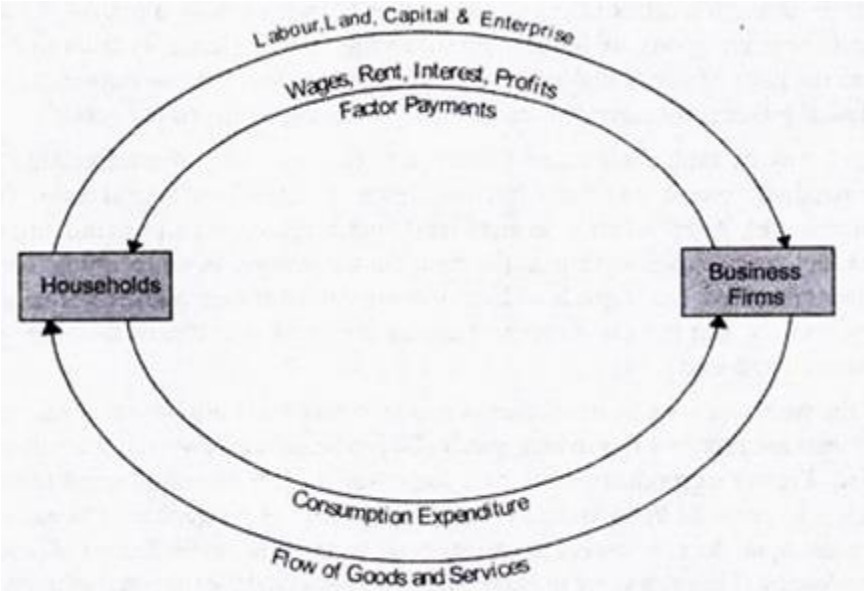


Fig. 6.1. *Circular Flow of Income in a Simple Two Sector Economy*

In the lower part of the figure, money flows from households to firms as consumption expenditure made by the households on the goods and services produced by the firms, while the flow of goods and services is in opposite direction from business firms to households.

Thus we see that money flows from business firms to households as factor payments and then it flows from households to firms. Thus there is, in fact, a circular flow of money or income. This circular flow of money will continue indefinitely week by week and year by year. This is

how the economy functions. It may, however, be pointed out that this flow of money income will not always remain the same in volume.

In other words, the flow of money income will not always continue at a constant level. In year of depression, the circular flow of money income will contract, i.e., will become lesser in volume, and in years of prosperity it will expand, i.e., will become greater in volume.

This is so because the flow of money is a measure of national income and will, therefore, change with changes in the national income. In year of depression, when national income is low, the volume of the flow of money will be small and in years of prosperity when the level of national income is quite high, the flow of money will be large.

In order to make our analysis simple and to explain the central issues involved, we take many assumptions. In the first place, we assume that neither the households save from their incomes, nor the firms save from their profits. We further assume that the government does not play any part in the national economy.

In other words, the government does not receive any money from the people by way of taxes, nor does the government spend any money on the goods and services produced by the firms or on the resources and services supplied by the households. Thirdly, we assume that the economy neither imports goods and services, nor exports anything. In other words, in our above analysis we have not taken into account the role of foreign trade. In fact we have explained above the flow of money that occurs in the functioning of a closed economy with no savings and no role of government.

Circular Income Flow with Saving and Investment:

In our above analysis of the circular flow of income we have assumed that all income which the households receive, they spend it on consumer goods and services. A result, circular flow of money speeding and income remains undiminished. We will now explain if households save a part of their income, how their savings will affect money flows in the economy.

When households save, their expenditure on goods and services will decline to that extent and as a result money flow to the business firms will contract. With reduced money receipts,

firms will hire fewer workers (or lay off some workers) or reduce the factor payments they make to the suppliers of factors such as workers.

This will lead to the fall in total incomes of the households. Thus, savings reduce the flow of money expenditure to the business firms and will cause a fall in economy's total income. Economists therefore call savings a leakage from the money expenditure flow.

But savings by households need not lead to reduced aggregate spending and income if they find their way back into flow of expenditure. In free market economies there exists a set of institutions such as banks, insurance companies, financial houses, stock markets where households deposit their savings. All these institutions together are called financial institutions or financial market. We assume that all the savings of households come in the financial market. We further assume that there are no inter-households borrowings.

It is business firms who borrow from the financial market for investment in capital goods such as machines, factories, tools and instruments, trucks. Firms spend on investment in order to expand their productive capacity in future.

Thus, through investment expenditure by borrowing the savings of the households deposited in financial market, are again brought into the expenditure stream and as a result total flow of spending does not decrease. Circular money flow with saving and investment is illustrated in Fig. 6.2 where in the middle part a box representing financial market is drawn. Money flow of savings is shown from the households towards the financial market. Then flow of investment expenditure is shown as borrowing by business firms from the financial market.

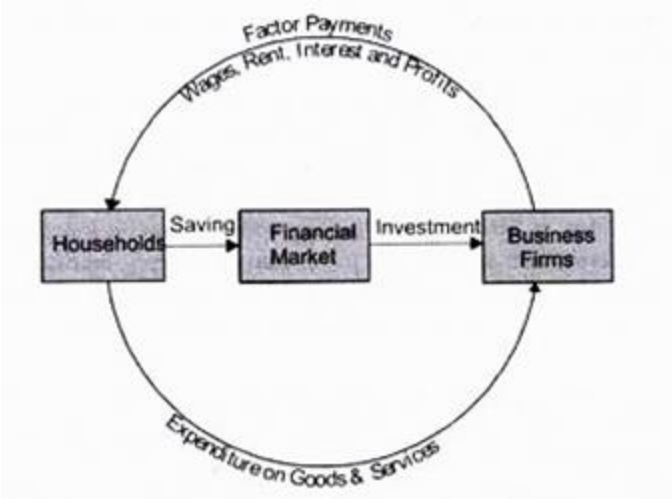


Fig. 6.2. *Circular Money Flow with Saving and Investment*

Condition for the Constancy of Circular Income Flow:

Now the question arises what is the condition for the flow of money income to continue at a steady level so that it makes possible the production and subsequent flow of a given volume of goods and services at constant prices. To explain this we have to introduce saving and investment in the analysis of circular flow of income.

Saving a part of income means it is not spent on consumer goods and services. In other words, saving is withdrawal of some money from the income flow. On the other hand, investment means some money is spent on buying new capital goods to expand production capacity. In other words, investment is injection of some money in circular flow of income.

For the circular flow of income to continue unabated, the withdrawal of money from the income stream by way of saving must equal injection of money by way of investment expenditure. Therefore, planned savings must be equal to planned investment if the constant money income flow in an economy is to be obtained.

Now, what will happen if planned investment expenditure falls short of the planned savings? As a result of fall in planned investment expenditure, income, output and employment will fall and therefore the flow of money will contract.

If the equality between planned savings and planned investment is disturbed by increase in savings, then the immediate effect will be that the stocks of goods lying in the shelves of the

shops will increase (as some of the goods will not be sold due to the fall in consumption i.e., increase in savings). Owing to the deficiency of demand for goods and the accumulation of stocks, retailers will place small orders with the wholesalers. Consequently, smaller amount of goods will be produced and therefore fewer capital goods like machinery will be indeed with the result that fixed investment will tend to fall.

Thus the ultimate effect of either the fall in planned investment or the increase in planned savings is the same, namely, the fall in income, output, employment and prices with the result that the flow of money will contract.

On the other hand, if the equality between planned savings and planned investment is disturbed by the increase in investment demand, the result will be increase in income, output and employment. Consequently, the flow of money income will expand.

It is thus clear from the above analysis that the flow of money income will continue at a constant level only when the condition of equality between planned saving and investment is satisfied. It was believed by classical economists that financial market provides a mechanism which coordinates the savings of households and the investment expenditure, by the firms. Rate of interest, which is the price for the use of savings, is determined by saving and investment.

If savings exceed investment expenditure, rate of interest falls so that, at a lower rate of interest, investment increases and both become equal. On the contrary, if investment expenditure is greater than savings, rate of interest will rise so that at a higher rate of interest savings increase and become equal to planned investment expenditure.

However, an eminent British economist J.M. Keynes refuted the above argument that changes in rate of interest will cause saving and investment to become equal. According to him, since in a free market capitalist economy, investment is made by business enterprises and savings are mostly done by households and for different reasons, there is no guarantee that planned investment will be equal to planned savings and thus fluctuations in income, output and employment are inevitable.

As a result, circular flow of income does not continue at a steady level in a free-enterprise capitalist economy unless certain corrective and preventive steps are taken by the government to maintain stability in the economy.

Saving-Investment Identity in National Income Accounts in a Two Sector Economy:

Despite the fact that people who save are different from the business firms which primarily invest, in national income accounts savings are identical or always equal to investment in a simple two sector economy having no roles of Government and foreign trade. This is a basic identity in national income accounts which needs to be carefully understood.

Of course, in our above analysis of circular flow of income, we explained that planned investment by business firms can differ from savings by household. But in that analysis we referred to planned or intended investment and savings which often differ and affect the flow of national income.

However, in national income accounts we are concerned with actual saving and actual investment. It is these actual or realised saving and investment that are identical in national income accounts. We can prove their identity in the following way.

In a simple economy which has neither government, nor foreign trade, the value of output produced which we denote by Y is equal to the value of output sold. Since the value of output sold in a simple two sector economy is equal to the sum of consumption expenditure and investment expenditure we have y= C+ I where Y = Value of aggregate output, C = Consumption expenditure and I = Investment expenditure.

A pertinent question which arises here is what happens to the unsold output. The unsold output leads to the increase in the inventories of goods and in national income accounting increase in inventories of goods is treated as a part of actual investment. This may be considered as the firms selling the goods to themselves to add to their inventories. Thus, gross national product (GNP) produced is used either for consumption or for investment.

Now, look at the gross national product or income in the simple economy from the viewpoint of its allocation between consumption and saving. Since national income (which is equal to GNP) can be either consumed or saved,. We have Y Ξ C+ S

From the identities (i) and (ii) we get

C+ I Ξ Y Ξ C+ S

The left hand side of the identity (iii), namely C + I = Y shows the components of aggregate demand (that is, aggregate expenditure on goods and services produced) and the right-hand side of the identity (iii) namely Y = C + S shows the allocation of national income to either consumption or saving. Thus, the identity (iii) shows that the value of output produced or sold is equal to the total income received. It is income received that is spent on goods and services produced.

Now subtracting the consumption (C) from both sides of the identity (iii) we have

I Ξ Y Ξ S

or I = S

Thus, in our two sector simple economy with neither government, nor foreign trade, investment is identically equal to saving.

Circular Income Flow in a Three Sector Economy with Government:

In our above analysis of money flow, we have ignored the existence of government for the sake of making our circular flow model simple. This is quite unrealistic because government absorbs a good part of the incomes earned by households. Government affects the economy in a number of ways.

Here we will concentrate on its taxing, spending and borrowing roles. Government purchases goods and services just as households and firms do. Government expenditure takes many forms including spending on capital goods and infrastructure (highways, power, communication), on defence goods, and on education and public health and so on. These add to

the money flows which are shown in Fig. 6.3 where a box representing Government has been drawn. It will be seen that government purchases of goods and services from firms and households are shown as flow of money spending on goods and services.

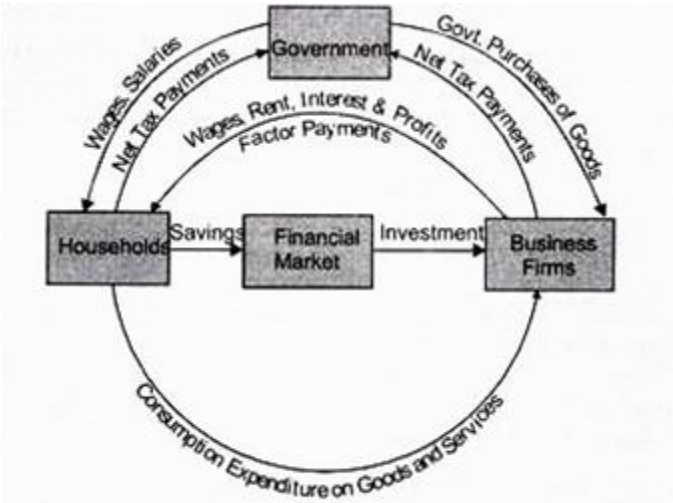


Fig. 6.3. *Circular Income Flow Model with Government*

Government expenditure may be financed through taxes, out of assets or by borrowing. The money flow from households and business firms to the government is labelled as tax payments in Fig. 6.3 This money flow includes all the tax payments made by households less transfer payments received from the Government. Transfer payments are treated as negative tax payments.

Another method of financing Government expenditure is borrowing from the financial market. This can be represented by the money flow from the financial market to the Government and is labelled as Government borrowing (To avoid confusion we have not drawn this money flow from financial market to the Government). Government borrowing increases the demand for credit which causes rate of interest to rise.

The government borrowing through its effect on the rate of interest affects the behaviour of firms and households. Business firms consider the interest rate as cost of borrowing and the rise in the interest rate as a result of borrowing by the Government lowers private investment. However, households who view the rate of interest as return on savings feel encouraged to save more.

It follows from above that the inclusion of the Government sector significantly affects the overall economic situation. Total expenditure flow in the economy is now the sum of consumption expenditure (denoted by C), investment expenditure (I) and Government expenditure (denoted by G). Thus

Total expenditure (E) = C + I + G …..(i)

Total income (K) received is allocated to consumption (C), savings (S) and taxes (T). Thus

Y = C + S + T … (ii)

Since expenditure) made must be equal to the income received (Y), from equations (i) and (ii) above we have

C + I + G = C + S + T … (iii)

Since C occurs on both sides of the equation (iii) and will therefore be cancelled out, we have

I + G = S + T …(iv)

By rearranging we obtain

G – T = S – I … (v)

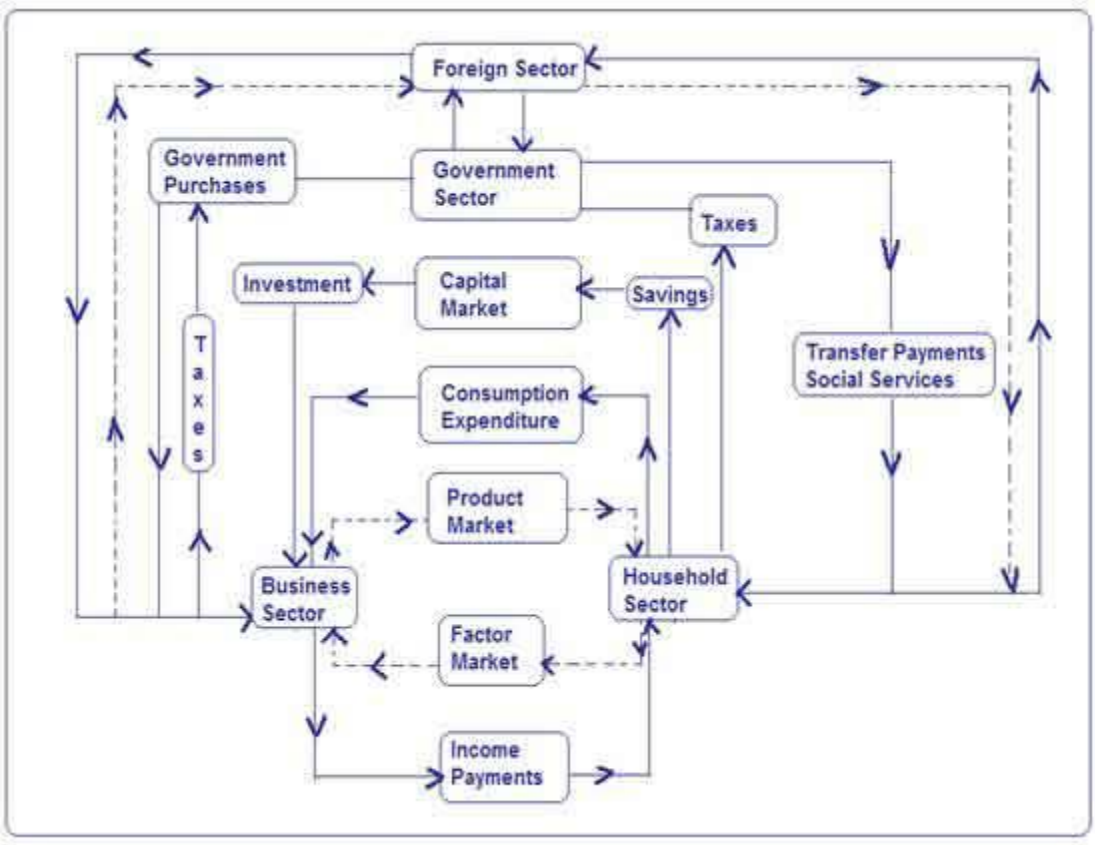
Equation (v) is very significant as it depicts what would be the consequences if government budget is not balanced, that is, if Government expenditure (G) is greater than the tax revenue (7), that is, G >T, the government will have a deficit budget. To finance the deficit budget, the Government will borrow from the financial market.

For this purpose, then private investment by business firms must be less than the savings of the households. Thus Government borrowing reduces private investment in the economy. In other words, Government borrowing crowds out private investment.

Money Income Flows in the Four Sector Open Economy: Adding Foreign Sector:

We now turn to explain the money flows that are generated in an open economy, that is, economy which have trade relations with foreign countries. Thus, the inclusion of the foreign sector will reveal to us the interaction of the domestic economy with foreign countries. Foreigners interact with the domestic firms and households through exports and imports of goods and services as well as through borrowing and lending operations through financial market. Goods and services produced within the domestic territory which are sold to the foreigners are called exports.

On the other hand, purchases of foreign-made goods and services by domestic households are called imports. Figure 6.4 illustrates additional money flows that occur in the open economy when exports and imports also exist in the economy. In our analysis, we assume it is only the business firms of the domestic economy that interact with foreign countries and therefore export and import goods and services.



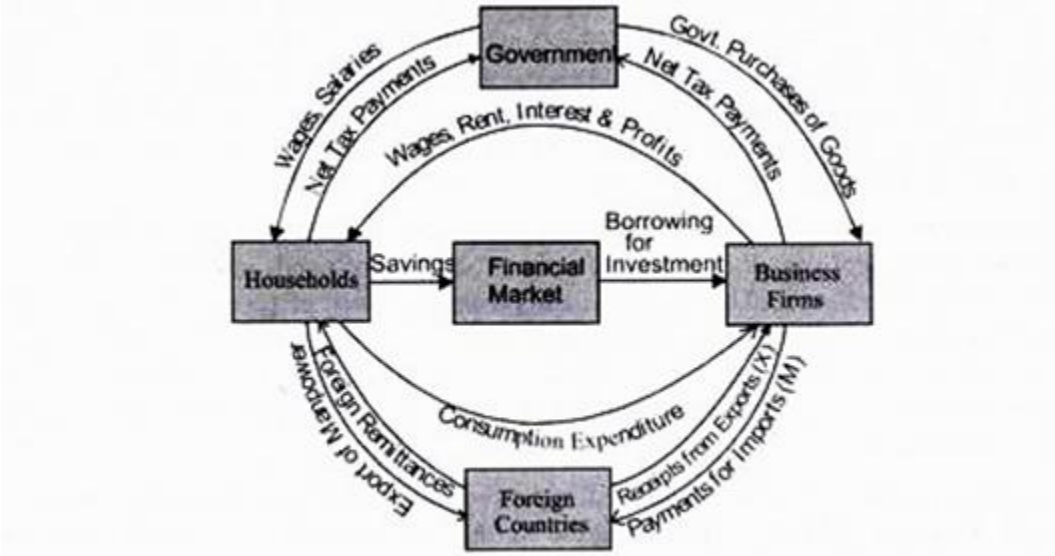


Fig. 6.4. *Circular Flow of Income in an Open Economy with Government and Foreign Sector*

A flow of money spending on imports have been shown to be occurring from the domestic business firms to the foreign countries (i.e., rest of the world). On the contrary, flow of money expenditure on exports of a domestic economy has been shown to be taking place from foreign countries to the business firms of the domestic economy.

If exports are equal to the imports, then there exists a balance of trade. Generally, exports and imports are not equal to each other. If value of exports exceeds the value of imports, trade surplus occurs. On the other hand if value of imports exceeds value of exports of a country, trade deficit occurs.

In the open economy there is interaction between countries not only through exports and imports of goods and services but also through borrowing and lending funds or what is also called financial market. These days financial markets around the world have become well integrated.

When there is a trade surplus in the economy, that is, when exports (X) exceed imports (M), net capital inflow will take place. By net capital inflow we mean foreigners will borrow from domestic savers to finance their purchases of domestic exports. In this way as a result of net capital inflow domestic savers will lend to foreigners, that is, acquire foreign financial assets.

On the contrary, in case of import surplus, that is, when imports are greater than exports, trade deficit will occur. Therefore, in case of trade deficit, domestic consumer households and business firms will borrow from abroad to finance their excess of imports over exports. As a result, foreigners will acquire domestic financial assets.

From the circular flows that occur in the open economy the national income must be measured by aggregate expenditure that includes net exports, that is, X-M where X represents exports and M represents imports. Imports must be subtracted from the total expenditure on foreign produced goods and services to get the value of net exports. Thus, in the open economy

National Income = C + I + G + NX

where NX represents net exports, X-M.

Since national income can be either consumed, saved or paid as taxes to the Government we have

C + I + G + NX = C + S + T

Social Accounting: Concept, Definition, Features and Benefits | Financial Analysis

Let us make in-depth study of the concept definition, features and benefits of social accounting.

Concept of Social Accounting:

Business is a socio-economic activity and it draws its inputs from the society, hence its objective should be the welfare of the society. It should owe a responsibility towards solving many of the social problems. In the present age of growing technological, economic, cultural and social awareness, the accounting has not only to fulfill its stewardship function for the owners of the enterprise, but also accomplish its social function.

Changing environments and social parameters have compelled business enterprises to account and report information with regard to discharge of their social responsibilities. The boundaries of the principles, practices and skills of

conventional accounting have been extended to such areas for social disclosure and attestation with regard to the measures of social programmes.

The concept of ‘Social Accounting’ has gained importance as a result of high level industrialization which has brought prosperity as well as many problems to the society. It has necessitated the corporate sector, with huge amounts of funds at their disposal, to invest substantial amounts in social activities so as to nullify the adverse effects of industrialization. “In modern times, accounting efforts have been extended to the assessment of the state of society and of the social programmes not for the satisfaction of any individual or group but for the application of evaluative procedures in the allocation of resources towards better social well being as a whole.”

Social accounting is concerned with the study and analysis of accounting practice of those activities of an organisation. The concept of socialistic pattern of society, civil rights movements, environmental protection and ecological conservation groups, increasing awareness of society towards corporate social contribution, etc. Have contributed towards the growing importance of Social accounting.

Social Accounting, also known as Social Responsibility Accounting, Socio-Economic Accounting, Social Reporting and Social Audit, aims to measure and inform the general public about the social welfare activities undertaken by the enterprise and their effects on the society.

As per F.F. Perry’s Dictionary of banking, social accounting is the reporting of the cost incurred in employing with anti-pollution, safety and health and other societal

beneficial requirements and, more generally the impact of business entity on the endeavor to project society its amenities and the environment.

In the words of Richard Dobbins and David Fanning, social accounting is “the measurement and reporting of information concerning the impact of an entity and its activities on society.” The National Association of Accountants (NAA) Committee defined social accounting as ‘the identification, measurement, monitoring and reporting of the social and economic effects of an institution on society.” It is, thus clear that social accounting is concerned with the internal

and external reporting of social costs and benefits both in quantitative as well as qualitative terms by a business enterprise.

The term ‘social audit’ has in the past been mostly linked with ‘social accounting’ and the two terms have been used interchangeably in the literature. However, some

writers on the subject use the term social accounting as distinct from the term social audit. Social audit is an objective assessment of a business enterprise as to how it has been able to discharge its social obligations in the course of its operations. The concept of social audit is a new emerging dimension in the audit literature. It is neither a statutory audit nor a performance audit, but a mixture of both.

Definitions of Social Accounting:

Social Accounting:

“Social Accounting is the application of double entry book keeping to social economic analysis.” —Kohler

Comments:

This is an orthodox definition as it is based on application of book keeping principles rather than sophisticated techniques of management accounting to the national socio-economic situation.

“The measurement and reporting, internal and external, of information concerning the impact of an entity and its activities on society.” —Ralph Estes

Comments:

He viewed that social accounting as an independent discipline which is to measure and report the activities of an entity in so far as they effect the society.

“Social accounting as the means by which the effects of social programmes are attempted to be expressed in some type of quantitative terms. —Leonard Spacer

"Social Accounting is the expansion of the existing boundaries of the accounting beyond the normal economic consequences" —Salivary

Features of Social Accounting:

(i) Social accounting is an expression of a company's social responsibilities.

(ii) Social accounting is related to the use of social resources.

(iii) Social accounting emphasize on relationship between firm and society.

(iv) Social accounting determines desirability of the firm in society.

(v) Social accounting is application of accounting on social sciences.

(vi) Social accounting emphasizes on social costs as well as social benefits.

S.C. Mobley has explained the hypothesis on which social accounting is based in his article "Challenges of socio economic accounting" in October 1970, the Accounting Review "The technology of an economic system imposes a structure on its society which not only determines its economic activities but also influences its social relationship and well being. Therefore a measure limited to economic consequences is inadequate as an appraisal of the cause and effect relationships of the total system, it neglects the social effects."

The True blood committee report on the objectives of traditional financial statements in 1973 broke with traditional orientation of them toward stewardship reporting and instead added new dimensions of socio economic to the scope of accounting literature.

True blood committee report on "the objectives of financial statements" has stated that "an objective of financial statements is to report on those activities of the enterprise affecting society which can be

determined and described or measured and which are important to the role of the enterprise in its social environment." This quote of true blood committee itself confirms formal recognition of social accounting. Debate initiated in 1960 with slogan "Profits should not be the

sole objective of the business" in the management literatures, is now dominating in accounting literature, attempts are being made to align profit to other social goals. The term "social profit" has emerged and being considered as a barometer of responsible business behaviour, A series of published work initiated in 1960 by C.G. Mobley. Coopers (1972) AICPA committee on social measurement (1977) Ramanathan (1976) Belkaoui (1976), Owens (1992) and Roberts (1992) are still going on in most of the developed nations like U.K.

and U.S.A. These published works are evidence of recognition of social accounting throughout the whole globe.

Need/Benefits of Social Accounting:

The important benefits of social accounting are as follows:

(1) A firm fulfills its social obligations and informs its members, the government and the general public to enables everybody to form correct opinion.

(2) It counters the adverse publicity or criticism leveled by hostile media and voluntary social organisations.

(3) It assists management in formulating appropriate policies and programmes.

(4) Through social accounting the firm proves that it is not socially unethical in view of moral cultures and environmental degradation.

(5) It acts as an evidence of social commitment.

(6) It improves employee motivation.

(7) Social accounting is necessary from the view point of public interest groups, social organisations investors and government.

(8) It improves the image of the firm.

(9) Through social accounting, the management gets feedback on its policies aimed at the welfare of the society.

(10) It helps in marketing through greater customer support.

UNIT III

The Classical Theory of Employment and Output

Classical economists such as Adam Smith and Ricardo maintained that the growth of income and employment depends on the growth of the stock of fixed capital and inventories of wage goods. But, in the short ran, the stock of fixed capital and wage goods inventories are given and constant. According to them, even in the short run full-employment of labour force would tend to prevail as the economy would not experience any problem of deficiency of demand.

On the basis of their theory they denied the possibility of the existence of involuntary unemployment in the economy.

The short- run classical theory of income and employment can be explained through the following three stages:

1. Determination of income and employment when there is no saving and investment;

2. Determination of income and employment in an economy with saving and investment; and

3. Determination of income and employment: Role of money and prices.

Determination of Income and Employment in the Short Run without Saving and Investment:

According to the classical theory, the magnitude of national income and employment depends on the aggregate production function and the supply and demand for labour. To show this let us assume that the economy produces one homogeneous and divisible good, say corn. Let symbol Y stand for the output of this good.

To produce this good we require two factors of production:

(1) Labour which we denote by N and

(2) capital which we denote by K. Thus we have the following aggregate production function

Y = F (K, N)

In the short run the stock of capital (i.e. plant and equipment) is assumed to be fixed. The state of technology and the population are also assumed to be constant in the short ran. Thus, rewriting the aggregate production function we have

Y=F (K, N)

The bar over the symbol K for capital indicates that stock of capital is fixed. It is worth noting that change in technology will cause a shift the production junction.

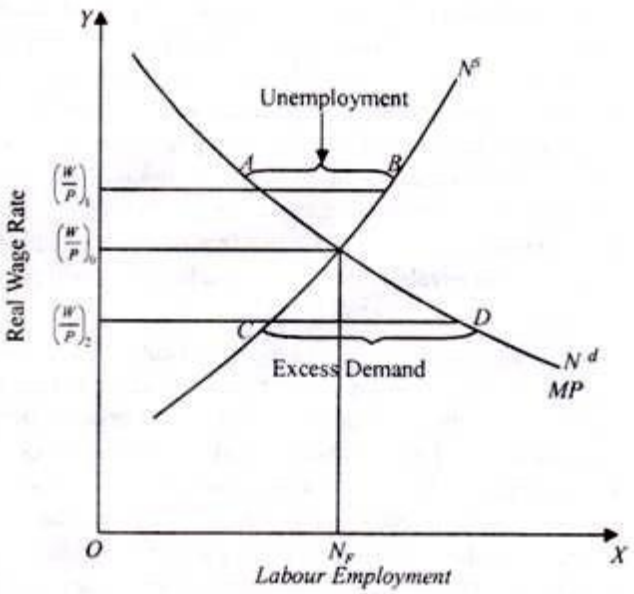


Fig. 3.1. *Labour-Market Equilibrium : Determination of Employment and Wages*

Therefore, with a fixed capital stock and a given and constant technology, the output Y (or what is also the real income) would increase only when employment of labour N increases. That is, employment of labour and output (income) rise or fall together. Now, according to classical theory, with a fixed capital stock as employment of labour increases, marginal product of labour would diminish. This is the famous law of diminishing returns of the classical economics.

The demand for labour is derived from this short-run production function that is, diminishing marginal product of labour. The classical theory assumes perfect competition in both the factor and product markets. Further, assuming that the firms which undertake the task of production attempt to maximise profits, they will employ labour until the marginal product of labour is equal to the given real wage rate.

It may be noted that real wage rate is given by nominal wage rate divided by the general price, level, that is, real wage rate = W/P where W is the nominal or money wage rate and P is the average price level. Thus, a firm will employ so much labour at which

$W/P = MP_N$

where MP_N stands for marginal product of labour.

At a lower real wage rate, more labour will be demanded or employed by the firms and vice versa. Thus, the demand curve for labour is derived from the marginal product curve of labour. In fact, the former coincides with the latter. Thus demand function for labour can be written as

$N^d = f(W/P)$

Consider Fig. 3.1 where MP curve depicts the diminishing marginal product of labour with a given stock of fixed capital and a given state of technology. As explained just above, marginal product (MP) curve of labour also represents the demand curve of labour (N^d).

On the other hand, the supply of labour by the households in the economy depends on their pattern of preference between income and leisure. The classical theory assumes that in the short run when population does not vary, supply curve of labour slopes upward. Now, what is the rational behind the upward-sloping supply curve of labour.

This is based on the assumption that households or individual workers maximise their utility or satisfaction in their choice of work (which yields them income) and leisure. When real wage rate rises, two effects work in opposite direction.

It may be noted that real wage is the opportunity cost or relative price of lesiure. When real wage rate rises leisure becomes relatively more expensive, that is, opportunity cost or price of leisure in terms of income forgone by not working goes up. This induces the individual to

work more (i.e. supply more labour hours) and thereby substitutes income for leisure. This is the substitution effect.

On the other hand, with a rise in real wage rate individuals become relatively richer than before, and this induces them to consume more of all commodities (including leisure which is regarded as a normal commodity). This is income effect of the rise in real wage rate which tends to increase leisure and reduce labour-hours supplied.

The classical economists believed that substitution effect is larger than income effect of the rise in real wage rate and as a result supply of labour increases with the rise in wage rate. Thus the supply function of labour can be written as

$N^s = g\ (W/P)$

This implies that at a higher wage rate, more labour would be supplied and vice versa. It will be seen from Fig. 3.1 that supply and demand for labour are in equilibrium at the real wage rate (W/P)

Hence, given the supply and demand curves, the wage rate W/P is determined. It will be seen that ON labour is employed in this equilibrium situation. Thus, in classical theory level of employment is determined by labour market equilibrium. This equilibrium between supply and demand for labour at the real wage rate W/P implies that all those who offer their labour services at this wage rate are in fact employed.

There is neither excess supply of labour, nor excess demand for labour. In other words, there is no involuntary unemployment of labour in this equilibrium situation. If somehow real wage rate in the labour market is higher than this equilibrium wage rate $(W/P)_0$, say it is equal to $(W/P)_1$ then it will be observed from Fig. 3.1 that excess supply of labour equal to AB would emerge. In other words, at real wage rate $(W/P)_1$, AB workers will be unemployed.

But given the competition among workers, the excess supply of labour at wage rate $(W/P)_1$ would cause the wage rate to fall to the equilibrium level $(W/P)_0$ at which the labour market is cleared. On the contrary, if somehow real wage rate in the labour market is $(W/P)_2$ the firms would demand more labour than is offered at this real wage rate.

As a result of the competition among the firms to hire labour desired by them, the wage rate would go up to the equilibrium level $(W/P)_0$. At $(W/P)_0$ to repeat, all those who offer their labour services are in fact demanded and employed. It therefore follows that at the real wage $(W/P)_0$, there is no involuntary unemployment, or, in other words, full-employment of labour prevails. Further, it is the wage flexibility (i.e., changes in the wage rate) which ultimately brings about this full-employment situation.

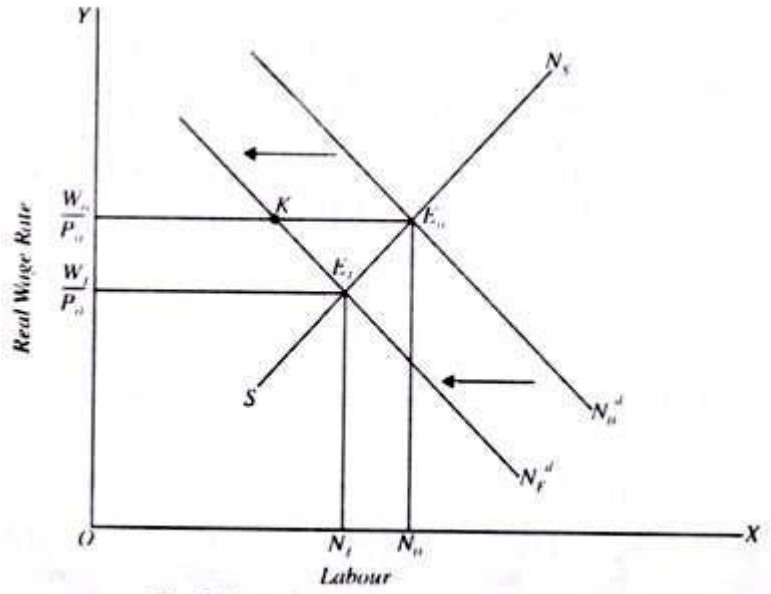


Fig. 3.1A. *Adjustment of real wage rate*

To clarify further the restoration of full employment of labour due to quick adjustment of real wage rate let us consider the decrease in demand for Y labour following the fall in aggregate demand for output as it happens when depression or recession occurs in the economy. Consider Fig. 3.1(A) where following the =c decrease in aggregate demand for output labour demand curve shifts to the left to N^d_1 so that at the initial wage rate W_0 / P_0 fewer workers will be demanded than the number of workers who are willing to supply their labour at this wage rate. As a result (as is seen from Fig. 3.1 A) the excess supply of labour equal to KE_0 will emerge at this initial real wage rate W_0/P_0.

However, in the classical full employment model this excess supply of labour (i.e. unemployment of workers) will cause real wage rate to fall to W_1/P_0 (where $W_1 < W_0$) at which new equilibrium between demand for and supply of labour is again established at point E_1. Note that even in this new labour market equilibrium at lower real wage rate W_1/P_0 full employment

of labour prevails as all those who are willing to work at this real wage rate find employment. Of course, N_0N_1 workers have voluntarily withdrawn themselves from labour force and therefore no one remains involuntarily unemployed.

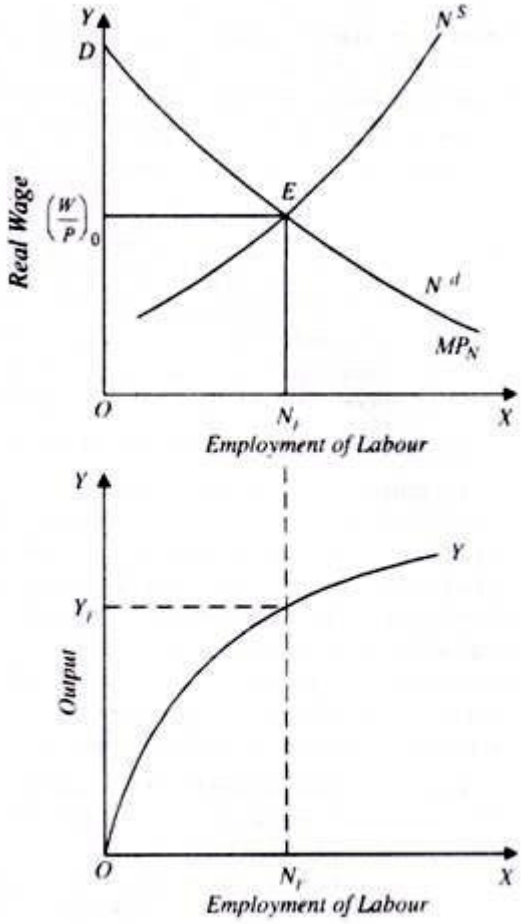


Fig. 3.2. *Classical Theory : Determination of Employment and Output*

How much output will be produced in this full employment situation can be readily known from the aggregate production function. We depict this in Fig. 3.2 where in addition to the supply of and demand for labour, the aggregate production function (OY) representing the relation between employment of labour (N) and total output (K) is shown. It will be seen from the lower panel of Fig. 3.2 that, given the stock of fixed capital and the state of technology, employment of ON_F labour produces OY_F output.

This output OY_F of corn will constitute the income of the society and will be distributed between wages and profits. Thus sum of wages as reward for labour and total profits as reward

for capital would constitute the total income of the society and would be equal to the national output OY_F produced.

It follows from above that the quick changes in the real wage rate upward or downward ensures that neither excess supply of labour, nor excess demand for labour will persist and thus equilibrium will be reached with full employment of labour in the economy. Further, given the stock of capital and the state of technology with this full employment of labour, total output or income of the economy equal to OY_F is determined.

Now, an important question to enquire is what guarantees that output produced by the full employment of labour and the level of capital (assumed as fixed in the short run) will be actually demanded. If this does not happen, then the problem of insufficient demand for the output (i.e., corn) will emerge which will ultimately lead to reduction in output and employment and hence to the emergence of involuntary unemployment.

Say's Law and No Deficiency of Demand:

In the absence of saving and investment which we are assuming here, classical economists ruled out the possibility of deficiency of aggregate demand on the basis of Say's law. Say's law, as mentioned above, states that supply creates its own demand, that is, acts of production of goods create demand equal to the value of output of goods produced. Factors of production earn their incomes during the process of production. Since no part of income is saved as is being assumed here the entire income will be spent on consumer goods produced.

Value of output produced will therefore be equal to the income generated in the process of production. Thus, quantity demanded will be equal to the supply of output produced. In Fig. 3.2, wages earned by ON_F quantity of labour employed and profits earned by the entrepreneurs will be spent on OY_F output. Expenditure so made will be equal to the value of output produced. Aggregate demand being equal to aggregate supply, there is no problem of deficiency of demand.

Say's law that "supply creates its own demand" holds and full employment of labour is guaranteed. In this way classical theory denies the possibility of involuntary unemployment. It needs to be emphasised that under such conditions, two things ensures full employment. First, it is because saving and investment are excluded from the system so that entire income is spent on

consumer goods. Second, real wage rate changes quickly to bring about equilibrium between demand for and supply of labour.

Classical Model: Determination of Income and Employment with Saving and Investment:

In applying Say's law that supply creates its own demand an invalid assumption was made above that entire income earned by the households will be actually spent. Although it is correct that production of output generates an equal amount of income but what is the guarantee that all income earned by factors/households will be actually spent on goods and services produced. In fact, a part of income might be saved. Saving represents a withdrawal of some income from the expenditure flow.

This will result in deficiency of demand or expenditure on output of goods produced. Thus, if a part of income is saved (that is, not spent), supply of output produced would not create sufficient demand for itself. This will cause deficiency of aggregate demand which will cause fall in output and employment and the emergence of involuntary unemployment.

However, classical economists denied the possibility of deficiency of aggregate demand even when a part of income is saved by the households. They showed that Say's law that supply creates its own demand holds good even in the presence of saving. They argued that every rupee saved by households will be invested by businessmen, that is, investment expenditure will be equal to savings done by households. In fact, output produced consists of consumer goods and capital goods.

Income earned from production will be partly spent on consumer goods and partly on investment in capital goods. What is not spent on consumer goods is saved and investment expenditure on capital goods made by businessmen equals this savings. Therefore, there is no deficiency of demand or expenditure and circular flow of income goes on undisturbed. Thus, supply goes on creating its own demand and Say's law applies.

Now the pertinent question is what is the guarantee that investment expenditure will be equal to savings of the households. According to classical economists, it is the changes in the

rate of interest that brings about equality between saving and investment. Further, according to them, rate of interest is determined by supply of savings and demand for investment. The investment demand is stipulated to be decreasing function of the rate of interest .

At the lower rate of interest, more would be borrowed for investment. On the other hand, the savings of the people are taken to be the increasing function of the rate of interest, that is, higher the rate of interest, the larger the savings and vice versa. The loan market will be in equilibrium at the rate of interest at which the demand for investment is equal to the supply of savings. The changes in rate of interest would cause investment and supply of saving to become equal. This is illustrated in Fig. 3.3 (a). It will be seen that intersection of investment demand curve II and the supply of savings curve SS determines the rate of interest i.

At a higher rate of interest i_2, the investment demand is less than the intended supply of savings. Due to the excess supply of savings, the rate of interest would fall to i. On the contrary, at a lower rate of interest, say i_1 the demand for investment exceeds the supply of savings. Now, due to the excess demand for investment in the loan market rate of interest would go up. Thus, it is at rate of interest I that loan market is in equilibrium, i.e., investment is equal to savings (I = S).

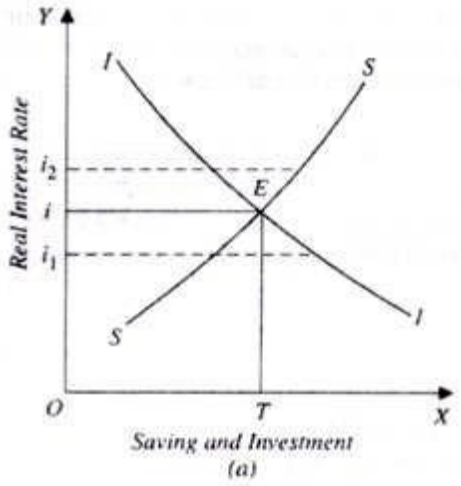


Fig. 3.3. *Changes in rate of interest bring about equality between saving and investment.*

Now an important thing to know about classical theory is when due to decline in profit expectations of business firms if investment falls as it happens at times of recession or depression how it then explains that demand deficiency problem would not arise and equilibrium

will continue to remain at full employment. This is illustrated in Figure 3.4, where initially saving and investment are in equilibrium at rate of interest i_0.

Now suppose that due to fall in profit expectations investment by business firms decreases by ΔI or EK causing a shift in the investment curve to the left to the new position I'I'. With this at the initial rate of interest i_0, the supply of savings exceeds investment by KE. This excess supply of savings will put downward pressure on the rate of interest and as result interest will fall to i_1, at which saving and investment are again equal.

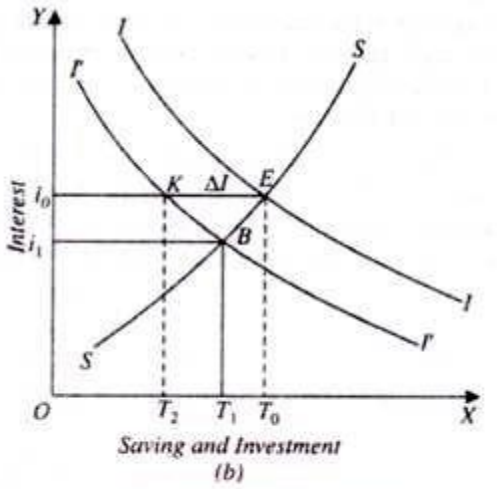


Fig. 3.4. *Decrease in investment demand does not disturb full-employment equilibrium.*

According to classical theory, the lower interest induces more investment and therefore as a result of fall in interest to i_1, investment increases from OT_2 Besides, with the fall in interest rate from i_0 to i_1, savings decline by T_0T_1 which implies consumption demand will increase by T_0T_1.

Thus, shift in investment demand curve to the left results in lowering of rate of interest which leads to more investment and consumption demand so that aggregate demand is not affected. It is thus clear that due to adjustment in interest rate even decline in investment does not give rise to demand deficiency problem and full-employment continues to prevail.

It follows from above that the equality between investment and saving, brought about by changes in the rate of interest, would guarantee that aggregate demand for output would be equal to aggregate supply of output. Thus, the problem of deficiency of aggregate demand would not be faced and full employment of labour will prevail.

Classical Theory of Income and Employment: Aggregate Demand, Money and Prices:

Now, we shall examine how full employment of labour is assured in the classical theory even when money is introduced in the system. The introduction of money does not affect the result of the classical theory that problem of deficiency of aggregate demand would not be experienced by the free-market system and therefore full employment of labour is guaranteed.

The quantity of money, according to the classical theory, determines only the price level of output and in no way affects the real magnitudes of saving and investment. Further, since quantity of money determines the price level of output, it also affects real wage rate, that is, the ratio of money wages and the price level, or W/P. But with increase in money supply, money wages and price level change in such a way that real wage rate in the equilibrium situation remains constant and equilibrium in the labour market is automatically restored.

Besides, with the increase in money supply and consequent change in the price level, saving-investment equilibrium will not be disturbed and therefore deficiency of aggregate demand will not arise. Let us first explain how in classical theory price level in the economy is determined. Classical economists believed in the Quantity Theory of Money according to which it is the supply of money that determines price level in an economy.

Quantity theory of money is generally expressed by Fisher's equation of exchange, income version of which is stated as under:

$MV = PY$

$P = MV/Y$

M = Quantity of money

V – Income velocity of circulation of money

Y = Level of aggregate output (or real income)

P = Price level of goods and services

Velocity of money is defined as the number of times a unit of money is used for purchase of final goods and services in a period, say during a year. In classical theory velocity is assumed to be constant. Besides, since in classical theory level of aggregate output is determined by the supply of productive resources, (i.e., capital stock, availability of labour, land etc.) and the state of technology which do not change in the short run.

Further, due to operation of Say's law and wage-price flexibility full employment of resources occur in the economy. Thus, with a given amount of productive resources and constant technology and with further assumption that they are fully utilised and employed, the aggregate output (Y) is held constant at full-employment level of output in the short run.

Therefore, in Fig. 3.5 we have shown aggregate supply curve as a vertical straight line which shows that whatever the price level, aggregate output remains constant.

From equation (ii) above it follows that, with V and Q remaining constant, increase in money supply will cause proportionate increase in the price level.

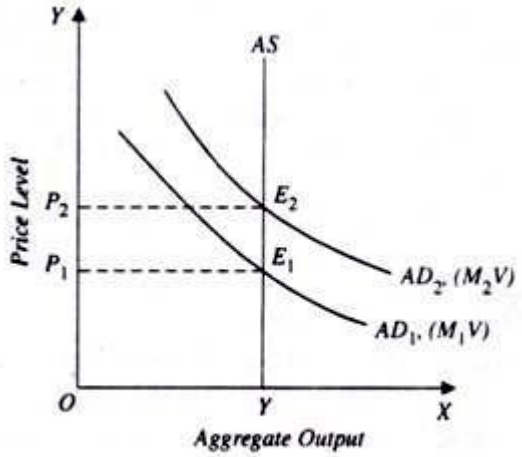


Fig. 3.5. *Increase in the quantity of money causes proportionate rise in the price level.*

The effect of increase in the quantity of money is graphically shown in Fig. 3.5. It may be noted that MV in the quantity theory of money represents aggregate expenditure on goods and services made in a year. For instance, if money supply in an economy equals Rs. 500 crores and velocity of circulation is 4, then 500 X 4 = 2000 crores will be aggregate expenditure.

In other words, in Figure 3.5 MV represents aggregate expenditure or aggregate demand (AD) curve which slopes downward to the right. This is because at a lower price level, given the aggregate expenditure as determined by MV, more quantity of goods and services will be purchased.

Suppose quantity of money in the economy is equal to M_1. With velocity of money V, aggregate expenditure on final goods and services will be equal to M_1V and corresponding to this aggregate demand curve AD_1 has been drawn in Fig. 3.5. With aggregate supply curve AS and aggregate demand curve AD_1 price level OP_1 is determined.

Now, with increase in money supply to M_2, velocity of money V remaining constant, aggregate expenditure will rise to M_2V and aggregate demand curve will shift to the right to AD_2 position. Intersection of aggregate demand curve AD_2 and aggregate supply curve AS determines a higher price level OP_2. It therefore follows that increase in the quantity of money causes price level to rise. Indeed, the rise in price level will be proportional to the increase in quantity of money.

Classical Aggregate Supply Curve:

Aggregate supply curve describe the relationship between aggregate supply of output with price level. Classical theory regards aggregate supply curve to be perfectly inelastic. Now, an important question is why in classical model, aggregate supply curve is perfectly inelastic. As explained above, aggregate output Y_F is determined by the equilibrium level of employment N_F given the aggregate production function.

Equilibrium level of employment along with real wage rate is determined by labour market equilibrium, that is, equilibrium between demands for the supply of labour.

Thus, in classical theory aggregate supply curve is determined by supply-side factors, namely, preferences of households or individuals regarding work and leisure, the stock of capital (and other factor endowments), the state of technology. Supply of labour, as seen above, is determined by individual preferences between work and leisure and demand curve for labour is determined by marginal product of labour.

Thus in classical model aggregate supply curve reflects supply-determined nature of output and does not depend on the aggregate demand and price level. The classical aggregate

supply curve is shown in Fig. 3.6. The pertinent questions is how with changes in price level, which in the classical theory depends on the quantity of money, leave level of employment and output unaffected.

The reason for this is that changes in price level causes equal proportionate changes in money wage rate with the result that the equilibrium real wage rate which is given by W/P remains constant and therefore equilibrium level of employment does not get affected. The adjustment process works in the following way.

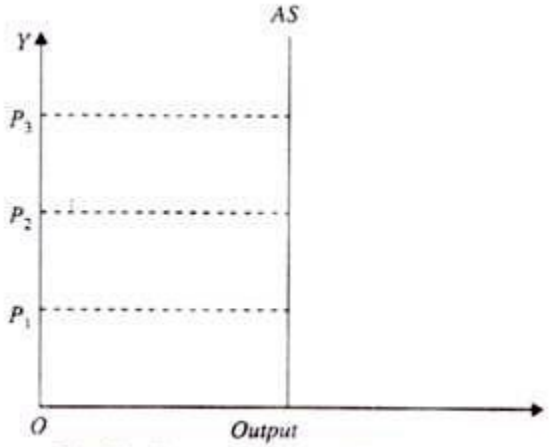


Fig. 3.6. *Classical Aggregate Supply Curve*

If due to the increase in supply of money price level rises, with a given money wage rate (W), real wage rate, which is equal to W/P, will fall. At a real wage rate lower than the equilibrium real wage rate, the quantity demanded of labour will exceed the supply of labour.

This disequilibrium between labour demand and supply will cause money wage rate to rise to the level so that original real wage rate determined by labour market equilibrium is restored. Suppose that in labour-market equilibrium money wage rate W_1 and given the price level equal to P_1 and the equilibrium real wage rate will be W_1/P_1. Now, if price level is doubled to $2P_1$ and money wage rate rises to 2 W_1, then the equilibrium real wage rate will become equal to $2W_1/2P_1 = W_1/P_1$.

Thus, with equal proportionate increase in money wage rate as a result of rise in price level, equilibrium real wage rate and level of employment will remain unaffected. Thus, with rise in price level, level of employment remains unchanged and, given the aggregate production

function, level of output will remain constant. This implies that aggregate supply curve of output is perfectly inelastic.

Thus whatever the price level, money wage rate changes in such a way that equilibrium real wage rate, level of employment and therefore output remain constant. Thus in classical theory aggregate supply of output is determined by supply-side real variables and does not depend on money and prices.

The Keynesian Theory of Income, Output and Employment

In the Keynesian theory, employment depends upon effective demand. Effective demand results in output. Output creates income. Income provides employment. Since Keynes assumes all these four quantities, viz., effective demand (ED), output (Q), income (Y) and employment (N) equal to each other, he regards employment as a function of income.

Effective demand is determined by two factors, the aggregate supply function and the aggregate demand function. The aggregate supply function depends on physical or technical conditions of production which do not change in the short-run.

Since Keynes assumes the aggregate supply function to be stable, he concentrates his entire attention upon the aggregate demand function to fight depression and unemployment. Thus employment depends on aggregate demand which in turn is determined by consumption demand and investment demand.

According to Keynes, employment can be increased by increasing consumption and/or investment. Consumption depends on income C(Y) and when income rises, consumption also rises but not as much as income. In other words, as income rises, saving rises.

Consumption can be increased by raising the propensity to consume in order to increase income and employment. But the propensity to consume depends upon the psychology of the people, their tastes, habits, wants and the social structure which determine the distribution of income.

All these elements remain constant during the short-run. Therefore, the propensity to consume is stable. Employment thus depends on investment and it varies in the same direction as the volume of investment.

Investment, in turn, depends on the rate of interest and the marginal efficiency of capital (MEC). Investment can be increased by a fall in the rate of interest and/or a rise in the MEC. The MEC depends on the supply price of capital assets and their prospective yield.

It can be raised when the supply price of capital assets falls or their prospective yield increases. Since the supply price of capital assets is stable in the short- run, it is difficult to lower it. The second determinant of MEC is the prospective yield of capital assets which depends on the expectations of yields on the part of businessmen. It is again a psychological factor which cannot be depended upon to increase the MEC to raise investment. Thus there is little scope for increasing investment by raising the MEC.

The other determinant of investment is the rate of interest. Investment and employment can be increased by lowering the rate of interest. The rate of interest is determined by the demand for money and the supply of money. On the demand side is the liquidity preference (LP) schedule.

The higher the liquidity preference, the higher is the rate of interest that will have to be paid to cash holders to induce them to part with their liquid assets, and vice versa. People hold money (M) in cash for three motives: transactions, precautionary and speculative.

The transactions and precautionary motives (M) are income elastic. Thus the amount held under these two motives (M_1) is a function (L_1) of the level of income (Y), i.e. M=L (Y). But the money held for speculative motive (M_2) is a function of the rate of interest (r), i.e. $M=L_2$ (r). The higher the rate of interest, the lower the demand for money, and vice versa.

Since LP depends on the psychological attitude to liquidity on the part of speculators with regard to future interest rates, it is not possible to lower the liquidity preference in order to bring down the rate of interest. The other determinant of interest rate is the supply of money which is assumed to be fixed by the monetary authority during the short-run.

The relation between interest rate, MEC and investment is shown in Figure 1, where in Panels (A) and (B) the total demand for money is measured along the horizontal axis from M onward. The transactions (and precautionary) demand is given by the L_1 curve at OY_1 and OY_2 levels of income in Panel (A) of the figure.

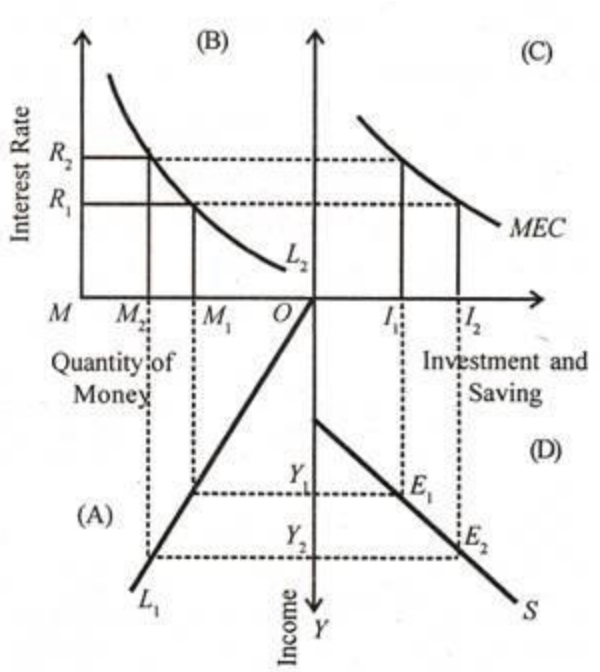


Fig. 1

Thus at OY_1 income level, the transactions demand is given by OM_1 and at OY_2 level of income it is OM_2. In Panel (B), the L_2 curve represents the speculative demand for money as a function of the rate of interest.

When the rate of interest is R_2, the speculative demand for money is MM_2. With the fall in the rate of interest to R_1, the speculative demand for money increases to MM_1. Panel (C) shows investment as a function of the rate of interest and the MEC. Given the MEC, when the rate of interest is R_2, the level of investment is OI_1. But when the rate of interest falls to R_1, investment increases to OI_2.

"In the Keynesian analysis, the equilibrium level of employment and income is determined at the point of equality between saving and investment. Saving is a function of income, i.e. S=f (Y). It is defined as the excess of income over consumption, S=Y-C and income is equal to consumption plus investment.

Thus Y = C + I

Or Y-C = I

Y-C = S

I = S

So the equilibrium level of income is established where saving equals investment. This is shown in Panel (D) of Figure 1 where the horizontal axis from O toward the right represents investment and saving, and OY axis represents income. S is the saving curve.

The line I_1E_1 is the investment curve (imagine that it can be extended beyond E as in an S and I diagram) which touches the S curve at E_1. Thus OY_1 is the equilibrium level of employment and income. This is the level of underemployment equilibrium, according to Keynes. If OY_2 is assumed to be the full employment level of income then the equality between saving and investment will take place at E_2 where I_2E_2 investment equals Y_2E_2 saving.

The Keynesian theory of employment and income is also explained in terms of the equality of aggregate supply (C+S) and aggregate demand (C+I). Since unemployment results from the deficiency of aggregate demand, employment and income can be increased by increasing aggregate demand.

Assuming the propensity to consume to be stable during the short-run, aggregate demand can be increased by increasing investment. Once investment increases, employment and income increase. Increased income leads to a rise in the demand for consumption goods which leads to further increase in employment and income.

Once set in motion, employment and income tend to rise in a cumulative manner through the multiplier process till they reach the equilibrium level. According to Keynes, the equilibrium level of employment will be one of under-employment equilibrium because when income increases consumption also increases but by less than the increase in income.

This behaviour of the consumption function widens the gap between income and consumption which ordinarily cannot by filled up due to the lack of required investment. The full

employment income level can only be established if the volume of investment is increased to fill the income-consumption gap corresponding to full employment.

The Keynesian cross model of under-employment equilibrium is explained in Figure 2 where income and employment are taken on the horizontal axis and consumption and investment on the vertical axis. Autonomous investment is taken as a first approximation. C+I is the aggregate demand curve plotted by adding to consumption function C an equal amount of investment at all levels of income.

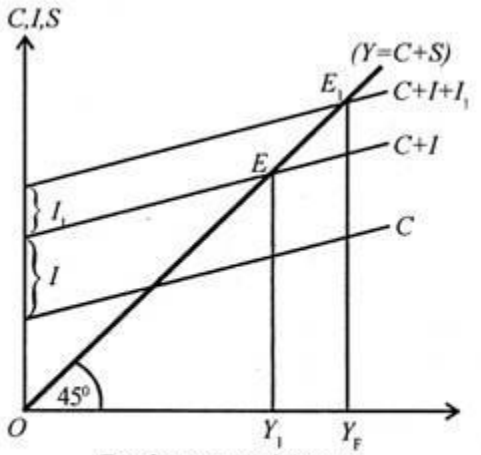


Fig. 2

The 45° line is the aggregate supply curve. The economy is in equilibrium at point E where the aggregate demand curves C+I intersects the 45° line. This is the point of effective demand where the equilibrium level of income and employment OY_1 is determined.

This is the level of underemployment equilibrium and not of full employment. There are no automatic forces that can make the two curves cross at a full employment income level. If it happens to be a full employment level, it will be accidental. Keynes regarded the under-employment equilibrium level as a normal case and the full employment income level as a special case.

Suppose OY_F is the full employment income level. To reach this level, autonomous investment is increased by I_1 so that the C+I curve shifts upward as $C+I+I_1$, curve. This is the new aggregate demand curve which intersects the 45° line (the aggregate supply curve) at E_1, the higher point of effective demand corresponding to the full employment income level OY_F.

This also reveals that to get a desired increase in employment and income of Y_1Y_F, it is the multiplier effect of an increase in investment by I_1 (=I_2 in Panel C of Figure 1) which leads to an increase in employment and income by Y_1Y_F through successive rounds of investment.

The Principles of Effective Demand and Employment Determination Keynes General Theory

Let us make an in-depth study of the Principles of Effective Demand and Employment Determination:-

1. Introduction to the Principle of Effective Demand
2. Keynes's Principle of Effective Demand
3. Meaning of Effective Demand
4. Importance of the Concept of Effective Demand
5. Determinants of Effective Demand
6. Determination of the Level of Employment
7. Underemployment Equilibrium and Others.

Introduction to the Principle of Effective Demand:

Prior to Keynes no satisfactory explanation was given of the factors determining the level of employment in the economy.

Economists mostly assumed the prevalence of the state of full employment believing in Say's law of Markets, an old proposition claiming that all income is automatically spent or that the level of Effective Demand is always enough to lift all goods and services produced off the market.

There were many economists who challenged the assumptions and logic of the Say's Law. For example, T.R. Malthus tried hard to convince contemporaries the demand in general might fall short of supply in general and the deficiency of aggregate demand might cause general over production and hence general unemployment.

But Malthus failed to explain how effective demand could be deficient or excessive. It was Keynes, who for the first time put forward a systematic and convincing theory of

employment based on the ‘Principle of Effective Demand”. The idea behind this theory is not difficult to grasp.

Keynes’s Principle of Effective Demand:

The principle of ‘effective demand’ is basic to Keynes’ analysis of income, output and employment. Economic theory has been radically changed with the introduction of this principle. Stated briefly, the Principle of Effective Demand tells us that in the short period, an economy’s aggregate income and employment are determined by the level of aggregate demand which is satisfied with aggregate supply.

Total employment depends on total demand. As employment increases, income increases. A fundamental principle about the propensity to consume is that as the real income of the community increases, consumption will also increase but by less than income.

Therefore, in order to have enough demand to sustain an increase in employment there must be an increase in real investment equal to the gap between income and consumption out of that income. In other words, employment can’t increase, unless investment increases.

We can generalize and say; a given level of income and employment cannot be maintained unless investment is sufficient to absorb the saving out of that level of income. This is the core of the principle of effective demand.

Meaning of Effective Demand:

Effective demand manifests itself in the spending of income. It is judged from the total expenditure in the economy. The total demand in the economy consists of consumption goods and investment goods, though consumption goods demand forms a major part of the total demand.

Consumption goes on increasing with increase in income and employment. At various levels of income there are corresponding levels of demand but all levels of demand are not effective. Only that level of demand is effective which is fully met with the forthcoming supply so that entrepreneurs neither have a tendency to reduce nor to expand production.

Effective Demand is the demand for the output as a whole; in other words, out of the various levels of demand, the one which is brought in equilibrium with supply in the economy is called effective demand. It was this theory of effective demand which remained neglected for more than 100 years and came into prominence with the appearance of Keynes' General Theory.

Keynes was interested in the problem of how much people intended to spend at different levels of income and employment, as it was this intended spending that determined the level of consumption and investment. Keynes's view was that people's intentions to spend were translated into aggregate demand. Should aggregate demand, said Keynes, fall below income businessmen expect to receive, there will be cut backs on production of goods resulting in unemployment. On the opposite, should aggregate demand exceed expectations, production will be stimulated.

In any community, effective demand represents the money actually spent by- people on goods and services. The money which the entrepreneurs receive is paid to the factors of production in the form of wages, rent, interest and profit. As such, effective demand (actual expenditure) equals national income which is the sum of the income receipts of all members of the community.

It also represents the value of the output of the community because the total value of the national output is just the same thing as the receipts of the entrepreneurs from selling goods. Further, all output is either consumption goods or investment goods; we can therefore say that effective demand is equal to national expenditure on consumption plus investment goods.

Thus, effective demand (ED) = national income (Y) = value of national output = Expenditure on consumption goods (C) + expenditure on investment goods (I).

Therefore, ED = Y = C + I= 0 = Employment.

Importance of the Concept of Effective Demand:

The principle of effective demand occupies an integral position in the Keynesian theory of employment. The general theory has the basic observation that total demand determines total

employment. A deficiency of effective demand causes unemployment. The Principle of Effective Demand has its importance on the following counts.

In the first place, it can be said that it is with the help of the concept of effective demand that Say's Law of Markets has been repudiated. The concept of effective demand has established beyond doubt that whatever is produced is not automatically consumed nor is the income spent at a rate which will keep the factors of production fully employed.

Secondly, an analysis of effective demand also shows the inherent contradictions in Pigou's plea that wage cuts will remove unemployment. In Keynes' view, as level of employment depends upon the level of effective demand, wage cuts may or may not increase employment.

Thirdly, the Principle of Effective Demand could explain as to how and why a depression could come to stay. Keynes explained that Effective demand consists of consumption and investment.As employment increases, income also increases leading to a rise in consumption but by less than the rise in income. Thus, consumption lags behind and becomes the chief reason of the gap that comes to exist between total income and total expenditure therefore, in order to maintain effective demand at earlier (or original) level, real investment, equal to the gap between income and consumption, must be made. In other words, employment cannot expand unless investment expands. Therein has the all most importance of the principle of effective demand. It makes clear that investment rules the roost.

Fourthly, it puts the spotlight on the demand side. In contrast to the classical emphasis on the supply side, Keynes placed major emphasis on demand side and traced fluctuations in employment to changes in demand. The theory of effective demand makes clear how and why aggregate demand becomes deficient in a capitalist economy and how deficiency of effective demand generates depression.

Determinants of Effective Demand:

For an understanding of Keynes' theory of employment and how an equilibrium level of employment is established in the economy, we must know its determinants the aggregate demand function and the aggregate supply function and their inter-relationship.

1. Aggregate Demand Function, and

2. Aggregate Supply Function.

1. Aggregate Demand Function:

Aggregate Demand Function relates any given level of employment to the expected proceeds from the sale of production out of that volume of employment. What the expected sale proceeds will be depends upon the expected expenditures of the people on consumption and investment. Every producer in a free enterprise economy tries to estimate the demand for his product and calculate in anticipation the profit likely to be earned out of his sale proceeds.

The sum-total of income payments made to the factors of production in the process of production constitutes his factor costs. Thus, the factor costs and the entrepreneur's profit added to them give us the total income or proceeds resulting from a given amount of employment in a firm. Keynes carried this idea into macro-economics. We can calculate the aggregate income or total sale proceeds. This aggregate income or aggregate proceeds expected from a given amount of employment is called the **"Aggregate Demand Price"** of the output of that amount of employment, i.e., it represents expected receipts when a given volume of employment is offered to workers.

Entrepreneurs make decisions about the amount of employment they will offer to labour on the basis of the expectations of sales and expected profit which, in turn, depend upon the estimate of the total money (income) they will receive by the sale of goods produced at varying levels of employment. The sale proceeds which they expect to receive are the same as they expect the community to spend on their production.

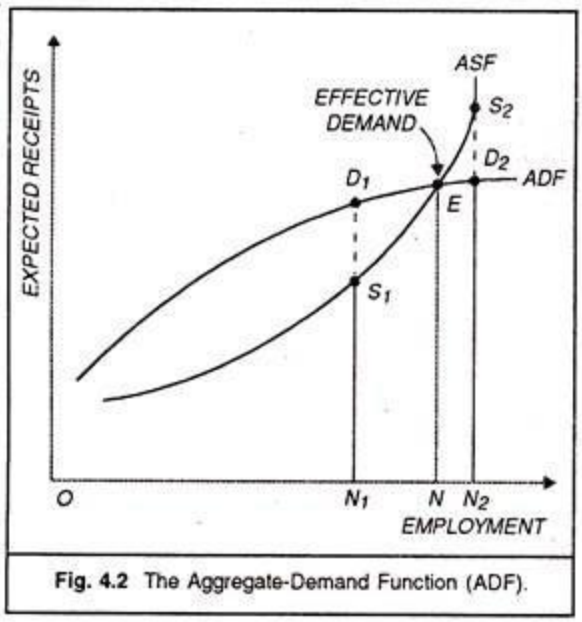


Fig. 4.2 The Aggregate-Demand Function (ADF).

A schedule of the proceeds expected from the sale of outputs resulting from varying amounts of employment is called the aggregate demand schedule or the aggregate demand Junction. The aggregate demand function shows the increase in the aggregate demand price as the amount of employment and hence output increases. Thus, the aggregate demand schedule is an increasing function of the amount of employment.

The question may reasonably be asked: why did Keynes relate expected sale proceeds with employment through output and why not with output directly?

Three possible reasons may be given for this:

(i) Keynes was mainly interested in the factors that go to determine employment rather than output;

(ii) To all intents and purposes employment and output move in the same direction in the short period;

(iii) The total production in the economy consists of a large variety of goods and there is no better measure of it than the labour employed.

Therefore, if D represents the proceeds expected by entrepreneurs from the employment of N men, the aggregate demand function can be written as D= f (N), which shows a relationship

between D and N. The aggregate demand function or demand schedule ADF is shown in the figure 4.2.

We find in the figure that the A Dadoes not start from the origin O because even at low levels of employment consumption will be much above income. As we move along the ADF curve to the right, we find that it is becoming flatter owing to the psychological law of consumption. But the ADF can never slope downwards simply because the absolute amount of consumption in the economy can never go down.

2. Aggregate Supply Function:

Aggregate supply is related to production done by firms. While providing employment to workers, entrepreneurs must feel assured that the output produced by them would be sold out and they will be able to recover their costs of production and get the expected profit margin also. A firm's output can sell at different prices depending on market conditions. But there are some proceeds of the output for which the entrepreneurs think it will just make worthwhile to provide a certain amount of employment.

The minimum expected sale proceeds of the output resulting from a given amount of employment are called the 'Aggregate Supply Price' of that output. In other words, these are the minimum expected proceeds which are considered just necessary to induce entrepreneurs to provide a certain amount of employment. For the economy as a whole at any given level of employment of labour, aggregate supply price is the total amount of (sale proceeds) which all the producers, taken together, must expect to receive from the sale of the output produced by that given number of men, if it is to be just worth employing them.

A schedule of the minimum amounts of proceeds required to induce entrepreneurs to give varying amounts of employment is called the aggregate-supply schedule. This is also an increasing function of the amount of employment. In other words, the minimum sale proceeds necessary go on rising as employment and output are raised. This is due to the rise in cost of production with increasing output, given the capital stock, the techniques of production and organization in the short run.

It is pertinent to observe here that in the aggregate demand function it is the expected sale proceeds that we consider and in the aggregate supply function it is the minimum sale proceeds necessary. There will be difference between them because at certain levels of employment (outputs), producers will expect more proceeds than the minimum sale proceeds necessary. There will be other levels of employment where the sale proceeds expected may be less than the sale proceeds necessary.

The Aggregate Supply Function ASF is shown in Figure 4.2 as rising from left upwards to the right gradually at first and then quickly. The ASF becomes vertical after the point S_2 because at this level of aggregate supply all those who want to be employed get employment. This point indicates full employment in the economy.

Determination of the Level of Employment:

In Fig. 4.2, ADF is the Aggregate Demand Function and ASF the Aggregate Supply Function. We show employment along X-axis and sale proceeds along Y-axis. The point E where the ADF curve is cut by the aggregate supply curve is called the point of effective demand. It may be noted that there are so many points on the aggregate demand curve ADF, but all these points are not effective except point E.

In the diagram, aggregate supply function shows the minimum proceeds which are just necessary to induce entrepreneurs to provide varying amounts of employment; the aggregate demand function shows the proceeds expected from the sale of outputs resulting from various amounts of employment.

Before these curves intersect each other at E, ASF lies below the ADF so that at the one level of employment the expected sale proceeds N_1D_1 are greater than the minimum sale proceeds necessary N_1S_1 showing that the employers will be induced to provide increased amount of employment. At point E, ADF is intersected by ASF' and entrepreneurs' expectations of proceeds are realised.

The point E is called the point of equilibrium as it determines the actual level of employment (ON) at a particular time in an economy. The level of employment ON_2 is not an equilibrium level because the sale proceeds expected N_2D_2 are less than the sale proceeds

necessary N_2S_2 at this level of employment. Most of the entrepreneurs will be disappointed and will reduce employment.

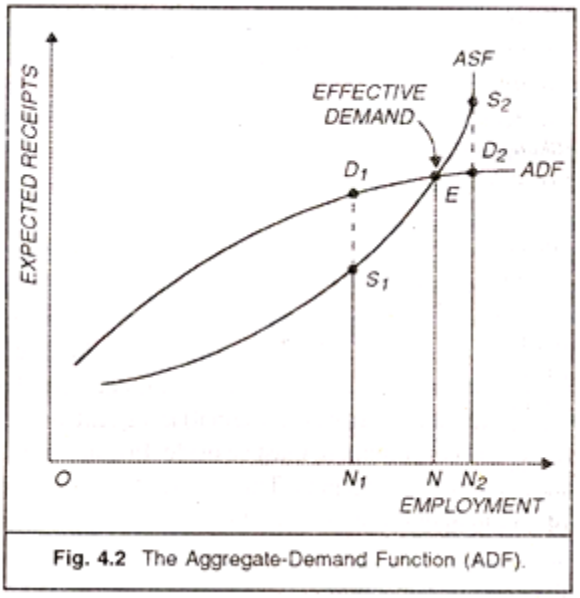


Fig. 4.2 The Aggregate-Demand Function (ADF).

Thus, we see that:

The intersection of the aggregate demand schedule with the aggregate supply schedule determines the actual level of employment m an economy and that at this level of employment, the amount of sale proceeds which the entrepreneurs expect to receive is equal to what they must receive if their 'costs' at that level of employment are to be just covered.

Underemployment Equilibrium:

It may, however, be noted that the economy is no doubt, in equilibrium at the point E, for here the entrepreneurs do not have the tendency either to increase or decrease employment. But Keynes makes a singular contribution to economic analysis by saying that E may or may not be a point of full employment equilibrium. If it is so very good.

If, however, some workers still remain unemployed when ADF and ASF are equalised, in that ease, it will be known as Underemployment Equilibrium. Keynes argued like this. Aggregate demand and aggregate supply might be equal at full employment; this will be so if investment happens to equal the gap between the aggregate supply price corresponding to full employment and the amount which consumers choose to spend on consumption out of full employment income.

Keynes believed that private investment in a capitalist economy is never sufficient to fill such a gap. As such, there is every likelihood that aggregate demand function and aggregate supply function may intersect at a point of less than full employment-called Underemployment Equilibrium.

If underemployment equilibrium is the common situation in the capitalist economy, then how can we achieve full employment 7 Keynes suggested that in the short period government can raise aggregate demand in the economy through public investment which is not profit-motivated.

Refer to Figure 4.3. Suppose the government makes an investment equal to D_2S_2 and this raises the ADF to the level ADF' and the demand function cuts the supply function at S_2. The vertical line from the point S_2 down on the horizontal axis shows that this policy of public investment would achieve the full employment ON_2 in the economy.

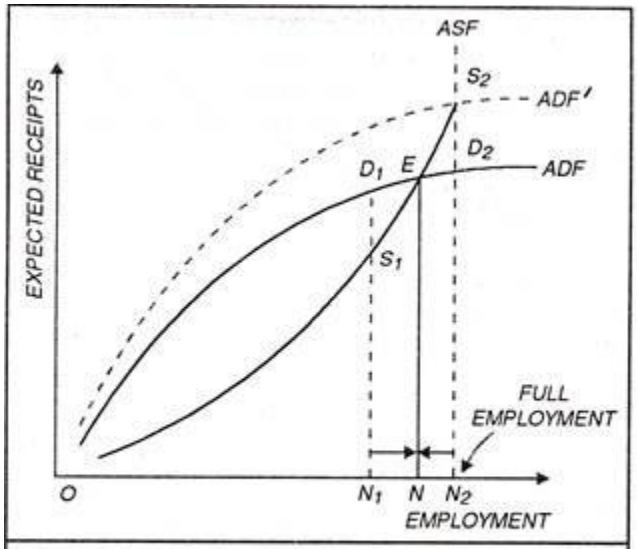


Fig. 4.3 Determination of Employment through the principle of Effective Demand.

Shapes of the ASF and ADF:

It is very' difficult to comment upon the shapes of Aggregate Demand Schedule and Aggregate Supply Schedule. Presuming, however, that the money prices of all goods are constant and employment and output rise and fall in proportion to each other, we can safely come to the conclusion that both the aggregate demand function and the aggregate supply function are

increasing functions of employment; then rise from left upwards to the right. The ADF rises at first rather steeply and then goes flatter and flatter.

This is because of (nature of the consumption function) MFC being less than one. The ISF rises slowly at first because of the available unemployed resources. As bottlenecks in production are faced, diminishing returns (increasing costs) become more prominent. Beyond the point of full employment, production cannot be increased at all. So the ASF which was rising steeply becomes vertical beyond the full employment point (S_2).

Relative Importance of ASF and ADF Functions:

Since the equilibrium level of employment is determined by the intersection of these two schedules, it would be useful to know some more details about the nature and character of these schedules. Of the two, there is little that is important about Aggregate Supply Function. Keynes gives scant attention to the aggregate supply function and concentrates more on aggregate demand function. For all practical purposes, he takes ASF as given because he deals with the short period and in the short period, supply conditions cannot be changed.

Moreover, in the General Theory, Keynes was concerned with an economy facing unemployment of resources during depression. Under such circumstances, there is little to gain from manipulating the technical conditions of production like costs, machines, and materials through schemes like rationalisation. Rationalisation results in more unemployment in the short period. It was because of these reasons that Keynes took ASF as given.

Since the supply conditions had to be taken as given. Keynes gave more importance to the aggregate demand function. Given the aggregate supply schedule, the resources in an economy would be fully utilised only if there is enough aggregate demand It is because of this that some economists call his theory of employment a ‘theory of aggregate effective demand’. Aggregate demand depends upon consumption and investment. If employment is to be expanded, expenditure on consumption and investment should be stepped up.

Thus, the shape and position of the aggregate demand function depend upon the total expenditure incurred by a community on consumption and investment taken together. Assuming, as Keynes docs, the aggregate supply function to be given, the pith and substance of his

argument in the General Theory is that employment is determined by aggregate demand, which in turn, depends on the propensity to consume and the amount of investment at a given time.

Effective Demand Versus Say's Law:

The classical theory failed in attempting to apply Say's law to the demand for investment. Whereas it is true that more employment creates more income out of which some will be spent on consumption, the entire increase in income will not be so spent and there is no reason to believe that the difference will be devoted to investment expenditure. Hence if investment does not increase with an increase in employment, the sum of consumption expenditure and investment would be less than the aggregate supply price for the higher level of employment.

Businessmen would reduce employment to a level at which the aggregate supply price exceeds the consumption demand by the actual amount of investment. Hence as long as the gap between income and consumption is not automatically filled up by investment (i.e. $Y = C + I$) Say's Law would not operate. It is here that we find Say's Law uprooted by the concept of Effective Demand as developed by Keynes.

Aggregate Demand in the Statistical Sense:

So far we have considered two determinants of effective demand, i.e., private consumption and private investment, but in modern capitalist societies Government expenditure has also become an additional important item. Thus, Effective demand = $C + I + G$, Keynes look no account of Government expenditure but post Keynesians treat it as an important constituent of effective demand.

Aggregate demand in the statistical sense is thus made up of:

(i) Private consumption expenditure,

(ii) Private investment expenditure,

(iii) Public investment expenditure,

(iv) Foreign expenditures on domestic goods and services, over and above domestic expenditure on foreign goods and services.

In this way, the aggregate demand is a flow of money expenditure on final output in a given period. All these are components of effective demand.

UNIT IV

Calculating the Consumption Function

The consumption function is represented as:

consumer spending

autonomous consumption

marginal propensity to consumereal disposable income

$C = A + MD$ **where:**

C=consumer spending

A=autonomous consumption

M=marginal propensity to consume

D=real disposable income

Consumption Function: Concept, Keynes's Theory and Important Features

Introduction:

Given the aggregate supply, the level of income or employment is determined by the level of aggregate demand; the greater the aggregate demand, the greater the level of income and employment and vice versa.

Keynes was not interested in the factors determining the aggregate supply since he was concerned with the short run and the existing productive capacity. We will also not explain in detail the factors which determine the aggregate supply and will confine ourselves to explaining the determinants of aggregate demand.

Aggregate demand consists of two parts—consumption demand and investment demand. In this article we will explain the consumption demand and the factors on which it

depends and how it changes over a period of time. Consumption demand depends upon the level of income and the propensity to consume. We shall explain below the meaning of the consumption function and the factors on which it depends.

The Concept of Consumption Function:

As the demand for a good depends upon its price, similarly consumption of a community depends upon the level of income. In other words, consumption is a function of income. The consumption function relates the amount of consumption to the level of income. When the income of a community rises, consumption also rises.

How much consumption rises in response to a given increase in income depends upon the marginal propensity to consume. It should be borne in mind that the consumption function is the whole schedule which describes the amounts of consumption at various levels of income.

We give below such a schedule of consumption function:

Table 6.1. Linear Consumption Function:

Income (Rs. in crores) Y	*Consumption (Rs. in crores)* C	*Average Propensity to Consume* $\left(\frac{C}{Y}\right)$	*Marginal Propensity to Consume* $\left(\frac{\Delta C}{\Delta Y}\right)$
1000	750	$\frac{750}{1000} = 0.75$	—
1100	825	$\frac{825}{1100} = 0.75$	$\frac{75}{100} = .75$
1200	900	$\frac{900}{1200} = 0.75$	$\frac{75}{100} = .75$
1300	975	$\frac{975}{1300} = 0.75$	$\frac{75}{100} = .75$
1400	1050	$\frac{1050}{1400} = 0.75$	$\frac{75}{100} = .75$
1500	1125	$\frac{1125}{1500} = 0.75$	$\frac{75}{100} = .75$
1600	1200	$\frac{1200}{1600} = 0.75$	$\frac{75}{100} = .75$

Consumption function should be carefully distinguished from the amount of consumption. By consumption function is meant the whole schedule which shows consumption at various levels of income, whereas amount of consumption means the amount consumed at a specific level of income. The schedule described above reflects the consumption function of a community i.e., it indicates how the consumption changes in response to the change in income.

In the above schedule it will be seen that at the level of income equal to Rs. 1200 crores, the amount of consumption is Rs. 900 crores. As the national income increases to Rs. 1500 crores, the consumption rises to Rs. 1125 crores. Thus, with a given consumption function, amount of consumption is different at different levels of income.

The above schedule of consumption function reveals an important fact that when income rises, consumption also rises but not as much as the income. This fact about consumption function was emphasised by Keynes, who first of all evolved the concept of consumption function. The reason why consumption rises less than income is that a part of the increment in income is saved.

Therefore, we see that when income increases from Rs. 1000 crores to Rs. 1100 crores, the amount of consumption rises from Rs. 750 crores to 825 crores. Thus, with the increase in income by Rs. 100 crores, consumption rises by Rs. 75 crores; the remaining Rs. 25 crores are saved. Similarly, when income rises from Rs. 1100 crores to Rs. 1200 crores, the amount of consumption increases from Rs. 825 crores to Rs. 900 crores.

Here also, as a result of increase in income by Rs. 100, the amount of consumption has risen by Rs. 75 crores and the remaining Rs. 25 crores has been saved. The same applies to further increases in income and consumption. We shall see later that Keynes based his theory of multiplier on the proposition that consumption increases less than income and this theory of multiplier occupies an important place in macroeconomics.

Consumption demand depends on income and propensity to consume. Propensity to consume depends on various factors such as price level, interest rate, stock of wealth and several subjective factors. Since Keynes was concerned with short-run consumption function he assumed price level, interest rate, stock of wealth etc. constant in his theory of consumption. Thus with these factors being assumed constant in the short run, Keynesian consumption function considers consumption as a function of income. Thus

$$C = f(Y)$$

In a specific form, Keynesian function can be written as:

$$C = a + f(Y)$$

where a and b are constants. While a is intercept term of the consumption function, b stands for the slope of the consumption function and therefore represents marginal propensity to consume.

Keynesian consumption function has been depicted by CC' curve in Fig. 6.1 in which along the X-axis national income is measured and along the Y-axis the amount of consumption is measured. In this figure, a line OZ making 45° angle with the X-axis, has been drawn. Because line OZ makes 45° angle with the X-axis every point on it is equidistant from both the X-axis and Y-axis.

Therefore, if consumption function curve coincides with 45° line OZ it would imply that the amount of consumption is equal to the income at every level of income. In this case, with the increase in income, consumption would also increase by the same amount.

As has been said above, in actual practice consumption increases less than the increase in income. Therefore, in actual practice the curve depicting the consumption function will deviate from the 45° line. If we represent the above consumption schedule by a curve, we would get the propensity to consume curve such as CC in Fig. 6.1.

It is evident from this figure that the consumption function curve CC' deviates from the 45° line OZ. At lower levels of income, the consumption function curve CC lies above the OZ line, signifying that at these lower levels of income consumption is greater than the income.

It is so because at lower levels of income, a nation may draw upon its accumulated savings to maintain its consumption standard or it may borrow from others. As income increases, consumption also increases and at the income level OY_0, consumption is equal to income.

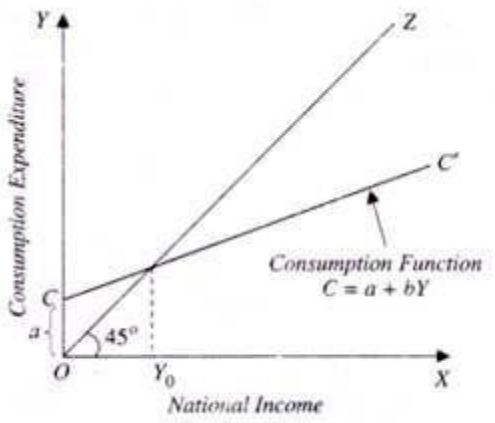


Fig. 6.1. *Keynesian Linear Consumption Function*

Beyond this, with the increase in income, consumption increases but less than the increase in income and therefore, consumption function curve CC lies below the 45° line OZ beyond Y_0. An important point to be noted here is that beyond the level of income OY_0, the gap between consumption and income is widening. The difference between consumption and income represents savings. Therefore, with the increase in income, saving gap also widens and as we shall see later, this has a significant implication in macroeconomics.

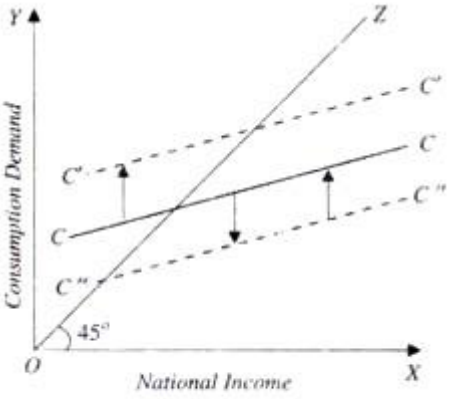


Fig. 6.2. *Shift in Consumption Function*

It is useful to point out here that when the consumption function of a community changes, the whole consumption function curve changes or shifts. When propensity to consume increases, it means that at various levels of income more is consumed than before.

Therefore, as a result of increase in propensity to consume of the community, the whole consumption function curve shifts upward as has been shown by the upper curve C'C' in Fig. 6.2. On the contrary, when the propensity to consume of the community decreases, the whole

consumption function curve shifts downward signifying that at various levels of income, less is consumed than before.

Keynes's Psychological law of Consumption

This law says "that men are disposed as a rulev and on the average to increase their consumption as their income increases but not by as much as the increase in their income".

Three related Propositions

1. When Income increases, consumption expenditure also increases but by a smaller amount. Thus, it increases less than proportionately.

2. The increased income will be divided in some proportion between consumption expenditure and saving.

3. Increase in income always leads to increase in both consumption and saving.

Average and Marginal Propensity to Consume:

There are two important concepts of propensity to consume, the one being average propensity to consume and the other marginal propensity to consume. They should be carefully distinguished, for they are equal in some cases but different in others. Consider Table 6.1, where we have calculated the average and marginal propensity to consume in columns 3 and 4. As seen above, consumption changes as income changes.

Now, how much consumption changes in response to a given change in income depends upon the average and marginal propensity to consume. Thus, propensity to consume of a community can be known by the average and marginal propensity to consume. Average propensity to consume is the ratio of the amount of consumption to total income. Therefore, average propensity to consume is calculated by dividing the amount of consumption by the total income. Thus,

APC = C/Y, where

APC stands for average propensity to consume,

C for amount of consumption, and

F for the level of income.

In the Table 6.1 it will be seen that at the level of income Rs 1000 crores, consumption expenditure is equal to Rs. 750 crores. Therefore, average propensity to consume is here equal to 750/1000 = 0.75. Likewise, when the income rises to Rs. 1200 crores, consumption rises to Rs. 900 crores.

Therefore, the average propensity to consume will be 900/1200 = 0.75. In this schedule of consumption function, the average propensity to consume is the same at all levels of income. Keynesian consumption function CC is shown in Fig. 6.3.

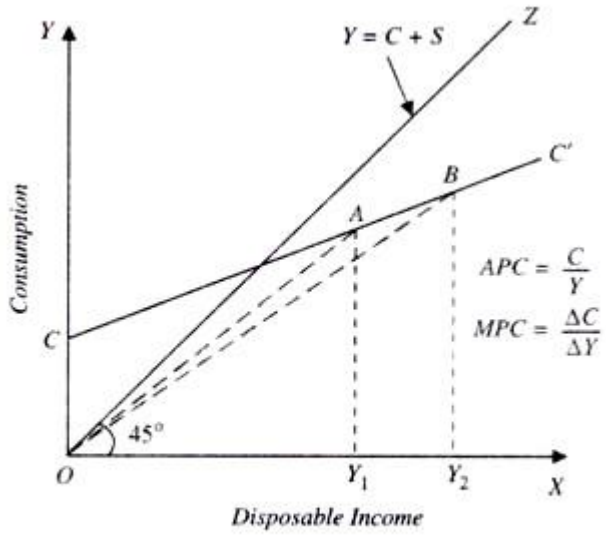


Fig. 6.3. *Consumption Function: Declining Average Propensity to Consume*

Average propensity to consume at a point on the consumption function curve can be obtained by measuring the slope of the ray from the origin to that point. For example, at income level OY_1 corresponding point on the consumption function curve is A. Therefore, at OY_1 income level, average propensity to consume (APC) is the slope of the ray OA.

Similarly, at income level OY_2, average propensity to consume is the slope of the ray OB. It will be observed from Fig.6.3 that slope of OB is less than that of OA. Therefore, average

propensity to consume at income level OY_2 is less than that at income level OY_1. In other words average propensity to consume has declined with the increase in disposable income.

Non-Linear Consumption Function: Average and Marginal Propensity to Consume:

In the consumption function depicted in Fig. 6.3, though average propensity to consume (C/Y) declines, marginal propensity to consume which equals $\Delta C/\Delta Y$ remains constant since consumption function curve CC' is a straight line and therefore its slope ($\Delta C/\Delta Y$) is constant.

But it is not necessary that marginal propensity to consume should be the same at all levels of income. We have constructed below another schedule of consumption function in which marginal propensity to consume declines with the increase in income.

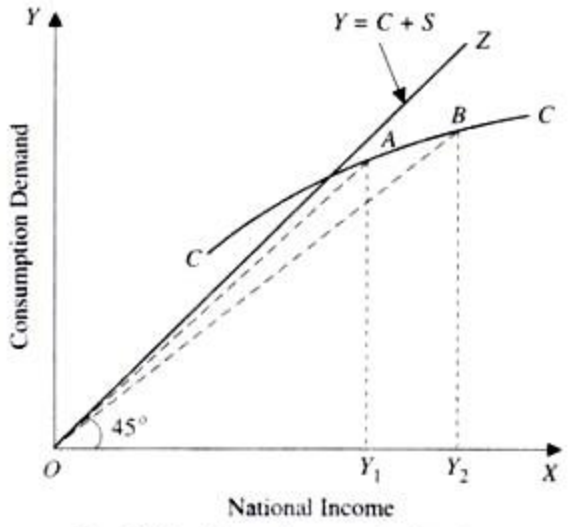


Fig. 6.4. *Non-Linear Consumption Function: Declining Average Propensity to Consume*

It will be seen from Table 6.2 that at the level of income of Rs. 100 crores, marginal propensity to consume is 0.9, and when income rises to Rs. 1500 crores, the marginal propensity to consume has declined to 0.5. When with the increase in income both marginal propensity to consume and average propensity to consume decline, then the curve of consumption function is not a straight line but has a shape as shown in Fig. 6.4.

From any point on the propensity to consume curve CC we can find out average propensity to consume by joining that point with the point of origin by a straight line whose slope will measure the average propensity to consume.

In Fig. 6.4, if we have to find out average propensity to consume at point A on the consumption function curve CC', we connect point A with the origin by a straight line. Now, the slope of the line OA i.e., AY_1/OY_1 will indicate the average propensity to consume.

Similarly, at point B of the given consumption function CC', the average propensity to consume will be given by the slope of the line OB which is equal to BY_2/OY_2. The glance at the figure will show that the slope of the line OB is smaller than the slope of the line OA. Therefore, average propensity to consume at point B or at income level OY_2 is less than that at point A or income level OY_1.

Table 6.2. Non-Linear Consumption Function: Average and Marginal Propensity to Consume:

Income (Rs. in crores) Y	*Consumption (Rs. in crores)* C	*Average Propensity to Consume* $\frac{C}{Y}$	*Marginal Propensity to Consume* $\frac{\Delta C}{\Delta Y}$
1000	950	$\frac{950}{100} = 0.950$	–
1100	1040	$\frac{1040}{1100} = 0.945$	$\frac{90}{100} = 0.9$
1200	1120	$\frac{1120}{1200} = 0.933$	$\frac{80}{100} = 0.8$
1300	1190	$\frac{1190}{1300} = 0.915$	$\frac{70}{100} = 0.7$
1400	1250	$\frac{1250}{1400} = 0.893$	$\frac{60}{100} = 0.6$
1500	1300	$\frac{1300}{1500} = 0.866$	$\frac{50}{100} = 0.5$

Marginal Propensity to Consume:

The concept of marginal propensity to consume is very important, because from it we can know how much part of the increment in income is consumed and how much saved. Marginal propensity to consume is the ratio of change in consumption to the change in income.

Thus:

$MPC = \Delta C/\Delta Y$

where, MPC stands for marginal propensity to consume,

ΔC for change in consumption, and

ΔY for change in income.

Marginal propensity to consume needs to be carefully distinguished from average propensity to consume. Whereas average propensity to consume is the ratio of total consumption to total income, i.e., C/Y, the marginal propensity to consume is the ratio of change in consumption to the change in income, i.e. $\Delta C/\Delta Y$.

The concept of marginal propensity to consume can be easily understood with the aid of Table 6.2, in column 4 of which we have calculated the marginal propensity to consume at various levels of income. In this schedule when income rises from Rs. 1000 crores to Rs. 1100 crores, the consumption increases from Rs. 950 crores to Rs. 1040 crores. Here the increment in income is Rs. 100 crores and the increment in consumption is Rs. 90 crores. Therefore, marginal propensity to consume which is $\Delta C/\Delta Y$ is here equal to 90/100 or 0.9.

Similarly, when national income rises to Rs. 1200 crores and as a result consumption increases from Rs. 1040 crores to Rs. 1120 crores, the marginal propensity to consume is now equal to 80/100 or 0.8. In Table 6.2, it will be seen that marginal propensity to consume declines as the income rises.

It is worth noting that when with the increase in income average propensity to consume declines, marginal propensity to consume is less than average propensity to consume. This is- in accordance with the usual relationship between the average and marginal quantities. This is evident from Table 6.2.

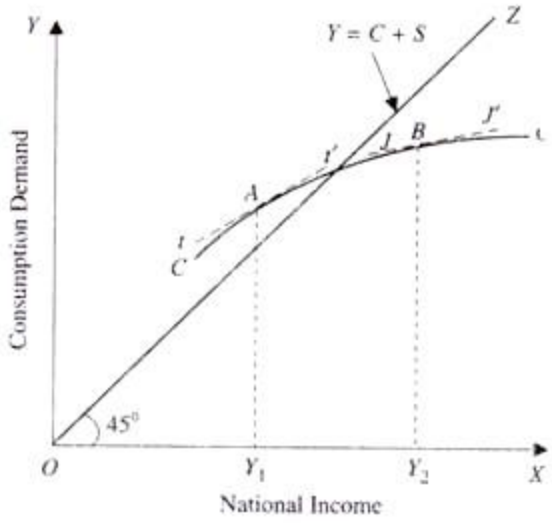


Fig. 6.5. *Non-Linear Consumption Function: Marginal Propensity to Consume*

But when average propensity to consume remains constant as in Table 6.1, marginal propensity to consume is equal to it. In Table 6.1, average propensity to consume remains constant at 0.75 and from its 4th column it will be seen that marginal propensity to consume is also 0.75.

Marginal propensity to consume can be estimated by drawing the tangent at a point on the consumption function. Consider Fig. 6.5 where curve CC depicting the consumption function has been drawn. Marginal propensity to consume at point A on this will be equal to the slope of the tangent tt' drawn at this point.

Similarly, marginal propensity to consume at point B on it is given by the slope of the tangent JJ' drawn at this point. It will be seen that slope of the tangent JJ' is less than the slope of the tangent tt'. Therefore, marginal propensity to consume at point B on the consumption function CC in Fig. 6.5 is smaller than the marginal propensity to consume at point A on this consumption function.

Thus, marginal propensity to consume is declining with the increases in income in the non-linear consumption function curve CC in Fig. 6.5. Thus when marginal propensity to consume declines with the increase in income, consumption function is non-linear whose slope declines as income rises. Non-linear consumption function is shown in Fig. 6.5 where the slope of the propensity to consume curve CC declines as income increases.

In Fig. 6.1 and Fig. 6.3 propensity to consume curve is a straight line i.e., the slope of the consumption function curve remains constant. Therefore, marginal propensity to consume which is given by the slope of the propensity to consume curve remains constant in Fig. 6.1.

It is worth noting that marginal propensity to consume is neither zero nor equal to one. It has been found by empirical studies that marginal propensity to consume varies between zero and unity. If the marginal propensity to consume was zero, then the whole of the increment in income would have been saved and the consumption function curve would have a horizontal shape.

As we have seen before, this is not so realistic. On the other hand, if the marginal propensity to consume was equal to unity, then the whole of the increment in income would be consumed and in that case consumption function curve would have coincided with 45° line.

Saving Function:

As mentioned above, consumption increases as income increases but less than the rise in income. We will now explain what happens to saving when income increases. Saving is defined as the part of income which is not consumed because disposable income is either consumed or saved.

Thus,

$$Y = C + S$$

$$S = Y – C$$

where Y = Disposable income, C = Consumption, S = Saving

Like consumption, saving is also a function of income. Thus, saving function can be written as

$$S= f(Y)$$

Saving function is a counterpart of a consumption function, Therefore, given a particular consumption, function, we can derive the corresponding saving function. Let us take the Keynesian consumption, namely, C = a + bY. We can derive saving function corresponding to it.

Since Y = C + S

S = Y – C

Now, substituting the above Keynesian function for C in (i) we have

S = Y – (a + bY)

= Y – a – bY

= – a + Y – bY

= – a + (1 – b) Y

Note that (1 – b) in the above saving function in (ii) is the value of marginal propensity to save where b is the value of marginal propensity to consume. Let us give a numerical example. Suppose the following consumption function is given.

C = 150 + 0.80 Y

S = Y – C

Substituting the given consumption function for C we have

S = Y – 150 – 0.80 Y

= – 150 + Y – 0.80 Y

= 150 + (1 – 0.80) Y

= – 150 + 0.20 Y

Note that 0.20 represents marginal propensity to save. It also follows from above that the sum of marginal propensity to consume and marginal propensity to save is equal to one (MPC + MPS – 1). It is important to distinguish between average propensity to save and marginal propensity to save.

Average propensity to save:

An important relationship between income and saving is described by the concept of average propensity to save. (APS). Average propensity to save is the proportion of disposable income that is saved (i.e. not consumed). Mathematically

APS = Savings/Disposable Income = S/Y

Like the average propensity to consume (APC) average propensity to save also generally varies as income increases. As seen above, average propensity to consume (APC) falls as income increases. This implies that average propensity to save will increase as income rises.

Let us derive an important relationship between average propensity to consume and average propensity to save.

Restating below the relation that income is either consumed or saved:

$$C + S = Y$$

Dividing both sides by disposable income Y we have

$$C/Y + S/Y + Y/Y = 1$$

Since C/Y is average propensity to consume and S/Y is average propensity to save, we have

$$APC + APS = 1$$

or $$APS = 1 – APC$$

This means for example, that if a society consumes 75 per cent of its disposable income, that is, APC = 0.75, then it will save 25 per cent of its disposable income or its average propensity to save (APS) will be 0.25 (1 – 0.75 = 0.25).

In Fig. 6.6 we have drawn the saving curve SS in the panel at the bottom. The saving curve SS shows the gap between consumption curve CC and the income curve OZ in the upper panel of Fig. 6.6. It will be seen that up to income level OY_1 consumption exceeds income, that is, there is dissaving.

Beyond income level OY_1, there is positive saving. It is worth mentioning that as average propensity to consume (APC) falls with the increase in income in the upper panel average propensity to save rises as income increases. Thus in Fig. 6.6 with the increase in income not only the absolute amount of saving increases, the average propensity to save also increases.

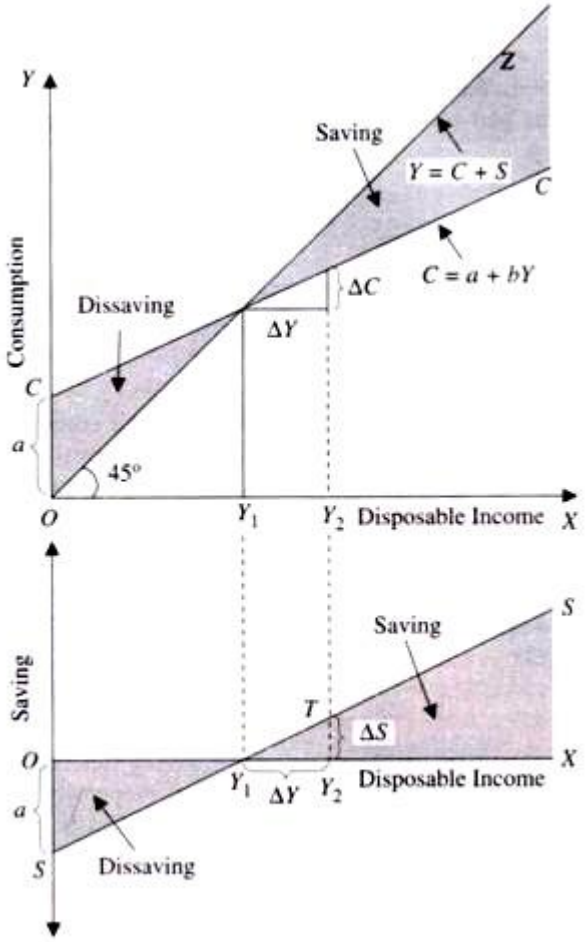


Fig. 6.6. *Saving Function derived from Consumption Function*

Marginal Propensity to Save (MPS):

Whereas average propensity to save indicates the proportion of income that is saved, marginal propensity to save represents how much of the additional disposable income is devoted to saving. The marginal propensity to save is therefore change in savings induced by a change in the disposable income.

Thus,

$$MPS = \Delta S/\Delta Y$$

For example, if disposable income increases from rupees 10,000 to 12,000 and this causes planned savings to increase by Rs. 500 crores, marginal propensity to save is:
MPS = 500/2000 = 1/4 = 0.25

Since the additional income is either consumed or saved, the sum of marginal propensity to consume and marginal propensity to save is equal to one.

$$MPC + MPS = 1$$

This can be mathematically proved as under

From C + S = Y, it follows that any change in income (AF) must induce either change in consumption (AC) or change in saving (AS). Thus.

$$\Delta C + \Delta S = \Delta Y$$

Dividing both sides by ΔY we have

$$\Delta C/\Delta Y + \Delta S/\Delta Y = \Delta Y/\Delta Y = 1$$

$$MPC + MPS = 1$$

The concept of marginal propensity to save is graphically shown at the bottom of Fig. 6.6. It will be seen from this figure that when disposable income increases from OY_1 (say Rs. 10,000) to OY_2 (say Rs. 12,000), that is, ΔY = Rs. 2000, the saving increases by Y_2T, (Rs. 500), that is, ΔS is Rs. 500. Thus marginal propensity to save (MPS) is
$\Delta S/\Delta Y = Y_2T/Y_1Y_2 = 500/2000 = 1/4 = 0.25$

Keynes's Theory of Consumption:

Keynes in his "General theory", published in 1936, laid the foundations of modern macroeconomics. The concept of consumption function plays an important role in Keynes'

theory of income and employment. Keynes mentioned several subjective and objective factors which determine consumption of a society. However, according to Keynes, of all the factors it is the current level of income that determines the consumption of an individual and also of society.

Since Keynes laid stress on the absolute size of current income as a determinant of consumption, his theory of consumption is also known as absolute income theory of consumption. Further, Keynes put forward a psychological law of consumption, according to which, as income increases consumption increases but not by as much as the increase in income. In other words, marginal propensity to consume is less than one.

$$1 > \Delta C/\Delta Y > 0$$

While Keynes recognized that many subjective and objective factors including interest rate and wealth influenced the level consumption expenditure, he emphasised that it is the current level of income on which the consumption spending of an individual and the society depends.

Assumptions and Implications

Much of the Keynesian doctrine centers around the frequency with which a given population spends or saves new income. The multiplier, the consumption function, and the marginal propensity to consume are each crucial to Keynes' focus on spending and aggregate demand.

The consumption function is assumed stable and static; all expenditures are passively determined by the level of national income. The same is not true of savings, which Keynes called "investment," not to be confused with government spending, another concept Keynes often defined as investment.

For the model to be valid, the consumption function and independent investment must remain constant long enough for national income to reach equilibrium. At equilibrium, business expectations and consumer expectations match up. One potential problem is that the consumption function cannot handle changes in the distribution of income and wealth. When these change, so too might autonomous consumption and the marginal propensity to consume.

Determinants of Consumption Function

1.Subjective factors (endogenous or internal tov the economic system).

2. Psychological characteristics of human nature.

3. Social practices.

4. Behaviour Pattern of Business concerns

5. Social arrangements affecting distribution of income. On the basis of above characteristics there can be individual as well as Business Motives.

To quote him:

"The amount of aggregate consumption depends mainly on the amount of aggregate income. The fundamental psychological law, upon which we are entitled to depend with great confidence both a priori from our knowledge of human nature and from (the detailed facts of experience is that men (and women, too) are disposed, as a rule and on an average to increase their consumption as their income increases, but not by as much as the increase in their income."

In the above statement about consumption behaviour, Keynes makes three points. First, he suggests that consumption expenditure depends mainly on absolute income of the current period, that is, consumption is a positive function of the absolute level of current income. The more income in a period one has, the more is likely to be his consumption expenditure in that period. In other words, in any period the rich people tend to consume more than the poor people do. Secondly, Keynes points out that consumption expenditure does not have a proportional relationship with income.

According to him, as the income increases, a smaller proportion of income is consumed. The proportion of consumption to income is called average propensity to consume (APC). Thus, Keynes argues that average propensity to consume (APC) falls as income increases.

The Keynes' consumption function can be expressed in the following form

$$C = a + bY_d$$

where C is consumption expenditure and Y_d is the real disposable income which equals gross national income minus taxes, a and b are constants, where a is the intercept term, that is, the amount of consumption expenditure at zero level of income. Thus, a is autonomous consumption. The parameter b is the marginal propensity to consume (MPC) which measures the increase in consumption spending in response to per unit increase in disposable income. Thus

$$MPC = \Delta C/\Delta Y$$

Since the average propensity to consume falls as income increases, the marginal propensity to consume (MPC) is less than the average propensity to consume (APC). The Keynesian consumption function is depicted in Figs. 6.3.

In Fig. 6.3 we have shown a linear consumption function with an intercept term. In this form of linear consumption function, though marginal propensity to consume ($\Delta C/\Delta Y$) is constant, average propensity to consume is declining with the increase in income as indicated by the slopes of the lines OA and OB at levels of income Y_1 and Y_2 respectively. The straight line OB drawn from the origin indicating average propensity to consume at higher income level Y_2 has a relatively less slope than the straight line OA drawn from the origin to point A at lower income level Y_1.

The decline in average propensity to consume as the income increases implies that the proportion of income that is saved increases with the increase in national income of the country. This result also follows from the studies of family budgets of various families at different income levels. The fraction of income spent on consumption by the rich families is lower than that of the poor families. In other words, the rich families save a higher proportion of their income as compared to the poor families.

The assumption of diminishing average propensity to consume is a significant part of Keynesian theory of income and employment. This implies that as income increases, a progressively larger proportion of national income would be saved. Therefore, to achieve and maintain equilibrium at full-employment level of income, increasing proportion of national income is needed to be invested.

If sufficient investment opportunities are not available, the economy would then run into trouble and in that case it would not be possible to maintain full-employment because aggregate demand will fall short of full-employment output. On the basis of this increasing proportion of saving with the increase in income and consequently, the emergence of the problem of demand deficiency, some Keynesian economists based the theory of secular stagnation on the declining propensity to consume.

Determinants of Propensity to Consume:

The important question is on what factors the propensity to consume of a community depends. In other words, what are the factors that determine the level and position of the propensity to consume or the consumption function? Keynes divided the factors determining the propensity to consume into two groups: the first group of factors was called by him as subjective factors and the second group was named by him as objective factors. We shall explain below in detail these subjective and objective factors which affect the consumption function of a community.

Subjective Factors:

Among the subjective factors are included those factors which induce and prompt people to save some part of their income. First, people save because they want to provide for unforeseen contingencies, such as illness, unemployment, accidents, etc. Secondly, people are induced to save because they want to provide for the expected future needs such as education of the children, marriages of their children, etc.

Thirdly, several people wish to save from their current incomes so that they may be able to use accumulated savings for investment which will increase their future income. Investments will bring them more income in the form of more profits and interest. Fourthly, people are motivated to save so that they can accumulate large wealth which will increase their social status.

With increased wealth they would think themselves to be economically more independent and they could buy many things with more wealth. Further, many individuals also save so that they can use them for speculative purposes and other business projects.

Besides, several people are prompted to save for the sake of leaving a good fortune for their heirs and children. Lastly, many people save because of their miserly instinct and habits. The accumulation of more wealth gives them a great psychic satisfaction.

The above subjective factors increase the propensity to save and therefore reduce the propensity to consume. These subjective factors play a crucial rule in determining the level and shape of the consumption function. However, Keynes pointed out and rightly so that some subjective factors raise the propensity to consume.

The desire for ostentation generally leads to greater consumption expenditure. People have a natural in stint to imitate others' consumption habits. As pointed out by Duesenberry, people in lower and middle income ranges imitate the consumption standards of the higher income groups and this increases their propensity to consume. This has been called demonstration effect which is a great subjective or psychological force that works in raising the propensity to consume.

Subjective factors also lead the business firms to save much or little from their incomes.

Many of the subjective factors which influence the savings of the firms are the following:

(1) Enterprise:

Many business industrial firms desire to save a part of their current income so that they can make investment in new enterprises and carry out expansion in the future. Business firms generally save a good part of their income for their further expansion.

(2) Liquidity:

Business firms also are induced to save so that they can face contingencies in the future. If they have good amount of liquid wealth in their hands, they would be able to meet the emergent situations more successfully. More cautious and farsighted firms will save more than others on this count.

(3) Successful Management:

Many managers of the business firms are motivated to save more because they want prove themselves successful managers. With the investment of the saved money, the income of a firm increases and their managers are regarded as successful.

(4) Financial Prudence:

Business firms desire to save for making up the depreciation in plant and machinery. Since after some years business firms have to replace their plant and machinery, if a good part of their current income is not saved, it would not be possible for them to replace plant and machinery.

If the firms put aside a greater part of their income for depreciation or replacement purposes, they would pay lower dividends to the shareholders and this will generally lower the propensity to consume of a community.

On the other hand, if the firms keep a relatively small amount for depreciation, they will pay larger amounts as dividends to the shareholders and this will generally increase the propensity to consume of the community. Lastly, firms also want to save because they have to repay their debts.

Objective Factors:

Keynes mentioned the following six types of objective factors which influence the consumption function:

(1) Changes in the General Price Level: Real Balance Effect:

The general price level is an important factor which influences the consumption of a community. When the general price level increases or, in other words, when inflation occurs, the consumption function shifts downward. This is because the rise in the general price level, real value (that is, purchasing power) of people's money balances and financial assets with fixed monetary values declines.

This causes a downward shift in the consumption function. This is called real balance effect. Similarly, when the general price level falls, real value of money balances and financial

assets increases. This will induce people to consume relatively more out of their current income. This will cause an upward shift in the consumption function.

(2) Fiscal Policy:

Fiscal policy of the Government, especially taxation policy affects the propensity to consume of the country. By levying excise duties, sales tax, the Government can cut down the consumption and thereby increase savings of the community.

Likewise, when the Government reduces taxes, consumption of the people increases and this raises the propensity to consume. Rationing and price control by the Government also affects the propensity to consume, as was witnessed during the Second World War.

In the modern times, pursuing of the welfare state policy by the Government under which progressive taxes have been levied on the rich people and the revenue obtained from them have been spent to provide many social security benefits and amenities to the poor people, has tended to raise the consumption function.

(3) Rate of Interest:

Rate of interest also affects the propensity to consume and save. It is generally believed that higher rate of interest induces the people to save more and this results in reducing their propensity to consume. But this is not true in the case of all the people. Some individuals are of such a type who wants a certain fixed income in the future.

And when the rate of interest rises these individuals consume more and save less because with higher rate of interest they can obtain the given fixed income with lesser savings. Therefore, when the rate of interest rises such individuals save less than before. Thus, it cannot be said with certainty whether with the changes in the rate of interest the propensity to consume of the whole community will change or not.

(4) Stock of Wealth:

The stock of wealth owned by the households in the economy is also an important factor that determines propensity to consume. In wealth we include not only real assets such as land,

houses, automobiles but also financial assets such as cash balances, saving and fixed deposits with banks, stocks and bonds possessed by households. The greater the amount of wealth accumulated by households in the economy, the greater is generally the propensity to consume (i.e. the greater the amount of consumption out of any level of current income).

The important motive of the people to save is to accumulate wealth. Generally speaking, the greater the wealth which people have accumulated, the weaker is the incentive to save further. In other words, the other things remaining the same the increase in wealth generally causes an upward shift in the consumption function and decrease is wealth causes a downward shift in the consumption function.

An important example which is often cited to emphasise the importance of wealth as a determinant of consumption is the stock market crash of 1929 in England (i.e. drastic fall in share prices) which substantially reduced the financial wealth of the households overnight resulting in shifting the consumption function downward.

(5) Credit Conditions and Consumer Indebtedness:

The availability of easy credit causes an increase in consumption and shifts the consumption function upward. It is now a common experience in India that in recent years lowering of lending interest rates by Indian banks on loans for houses, cars, computers and other durable consumer goods has greatly increased the consumption of the people and shifted consumption function upward.

On the other hand, tightening of credit produces an opposite effect, that is, causes a downward shift in the consumption function, Furthermore, the recent increase in facilities of Credit Cards by banks and their acceptance buy sellers of consumer goods have also worked to shift the consumption function upward in India.

Similarly, the level of consumer indebtedness also greatly affects the propensity to consume of the people. If the households are heavily indebted, say 25 to 30 per cent of their current, they are committed to save (i.e. consume less) to that extent so that they are able to pay

their installments of previous credit taken. Thus, the greater the degree of indebtedness of households in the economy, the higher will be the consumption function curve and vice versa.

(6) Income Distribution:

Lastly, distribution of income in a society also determines the level of consumption function. If national income is more unequally distributed, the lower will be the propensity to consume. This is because propensity to consume of the rich is relatively less as compared to that of the poor. Therefore, if inequalities in income distribution increase, this reduces the consumption out of any given level of national income and thus causes a downward shift in the consumption function.

(7) Windfall Gains and Losses:

Windfall gains and losses also affect the propensity to consume. When the prices of the shares go up, the shareholders begin to think themselves better off and this raises their consumption. On the other hand, when the prices of the shares go down, the shareholders have to suffer sudden losses and they begin to think themselves relatively poorer than before. This induces them to reduce their consumption. We thus see that the windfall gains and losses affect the propensity to consume.

(8) Change in Expectations:

Changes in the expectations of the people also influence the propensity to consume. When people expect that war will break out in the near future and they expect prices to go up, then they will try to spend more on goods so as to meet the needs of the immediate future.

This raises the consumption function in the current period. On the other hand, when people expect the prices to fall they reduce their current consumption so that they should spend more when the prices actually fall.

We have explained above various subjective and objective factors which taken together determine the consumption function of a community. It is worth noting that propensity to consume does not generally change in the short run, because it depends more on psychological and institutional factors which change only in the long run.

The institutional factors which determine the distribution of income in the society are important forces determining the consumption function. And these institutional factors do not change in the short run. Therefore, Keynes was of the view that consumption function remains stable in the short run.

Important Features of Keynes' Consumption Function:

In macroeconomics, Keynes's consumption function plays a highly important role. Therefore, it is essential to state its important features.

The following are the important features of Keynes's consumption function:

1. First, absolute level of current income is the important factor that determines consumption of the community. Increase in national income causes an increase in consumption. On the other hand, classical economists thought that it was rate of interest that primarily determined saving and consumption of the community. A rise in rate of interest induces the people to save more and thus to reduce their level of consumption.

According to Keynes, though rate of interest is one of the factors that determine consumption of the community, he did not consider it a very important determinant of it. By considering level of current income as the most important factor determining consumption and saving, Keynes made a significant contribution to the macroeconomic theory.

2. The second important feature of Keynes' consumption function is that marginal propensity to consume is less than one but greater than zero ($0 < MPC < 1$). As has been explained above, the feature of Keynes's consumption function that marginal propensity to consume is less than one is known as Keynes's psychological law of consumption. According to this law, as income increases, consumption increases but not as much as the increase in income.Keynes's theory of multiplier is based on the marginal propensity to consume being less than one but greater than zero.

3. In Keynes consumption function, namely, $C = a + by$, as income increases, average propensity to consume (APC) falls. Keynes was of the view that rich people relatively save a higher proportion of their income so that at higher levels of income average propensity to

consume (APC), that is, proportion of total consumption to national income falls as national income rises.

4. Another important feature of consumption function as put forward by Keynes is that it remains stable in the short run. Consumption function, according to Keynes, depends on various institutional factors such as distribution of income and wealth and psychological factors such as willingness to save.

Since there cannot be much changes in these institutional and psychological factors, consumption function remains stable in the short run, that is, it does not shift upward or downward. Therefore, Keynes in his theory explains the determination of income and employment in the short run by considering that the consumption function is stable.

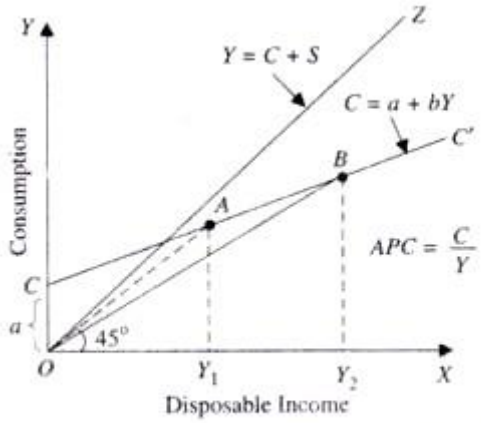


Fig. 6.7. *Keynes Consumption Function: Falling Average Propensity to Consume*

We shall critically examine Keynes's consumption function and compare it with other theories of consumption function.

Consumption Function Puzzle: Keynes' Consumption Function and Kuznets Findings:

Empirical studies of long-term times series data of the US economy for the period 1869-1938 made by the noted American economist Kuznets estimated a consumption function which

contradicts Keynes' consumption function which was found to be correct on the basis of cross-section studies of household budget data and short-term time series data.

This contradiction between Kuznets empirical findings and Keynes' consumption function has been called consumption function puzzle. Efforts have been made by several economists to resolve this puzzle and new theories of consumption function have been put forward to resolve the conflict between Keynes's consumption function and Kuznets's findings.

To compare the Keynes' and Kuznets's consumption functions, it will be useful to write them in algebraic form and graphically represent them.

Keynes's consumption function can be algebraically written as below:

$$C = a + bY$$

where a is a positive intercept term which is also called autonomous consumption as it does not vary with income. The constant a shows that even when income is zero, a certain consumption is present. This is possible when in any year a community can live either on its past savings or borrow from other communities. Keynes' consumption function is shown in Fig. 6.7.

Secondly, b in the consumption function represents marginal propensity to consume ($\Delta C/\Delta Y$). The above mentioned Keynes's consumption function ($C = a + bY$) shows that average propensity to consume (C/Y) falls as income increases. This can be known by comparing slopes of the rays OA an OB at income levels Y_1 and Y_2 respectively in Fig. 6.7.

Kuznets's Consumption Function:

On the other hand, Kuznets found that consumption function is of the following form:

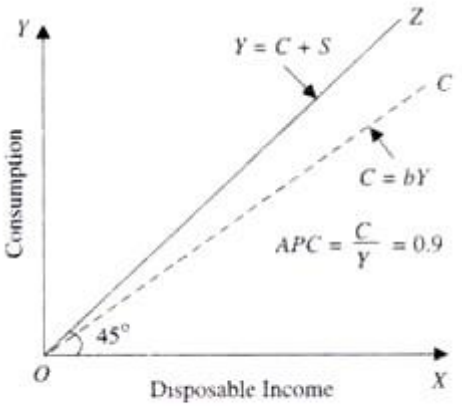


Fig. 6.8. *Kuznets's Consumption Function: Constant APC*

$$C = bY$$

In Kuznets' consumption function there is no intercept term (that is, autonomous consumption). This is shown in Fig. 6.8 where it will be seen that Kuznets consumption function curve starts from the origin and is very near to 45° line depicting that the propensity to consume (b) is very high. From his empirical study Kuznets estimated that average propensity to consume was nearly 0.9.

Besides, by dividing the entire period (1869-1933) into three over lapping 30 years sub-periods Kuznets found that the proportion of consumption to income (that is, average propensity to consume) was nearly the same and equal to about 0.87 in all the three sub-periods.

Thus Kuznets concluded that there was no tendency for the average propensity to consume to decline as disposable income rises. Thus, rounding off Kuznets estimated propensity to consume is equal to 0.9. His consumption function presented in equation (2) can be rewritten as

$$C = 0.9\ Y$$

From the above discussion it follows that implication of Keynes's consumption function ($C = a + bY$) and Kuznets consumption function ($C = bY$) are different. Whereas in Keynes' consumption function APC falls as income rises, in Kuznets's function it remains constant over a long period. Further, the value of marginal propensity to consume which is less than one is much higher in Kuznets's function as compared to that of Keynes.

The reconciliation between two types of consumption functions has been made by some economists by pointing out that whereas Keynes's function is short-run consumption function Keznets's function is concerned with long run and is referred to as long-run consumption function. In the long run, short run consumption function curve shifts above and therefore in the long run consumption function, propensity to consume is higher as compared to that in the short run.

Further, Friedman's permanent Income Hypothesis and Modigliani's Life Cycle Hypothesis have also tried to reconcile the two functions by referring to the short-run and long-run consumption behaviour of the people. We will discuss these consumption hypotheses in the appendix.

Importance of Consumption Function:

The concept of consumption function is greatly important both in theory and actual practice. To remove unemployment and to control economic fluctuations in the economy, it is very essential to adopt a proper macroeconomic policy. In the formation of such a policy, understanding of the concept of propensity of consume is very essential. Therefore, Prof. A.H. Hansen has remarked that "consumption function is epoch-making contribution of Keynes to economic theory".

We shall explain below some of the theoretical and practical importance of this consumption function:

(1) The concept of consumption function helps us to invalidate Say's law of classical economics. In fact, Keynes relied on his consumption function for proving the invalidity of Say's law. According to Say's law, every supply creates its own demand and therefore there is no problem of deficiency of aggregate demand. Therefore, general overproduction and unemployment in the economy is not possible because adequate amount of aggregate demand is ever present. Now, according to the Keynesian consumption function, when income increases consumption increases less than the increase in income and therefore saving gap emerges between income and consumption.

This saving gap implies that all output produced may not be sold and the problem of deficiency of demand will arise unless this saving gap is matched by an equal amount of investment demand. There is no guarantee that the saving done will be automatically invested or, in other words, it is not necessary that investment demand will be equal to the saving gap. Thus, the contention of the Say's law that every supply creates its equal demand is not valid. No doubt, every supply or production creates income equal to the output produced.

But since all income is not consumed and there is no guarantee that investment will be equal to the saving so emerged, Say's law is proved invalid. When investment is less than the saving gap corresponding to full-employment level of income, the aggregate demand is not sufficient to provide full-employment to the people and other resources. Thus, the problem of deficiency of effective demand and hence general unemployment and overproduction arises in a free enterprise capitalist economy.

(2) The concept of propensity to consume is also important because it brings out crucial significance of investment demand for determination of the level of income and employment in a capitalist economy. From the concept of propensity to consume we know that consumption increases less than the increase in income and as a result gap emerges between income and consumption.

To maintain a certain given level of income and employment, gap between income and consumption at that level must be bridged by investment expenditure otherwise it will not be possible to maintain that level of income and employment because aggregate demand would not be large enough.

This indicates the crucial importance of the investment demand in the determination of income and employment. To prevent the establishment of underemployment equilibrium in the economy or, in other words, for achieving full-employment equilibrium, investment demand must be equal to the saving gap at the level of full-employment. Keynes also showed that consumption function remains stable in the short run and therefore economic fluctuations in a capitalist economy are largely due to the fluctuations in investment demand.

Thus from the concept of propensity to consume it follows that investment demand is vitally important in determining the level of income and employment. If it were possible to raise the propensity to consume in the short run, then without raising investment, we could have raised the level of income and employment. Since propensity to consume at a given level of income generally remains stable, we have to increase investment for achieving full employment in the economy.

(3) Another crucial importance of the concept of propensity to consume is that we derive the theory of multiplier from it which has great practical importance in the formulation of macro-economic policy, especially of public works in times of depression.The magnitude of multiplier is equal to the reciprocal of one minus marginal propensity to consume (K = 1/1-MPC) where K stands for multiplier and MPC for marginal propensity to consume. According to this concept of multiplier, when investment increases, income, output and employment increase by a multiple amount, depending upon the size of the multiplier.

Income increases manifold than the original investment because of the nature of consumption function. When some investment in some projects is undertaken, it leads to the increase in income of those employed in the projects but the process does not stop here.

The increases in income are further spent on consumption and this leads to further increase in income and so the chain of increases in income and consumption continues and the ultimate increase in income and employment is multiple of the original increment in investment.

If the marginal propensity to consume were equal to zero, then all increments in income brought about by additional investment would have been saved and therefore multiplier process would not have worked. Since the marginal propensity to consume is greater than zero, the increase in net investment has a multiplier effect on income, output and employment. Thus, the effect of investment on income depends on the size of the multiplier which depends on the value of the marginal propensity to consume. The greater the marginal propensity to consume, the greater the size of the multiplier.

(4) From the concept of consumption function, we can also explain why there is a tendency for the marginal efficiency of capital to decline. The declining tendency of the marginal

efficiency of capital is due to the nature of the consumption function. Two features of consumption function are important. First, the marginal propensity to consume is less than one which implies that as income increases, consumption increases less than this. Secondly, consumption function is stable in the short run i.e., it does not shift much in the short run.

As we know that the level of investment is a crucial factor in the determination of income and employment, fluctuations in the levels of income and employment depend primarily on the fluctuations in investment. The investment demand in the short run is determined by the rate of interest on the one hand and marginal efficiency of capital on the other. Since the rate of interest is relatively sticky, it is the marginal efficiency of capital which greatly affects the level of investment in the short run.

Marginal efficiency of capital is nothing but the expected rate of profit on investment in the future. Thus, the marginal efficiency of capital is determined by the expectations of the entrepreneurs regarding the earning of profits from capital assets in the future.

Now, the most, important fact that affects the entrepreneurs expectations regarding profit prospects and thereby the marginal efficiency of capital is the level of future consumption demand for goods and services. Their estimate of future consumption demand depends on, among others, on the population growth. If population growth of a country is expected to fall as was estimated in the early thirties when Keynes wrote his book (General Theory of Employment, Interest and Money), this would adversely affect future consumption demand which in turn would adversely affect investment in the long run, Besides, according to Keynes, average propensity to consume (APC) falls as income of a community increases overtime.

This also adversely affects inducement to invest. If there does not occur capital-using technological change, this will result in decline in investment opportunities in the long run, causing secular stagnation. Thus we see that in the Keynesian scheme of things level of investment depends upon the level of consumption demand in the long run.

Since marginal propensity to consume is less than one and also the consumption function is stable when income increases, consumption does not increase proportionately. As a result, the aggregate demand becomes deficient and the marginal efficiency of capital declines. The decline

in the marginal efficiency of capital adversely affects investment which stops rising. As a result, the growth process stops and economic recession occurs.

In this way, Keynes himself and later important Keynesian economist, Prof. A.H. Hansen developed the theory of secular stagnation for the mature capitalist economies. This secular stagnation theory is based upon the assertion that investment opportunities in a capitalist economy will be exhausted soon due to the absence of the possibilities of increasing consumption demand. The meagre possibilities of increasing investment in the mature capitalist economies, according to them, were partly due to the constancy of consumption function and declining average propensity to consume which caused the marginal efficiency of capital to decline.

Theory of secular stagnation has not been found true by empirical evidence in the last over seventy years of growth in the capitalist developed countries. However, the fact that current consumption is influenced by changes in rate of interest, stock of wealth and price level and further that it is the changes current consumption level that determine short-run business expectations about future yields from investment which cause fluctuations in investment.

Together with the working of multiplier fluctuations in investment cause business cycles in a free market economy. This shows the great importance of Keynes's consumption function and the factors that determine it.

(5) As has been explained above, Keynesian concept of propensity to consume also helps us in explaining the turning points of a business cycle. The economy swings down from the peak it reaches because with marginal propensity to consume being less than one and average propensity to consume falling consumption demand does not increase as much as the increase in income and output. Over time this causes deficiency in aggregate demand which adversely affects investment demand by private business men.

Likewise, economy's downward movement stops and it starts recovery because marginal propensity to consume being less than one, people do not reduce their consumption as much as the reduction in their income. Even during depression people try to maintain their previous level of consumption. This ultimately induces investment for replacement of capital goods which wear

out over a period of business cycle. With the working of Keynesian investment multiplier recovery from recession gathers momentum.

UNIT V

Investment Function

The investment function refers to investment -interest rate relationship. There is a functional and inverse relationship between rate of interest and investment. The investment function slopes downward.

I = f (r)

I= Investment (Dependent variable)

r = Rate of interest (Independent variable)

1. Meaning of investment

The term investment means purchase of stocks and shares, debentures, government bonds and equities. According to Keynes, it is only financial investment and not real investment. This type of investment does result in an addition to the stock of real capital of the nation.

In the views of **Keynes**, Investment includes expenditure on capital investment.

2. Types of investment

Autonomous Investment and Induced Investment

Autonomous Investment

- Investment that is not dependent on the national income
- Mainly done with the welfare motive and not for making profits
- Examples : Construction of road, bridges, School, Charitable houses
- Not affected by rise in raw materials or wages of workers
- ssential to development of nation and out of depression

i) Autonomous investment:

Autonomous investment is the expenditure on capital formation, which is independent of the change in income, rate of interest or rate of profit.

This investment is independent of economic activity. Autonomous investment is income-inelastic, the volume of autonomous investment is the same at all levels.

The autonomous investment curve is horizontal, parallel to X axis.

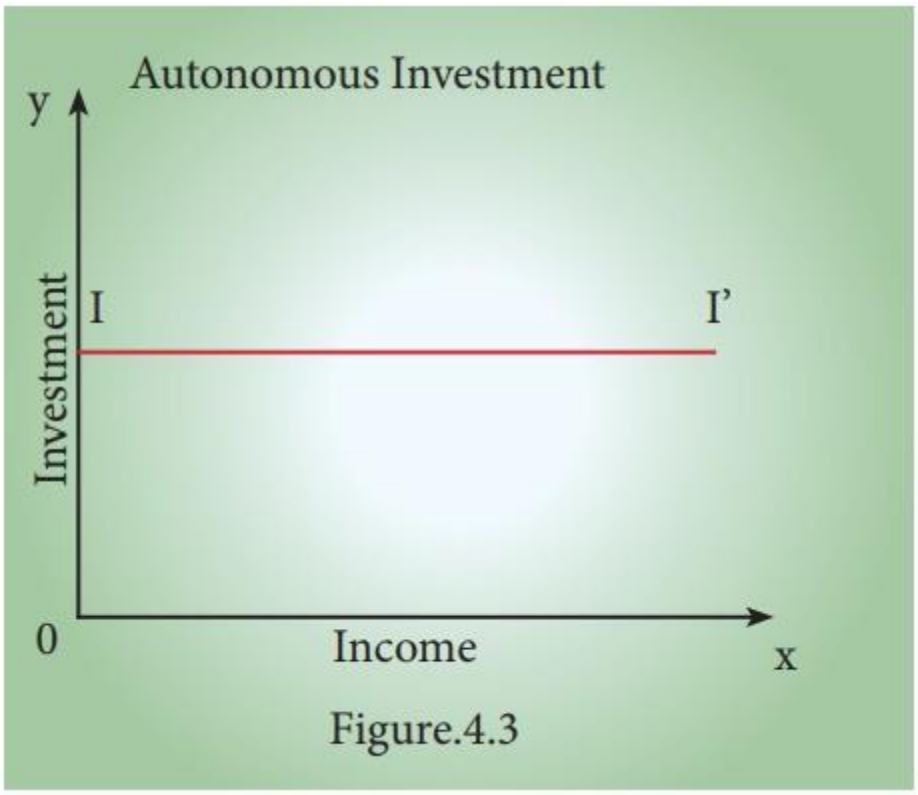


Figure.4.3

In the times of economic depression, the governments try to boost the autonomous investment. Thus, autonomous investment is one of the key concepts in welfare economics.

Generally, Government makes autonomous investment because of the welfare consideration.

ii) Induced investment:

Induced investment is the expenditure on fixed assets and stocks which are required when level of income and demand in an economy goes up.

Induced investment is profit motivated. It is related to the changes of national income. The relationship between the national income and induced investment is positive; decreases in national income leads to decrease in induced investment and vice versa. Induced investment is income elastic. It is positively sloped as shown here.

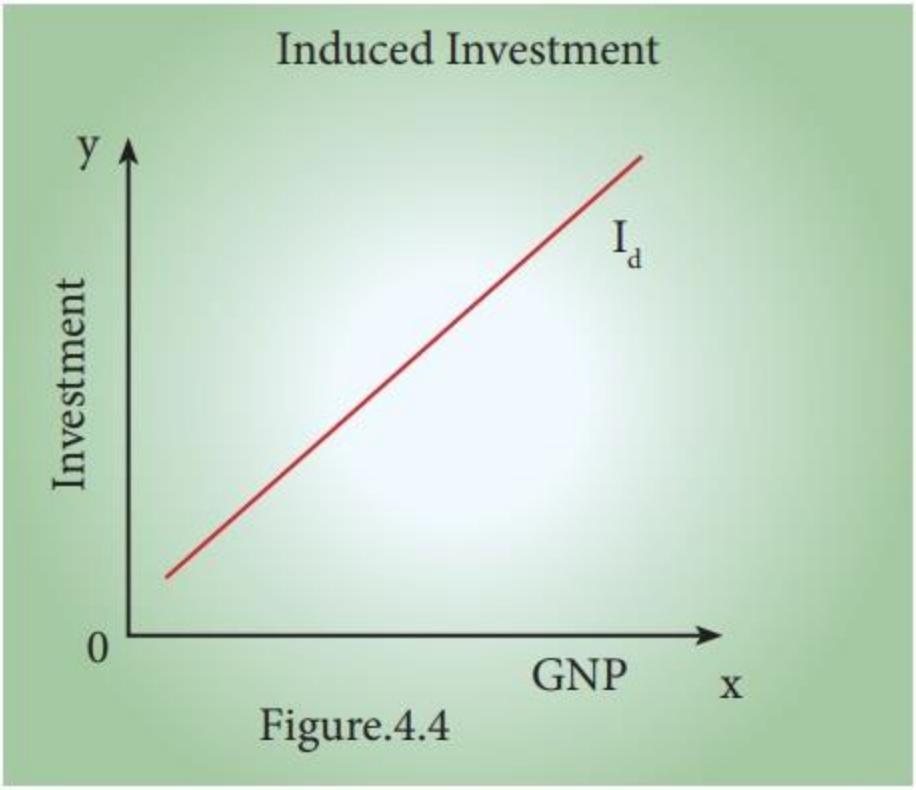


Figure.4.4

Sl. No	Autonomous Investment	Induced Investment
1	Independent	Planned
2	Income inelastic	Income elastic
3	Welfare motive	Profit Motive

3. Determinants of Investment Function

The classical economists believed that investment depended exclusively on rate of interest. In reality investment decision depends on a number of factors. They are as follows:

1. Rate of interest

2. Level of uncertainty

3. Political environment

4. Rate of growth of population

5. Stock of capital goods

6. Necessity of new products

7. Level of income of investors

8. Inventions and innovations

9. Consumer demand

10. Policy of the state

11. Availability of capital

12. Liquid assets of the investors

However, **Keynes** contended that business expectations and profits are more important in deciding investment. He also pointed out that investment depends on MEC (Marginal Efficiency of Capital) and rate of interest.

i. Private investment is an increase in the capital stock such as buying a factory or machine.

The marginal efficiency of capital (MEC) states the rate of return on an investment project. Specifically, it refers to the annual percentage yield (output) earned by the last additional unit of capital.

ii. If the marginal efficiency of capital is 5% and interest rates is 4%, then it is worth borrowing at 4% to get an expected increase in output of 5%.

4. Relationship between rate of interest and Investment:

An explanation of how the rate of interest influences the level of investment in the economy. Typically, higher interest rates reduce investment, because higher rates increase the cost of borrowing and require investment to have a higher rate of return to be profitable.

Interest rates and investment

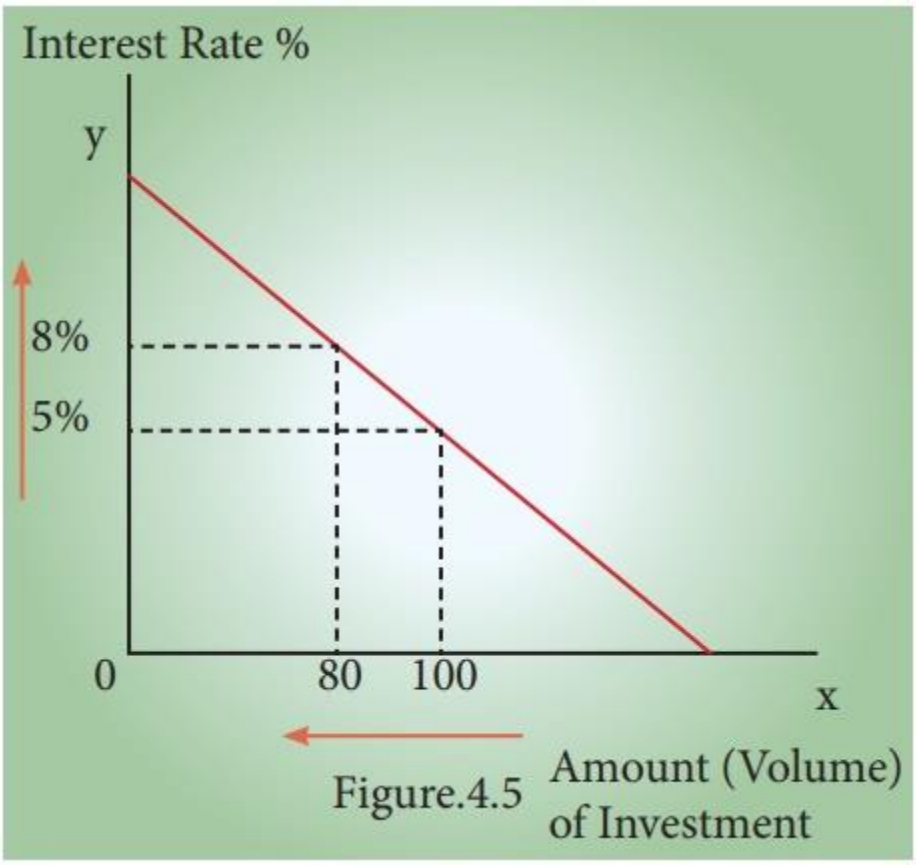


Figure.4.5

As the real cost of borrowing rises, fewer investment projects are profitable.

If interest rates rise from 5% to 8 %, then we get a fall in the amount of investment from ₹ 100 cr to ₹ 80 cr.

If interest rates are increased then it will tend to discourage investment because investment has a higher opportunity cost.

1. With higher rates, it is more expensive to borrow money from a bank.

2. Saving money in a bank gives a higher rate of return. Therefore, using savings to finance investment has an opportunity cost of lower interest payments.

If interest rates rise, firms will need to gain a better rate of return to justify the cost of borrowing using savings.

5. Marginal Efficiency of Capital.

MEC was first introduced by J.M Keynes in 1936 as an important determinant of autonomous investment. The MEC is the expected profitability of an additional capital asset. It may be defined as the highest rate of return over cost expected from the additional unit of capital asset.

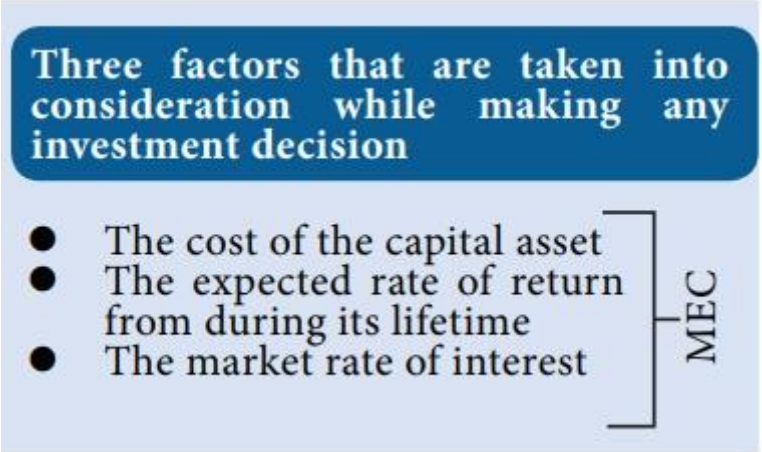
Meaning of Marginal Efficiency of Capital (MEC) is the rate of discount which makes the discounted present value of expected income stream equal to the cost of capital.

MEC depends on two factors:

1. The prospective yield from a capital asset.

2. The supply price of a capital asset.

Factors Affecting MEC:



The marginal efficiency of capital is influenced by short - run as well as long-run factors. These factors are discussed in brief:

a) Short - Run Factors

(i) Demand for the product:

If the market for a particular good is expected to grow and its costs are likely to fall, the rate of return from investment will be high. If entrepreneurs expect a fall in demand for goods and a rise in cost, the investment will decline.

(ii) Liquid assets:

If the entrepreneurs are holding large volume of working capital, they can take advantage of the investment opportunities that come in their way. The MEC will be high.

(iii) Sudden changes in income:

The MEC is also influenced by sudden changes in income of the entrepreneurs. If the business community gets windfall profits, or tax concession the MEC will be high and hence investment in the country will go up. On the other hand, MEC falls with the decrease in income.

(iv) Current rate of investment:

Another factor which influences MEC is the current rate of investment in a particular industry. If in a particular industry, much investment has already taken place and the rate of investment currently going on in that industry is also very large, then the marginal efficiency of capital will be low.

(v) Waves of optimism and pessimism:

The marginal efficiency of capital is also affected by waves of optimism and pessimism in the business cycle. If businessmen are optimistic about future, the MEC will be likely to be high. During periods of pessimism the MEC is under estimated and so will be low.

b) Long - Run Factors

The long run factors which influence the marginal efficiency of capital are as follows:

(i) Rate of growth of population:

Marginal efficiency of capital is also influenced by the rate of growth of population. If population is growing at a rapid speed, it is usually believed that the demand of various types of goods will increase. So a rapid rise in the growth of population will increase the marginal efficiency of capital and a slowing down in its rate of growth will discourage investment and thus reduce marginal efficiency of capital.

(ii) Technological progress:

If investment and technological development take place in the industry, the prospects of increase in the net yield brightens up. For example, the development of automobiles in the 20th century has greatly stimulated the rubber industry, the steel and oil industry etc. So we can say that inventions and technological improvements encourage investment in various projects and increase marginal efficiency of capital.

(iii) Monetary and Fiscal policies:

Cheap money policy and liberal tax policy pave the way for greater profit margin and so MEC is likely to be high.

(iv) Political environment:

Political stability, smooth administration, maintenance of law and order help to improve MEC.

(v) Resource availability:

Cheap and abundant supply of natural resources, efficient labour and stock of capital enhance the MEC.

6. Marginal Efficiency of Investment

MEI is the expected rate of return on investment as additional units of investment are made under specified conditions and over a period of time. When cost of borrowing is high, businesses are less motivated to borrow money and make investment on different projects because high cost of borrowing reduces profit margin of the business firms;

Marginal Efficiency of Capital(MEC)	Marginal Efficiency of Investment(MEI)
1) It is based on a given supply price for capital.	1) It is based on the induced change in the price due to change in the demand for capital.
2) It represents the rate of return on all successive units of capital without regard to existing capital.	2) It shows the rate of return on just those units of capital over and above the existing capital stock.
3) The capital stock is taken on the X axis of diagram.	3) The amount of investment is taken on the X - axis of diagram.
4) It is a "stock" concept.	4) It is a "flow" concept.
5) It determines the optimum capital stock in an economy at each level of interest rate.	5) It determines the net investment of the economy at each interest rate given the capital stock.

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The Investment Function: Meaning, Types, Determinants and Distinction

In ordinary parlance, investment means to buy shares, stocks, bonds and securities which already exist in stock market. But this is not real investment because it is simply a transfer of existing assets.

Contents

I. Induced Investment

II. Autonomous Investment

3. Determinants of the Level of Investment

4. The Marginal Efficiency of Investment (MEI)

5. Distinction between MEC and MEI

1. Meaning of Capital and Investment:

In ordinary parlance, investment means to buy shares, stocks, bonds and securities which already exist in stock market. But this is not real investment because it is simply a transfer of existing assets. Hence this is called financial investment which does not affect aggregate spending. In Keynesian terminology, investment refers to real investment which adds to capital equipment.

It leads to increase in the levels of income and production by increasing the production and purchase of capital goods. Investment thus includes new plant and equipment, construction of public works like dams, roads, buildings, etc., net foreign investment, inventories and stocks and shares of new companies. In the words of Joan Robinson, "By investment is meant an addition to capital, such as occurs when a new house is built or a new factory is built. Investment means making an addition to the stock of goods in existence."

Capital, on the other hand, refers to real assets like factories, plants, equipment, and inventories of finished and semi-finished goods. It is any previously produced input that can be used in the production process to produce other goods. The amount of capital available in an economy is the stock of capital. Thus capital is a stock concept.

To be more precise, investment is the production or acquisition of real capital assets during any period of time. To illustrate, suppose the capital assets of a firm on 31 March 2004 are Rs 100 crores and it invests at the rate of Rs 10 crores during the year 2004-05. At the end of the next year (31 March 2005), its total capital will be Rs 110 crores. Symbolically, let I be investment and K be capital in year t, then $I_t = K_t - K_{t-1}$.

Capital and investment are related to each other through net investment. Gross investment is the total amount spent on new capital assets in a year. But some capital stock wears out every year and is used up for depreciation and obsolescence. Net investment is gross investment minus depreciation and obsolescence charges for replacement investment. This is the net addition to the existing capital stock of the economy.

If gross investment equals depreciation, net investment is zero and there is no addition to the economy's capital stock. If gross investment is less than depreciation, there is disinvestment in the economy and the capital stock decreases. Thus for an increase in the real capital stock of the economy, gross investment must exceed depreciation, i.e., there should be net investment.

2. Types of Investment:

I. Induced Investment:

Real investment may be induced. Induced investment is profit or income motivated. Factors like prices, wages and interest changes which affect profits influence induced investment. Similarly demand also influences it. When income increases, consumption demand also increases and to meet this, investment increases. In the ultimate analysis, induced investment is a function of income i.e., I = f(Y). It is income elastic. It increases or decreases with the rise or fall in income, as shown in Figure 1.

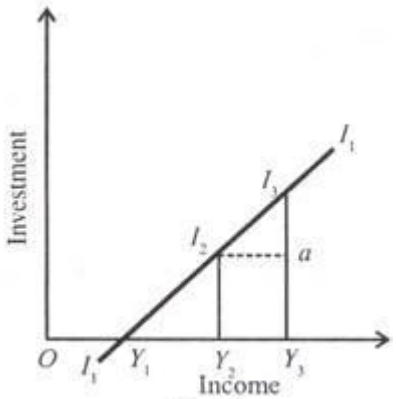

Fig. 1

I_1 $I_1$is the investment curve which shows induced investment at various levels of income. Induced investment is zero at OY_1 income. When income rises to OY_3 induced investment is I_3Y_y A fall in income to OY_2 also reduces induced investment to I_2Y_2.

Induced investment may be further divided into

(i) the average propensity to invest, and

(ii) the marginal propensity to invest:

(i) The average propensity to invest is the ratio of investment to income, I/Y. If the income is Rs. 40 crores and investment is Rs. 4 crores, I/Y = 4/40 = 0.1. In terms of the above figure, the average propensity to invest at OY_3 income level is I_3Y_3/ OY_3

(ii) The marginal propensity to invest is the ratio of change in investment to the change in income, i.e., $\Delta I/\Delta Y$. If the change in investment, ΔI=Rs 2 crores and the change in income, ΔY = Rs 10 crores, then $\Delta I/\Delta Y = 2/10=0.2$ In Figure 1, $\Delta I/\Delta Y = I_3a/Y_2Y_3$

2. Autonomous Investment:

Autonomous investment is independent of the level of income and is thus income inelastic. It is influenced by exogenous factors like innovations, inventions, growth of population and labour force, researches, social and legal institutions, weather changes, war, revolution, etc. But it is not influenced by changes in demand. Rather, it influences the demand. Investment in economic and social overheads whether made by the government or the private enterprise is autonomous.

Such investment includes expenditure on building, dams, roads, canals, schools, hospitals, etc. Since investment on these projects is generally associated with public policy, autonomous investment is regarded as public investment. In the long-run, private investment of all types may be autonomous because it is influenced by exogenous factors. Diagrammatically, autonomous investment is shown as a curve parallel to the horizontal axis as I_1I' curve in Figure 2. It indicates that at all levels of income, the amount of investment OI_1 remains constant.

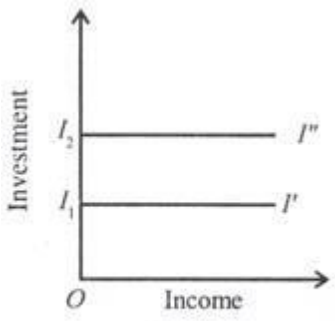

Fig. 2

The upward shift of the curve to I_2I'' indicates an increased steady flow of investment at a constant rate OI_2 at various levels of income. However, for purposes of income determination, the autonomous investment curve is superimposed on the C curve in a 45° line diagram.

3. Determinants of the Level of Investment:

The decision to invest in a new capital asset depends on whether the expected rate of return on the new investment is equal to or greater or less than the rate of interest to be paid on the funds needed to purchase this asset. It is only when the expected rate of return is higher than the interest rate that investment will be made in acquiring new capital assets.

In reality, there are three factors that are taken into consideration while making any investment decision. They are the cost of the capital asset, the expected rate of return from it during its lifetime, and the market rate of interest. Keynes sums up these factors in his concept of the marginal efficiency of capital (MEC).

Marginal Efficiency of Capital:

The marginal efficiency of capital is the highest rate of return expected from an additional unit of a capital asset over its cost. In the words of Kurihara, "It is the ratio between the prospective yield to additional capital goods and their supply price." The prospective yield is the aggregate net return from an asset during its life time, while the supply price is the cost of producing this asset.

If the supply price of a capital asset is Rs. 20,000 and its annual yield is Rs. 2,000, the marginal efficiency of this asset is 2000/20000 × 100/1 = 10 per cent. Thus the marginal

efficiency of capital is the percentage of profit expected from a given investment on a capital asset.

Keynes relates the prospective yield of a capital asset to its supply price and defines the MEC as "equal to the rate of discount which would make the present value of the series of annuities given by the returns expected from the capital assets during its life just equal to its supply price."

Symbolically, this can be expressed as:

$$S_P = R_1/(1+i) + R_2(1+i)^2 + R_n/(1+i)_n$$

Where Sp is the supply price or the cost of the capital asset, R_1 R_2… and R_n are the prospective yields or the series of expected annual returns from the capital asset in the years, 1, 2… and n, *i* is the rate of discount which makes the capital asset exactly equal to the present value of the expected yield from it.

This *i* is the MEC or the rate of discount which equates the two sides of the equation. If the supply price of a new capital asset is Rs 1,000 and its life is two years, it is expected to yield Rs 550 in the first year and Rs 605 in the second year. Its MEC is 10 per cent which equates the supply price to the expected yields of this capital asset.

Thus

$$(Sp)\ Rs\ 1000 = 550/(1.10) + (605)/(1.10)^2 = Rs.\ 500 + 500$$

In equation (1), the term $R_1/(1+i)$ is the present value (PV) of the capital asset. The present value is "the value of payments to be received in the future." It depends on the rate of interest at which it is discounted.

Suppose we expect to receive Rs 100 from a machine in a year's time and the rate of interest is 5 per cent. The present value of this machine is

$$R_1/(1+i) = 100/(1.05) = Rs\ 95.24$$

If we expect Rs 100 from the machine after two years then its present value is $100/(1.05)^2$ = Rs 90.70. The present value of a capital asset is inversely related to the rate of interest. The lower the rate of interest, the higher is the present value, and vice versa. For instance, if the

rate of interest is 5 per cent, PV of an asset of Rs 100 for one year will be Rs 95.24; at 7 per cent interest rate, it will be Rs 93.45; and at 10 per cent interest rate, it will be Rs 90.91.

The relation between the present value and the rate of interest is shown in Figure 3, where the rate of interest is taken on the horizontal axis while the present value of the project on the vertical axis. The curve PR shows the inverse relation between the present value and the rate of interest. If the current rate of interest is i_i the present value of the project is P_1 On the other hand, a higher rate of interest (i_2) will lead to a lower present value (P_2) when the present value curve (PR) cuts the horizontal axis at point (Z), the net present value becomes zero.

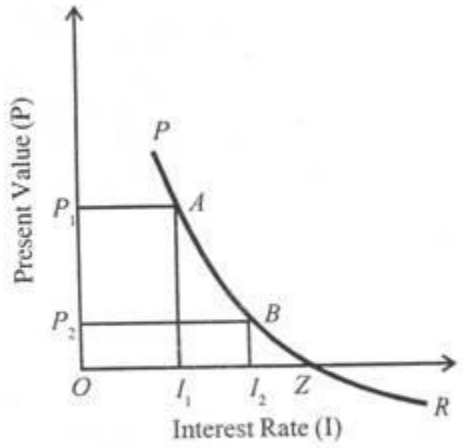

Fig. 3

As a matter of fact, the MEC is the expected rate of return over cost of a new capital asset. In order to find out whether it is worthwhile to purchase a capital asset it is essential to compare the present value of the capital asset with its cost or supply price. If the present value of a capital asset exceeds its cost of buying, it pays to buy it. On the contrary, if its present value is less than its cost, it is not worthwhile investing in this capital asset.

The same results can be had by comparing the MEC with the market rate of interest. If the MEL of a capital asset is higher than the market rate of interest at which it is borrowed, it pays to purchase the capital asset, and vice versa. If the market interest rate equals the MEC of the capital asset, the firm is said to possess the optimum capital stock.

If the MEC is higher than the rate of interest, there will be a tendency to borrow funds in order to invest in new capital assets. If the MEC is lower than the rate of interest, no firm will

borrow to invest in capital assets. Thus the equilibrium condition for a firm to hold the optimum capital stock is where the MEC equals the interest rate.

Any disequilibrium between the MEC and the rate of interest can be removed by changing the capital stock, and hence the MEC or by changing the rate of interest or both. Since the stock of capital changes slowly, therefore, changes in the rate of interest are more important for bringing equilibrium. The above arguments which have been applied to a firm are equally applicable to the economy.

Figure 4 shows the MEC curve of an economy. It has a negative slope (from left to right downward) which indicates that the higher the MEC, the smaller the capital stock. Or, as the capital stock increases, the MEC falls. This is because of the operation of the law of diminishing returns in production.

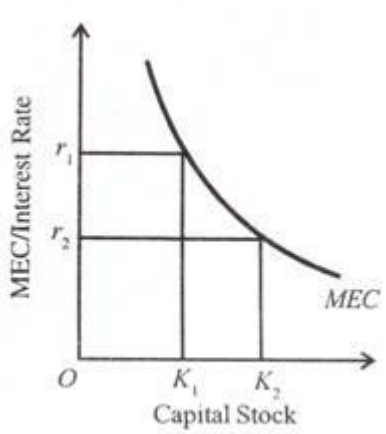

Fig. 4

As a result, the marginal physical productivity of capital and the marginal revenue fall. In the figure, when the capital stock is OK_1, the MEC is Or_1. As the capital increases from $OK_1$to OK_2 the MEC falls from Or_1 to Or_2 .The net addition to the capital stock K_1K_2 represents the net investment in the economy.

Further, to reach the optimum (desired) capital stock in the economy, the MEC must equal the rate of interest. If, as shown in the figure, the existing capital stock is OK_1 the MEC is Or_2 and the rate of interest is at Or_1 Everyone in the economy will borrow funds and invest in capital assets.

This is because MEC (Or_1) is higher than the rate of interest (at Or_2). This will continue till the MEC (Or_1) comes down to the level of the interest rate (at Or_2). When the MEC equals the rate of interest, the economy reaches the level of optimum capital stock. The fall in the MEC is due to the increase in the actual capital stock from OK_2 to the optimum (desired) capital stock OK_2.

The increase in the firm's capital stock by K_1K_2 is the net investment of the firm. But it is the rate of interest which determines the size of the optimum capital stock in the economy. And it is the MEC which relates the amount of desired capital stock to the rate of interest. Thus the negative slope of the MEC curve indicates that as the rate of interest falls the optimum stock of capital increases.

4. The Marginal Efficiency of Investment (MEI):

The marginal efficiency of investment is the rate of return expected from a given investment on a capital asset after covering all its costs, except the rate of interest. Like the MEC, it is the rate which equates the supply price of a capital asset to its prospective yield. The investment on an asset will be made depending upon the interest rate involved in getting funds from the market. If the rate of interest is high, investment is at a low level.

A low rate of interest leads to an increase in investment. Thus the MEI relates the investment to the rate of interest. The MEI schedule shows the amount of investment demanded at various rates of interest. That is why, it is also called the investment demand schedule or curve which has a negative slope, as shown in Fig. 5(A). At Or_1 rate of interest, investment is OF. As the rate of interest falls to Or_2, investment increases to OI".

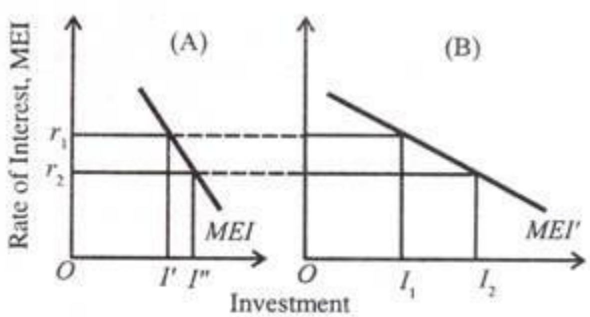

Fig. 5

To what extent the fall in the interest rate will increase investment depends upon the elasticity of the investment demand curve or the MEI curve. The less elastic is the MEI curve, the lower is the increase in investment as a result of fall in the rate of interest, and vice versa.

In Figure 5 the vertical axis measures the interest rate and the MEI and the horizontal axis measures the amount of investment. The MEI and MEI' are the investment demand curves. The MEI curve in Panel (A) is less elastic to investment which increases by I'I''. This is less than the increase in investment $I_1I''_2$ shown in Panel (B) where the MEI' curve is elastic. Thus given the shape and position of the MEI curve, a fall in the interest rate will increase the volume of investment.

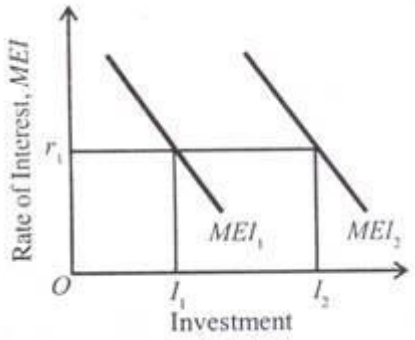

Fig. 6

On the other hand, given the rate of interest, the higher the MEI, the larger shall be the volume of investment. The higher marginal efficiency of investment implies that the MEI curve shifts to the right. When the existing capital assets wear out, they are replaced by new ones and level of investment increases.

But the amount of induced investment depends on the existing level of total purchasing. So more induced investment occurs when the total purchasing is higher. The higher total purchasing tends to shift the MEI to the right indicating that more inducement to investment takes place at a given level of interest rate.

This is explained in Figure 6, where MEI_1 and MEI_2 curves indicate two different levels of total purchasing in the economy. Let us suppose that the MEI, curve indicates that at Rs 200 crores of total purchasing, OI_1 (Rs 20 crores) investment occurs at Or_1 interest rate. If total purchasing rises to Rs 500 crores, the MEI_1 curve shifts to the right as MEI_2 and the level of induced investment increases to OI_2 (Rs 50 crores) at the same interest rate Or_1.

5. Distinction between MEC and MEI:

Keynes did not distinguish between the marginal efficiency of capital (MEC) and the marginal efficiency of investment (MEI).

But modern economists have made clear distinctions between the two concepts as follows:

(i) The MEC is based on a given supply price for capital, and the MEI on induced changes in this price.

(ii) The MEC shows the rate of return on all successive units of capital without regard to the existing stock of capital. On the other hand, the MEI shows the rate of return on only units of capital over and above the existing stock of capital.

(iii) In the MEC, the capital stock is taken on the horizontal axis of a diagram, while in the MEI the amount of investment is taken horizontally on the X-axis.

iv) The MEC is a ‘stock’ concept, and the MEI is a ‘flow’ concept.

(v) The MEC determines the optimum capital stock in an economy at each level of interest rate. The MEI determines the net investment of the economy at each interest rate, given the capital stock.