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UNIT 1



BASIC CONCEPTS IN MACROECONOMICS

Stocks and Flows

When studying economics, it is important to determine whether the variable being studied is a stock variable or a flow variable. A stock variable is measured at a specific point in time while a flow variable is measured over a specified period of time.

A stock signifies the level of a variable at point in time. For example, the total number of people employed in India is a stock variable. A flow represents the change in the level of a variable over a period of time. For example the number of person who get new jobs during a year is a flow variable. The balance sheet of a company is a stock statement (balance sheet as on 31 March 2002), whereas the profit and loss account is a flow statement (income statement for the year 2001-2002). Macroeconomics variables such as money supply, consumer price index, unemployment level and foreign exchange reserves are examples of stock variables. GDP, inflation, exports, imports, consumption and investment are examples of flow variables.

Equilibrium and Disequilibrium

In economics as in the physical sciences, equilibrium is a state of balance between opposing forces or actions and disequilibrium is the absence of equilibrium. Economic equilibrium does not mean a motionless state where no action takes place rather it is a state where the action is repetitive in nature. Even though the forces acting on the system may be in a continuous state of change, the state of equilibrium is maintained as long as the net effect of these changing forces does not disturb the established position of equilibrium.

Static and Dynamics

Economic models deal with stock and flow variables. These variables can either be in equilibrium or disequilibrium at a particular point of time. If the variables are in equilibrium and tend to repeat themselves from one time period to another, they are said to be in a state of 'stationary equilibrium'. If the variables are in a state of disequilibrium, in all likelihood, they will have different values in the next time period.

Models which do not consider explicitly the behavior of variables from one time period to another are called 'static' models. In static models, variables do not leave a time dimensions. As these models do not consider the passage of time, they cannot explain the process of change. Static models indicate the values of variables for a given time period, but cannot indicate what their values will be in the next period. At the most, they can only indicate the direction of change. In contrast dynamic models explicitly consider the movement of variables over different time periods. What happens in one time period is related to what happened in the preceding time periods and what is expected to happen in the succeeding periods. In other words, variables in dynamic models are said to be 'dated'. These models describe the movement of variables from one disequilibrium position to another, until equilibrium is ultimately reached.

CHAPTER 1

Introduction to Macroeconomics

CHAPTER OBJECTIVES

The objective of this chapter is to introduce macroeconomics and to discuss analytical framework along the following aspects:

- Introduction of macroeconomics as a branch of economics
- A brief account of macroeconomic variables
- Macroeconomics as theoretical and policy science
- Comparison of macroeconomics with microeconomics
- Taking a view of origin and growth of macroeconomics
- The basic concepts and approaches to macroeconomic analysis
- A brief description of model building in macroeconomics
- Importance and limitations of macroeconomics

INTRODUCTION

As is widely known, modern economics has two major branches: (i) **microeconomics** and (ii) **macroeconomics**¹. Although economics as a social science was founded by Adam Smith, the ‘Father of Economics’², in his book *The Wealth of Nations* in 1776, the subject matter of economics remained confined until 1930s to what is now known as *microeconomics*. The economic thoughts and theories propounded by the classical

economists from the days of Adam Smith down to the neo-classical economists until the Great Depression (1929-1934) was confined to what is known as microeconomics. Therefore, until the early 1930s, the scope of economics remained limited to *microeconomics*. It was in 1936 that John Maynard Keynes laid the foundation of macroeconomics as a new branch of economics by writing his revolutionary book *The General Theory of Employment, Interest and Money* (1936). The subsequent growth of literature on the interpretation and elaboration of Keynesian thoughts and theories and the empirical verification and evaluation of his thoughts and theories over a period of three decades, culminated in the emergence of *macroeconomics*. The subject matter and the scope of macroeconomics continued to expand further with the counter-criticism of Keynesian theories and methodology and formulation of new macroeconomic theories, which led to the foundation of post-Keynesian macroeconomics. The prime objective of this book is to present a comprehensive and authentic elaboration of the Keynesian and post-Keynesian macroeconomics.

1.1 WHAT IS MACROECONOMICS

Macroeconomics is essentially the study of the performance and the behaviour of the economy as whole. It may be noted at the outset that defining economics has been a difficult proposition. So is the case with macroeconomics. Nevertheless, some economists have attempted to define macroeconomics according to their own perception of its subject matter. Let us take a view of some relatively comprehensive definitions of macroeconomics offered by some famous economists as it would give broad view of what macroeconomics is about.

Gardner Ackley: “Macroeconomics is the study of forces or factors that determine the levels of aggregate production, employment and prices in the economy, and their rate of change over time”³.

Kenneth E Boulding: “Macroeconomics is the study of the nature, relationships and behaviour of aggregates of economic quantities.... Macroeconomics ... deals not with individual quantities as such, but 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”⁴.

J. M. Culbertson: “Macroeconomic theory is the theory of income, employment, prices and money”⁵.

P. A. Samuelson and W. D. Nordhaus: “Macroeconomics is the study of the behaviour of the economy as a whole. It examines the overall level of a nation’s output, employment, and prices”⁶.

Although these definitions are fairly comprehensive, they do not reveal the exact nature and scope of modern macroeconomics, nor do they fully capture its subject matter. Since “macroeconomics is [still] a young and imperfect science” (Mankiw, *Macroeconomics*, 2003, p. 3), it is difficult to define it precisely. However, the definitions quoted above do give an idea of the central theme of theoretical macroeconomics, and this is what matters in economics. The central theme that emerges from the above definitions may be stated as follows: *Macroeconomics is essentially the study of the behaviour and performance of the economy as a whole. It examines the relationship and interaction between the ‘factors and forces’ that determine the level and growth of national output and employment, general price level, and the balance of payments of the economy.* This definition too should be treated only as a working definition of macroeconomics.

In order to comprehend the subject matter of macroeconomics, let us look at the basic questions that macroeconomics seeks to answer.

- What determines the levels of economic activities, total output, the general price level, and the overall employment in a country?
- How is the equilibrium level of national income determined?
- What causes fluctuations in the national output and employment?
- What determines the general level of prices in a country?
- What determines the level of foreign trade and trade balance?
- What causes disequilibrium in the balance of payments of a country?
- How do the monetary and fiscal policies of the government affect the economy?

- What kind of economic policies can restrain economic recession and steer the economy on the path of growth?

These are some major theoretical questions that macroeconomics seeks to answer.

1.2 MACROECONOMIC VARIABLES

As mentioned above, macroeconomics is the study of the behaviour of the economy as a whole. The behaviour of the economy as a whole is studied on the basis of the behaviour of the aggregate variables, i.e., **macroeconomic variables**. Macroeconomic variables are, in general, interrelated and interdependent. Macroeconomics provides the framework for analysing the nature and extent of relationship and interactions between the aggregate variables, which leads to the formulation of macroeconomic theories. It is, therefore, important to have a view of macroeconomic variables. For analytical purpose, macroeconomic variables can be classified under two categories: (i) Goods market macro variables, and (ii) Money market macro variables. The two kinds of macro variables are listed in Table 1.1.

Table 1.1 Macroeconomic Variables

Goods Market Macro Variables	Money Market Macro Variables
1. Gross Domestic Product (<i>GDP</i>)	1. Aggregate money supply
2. Aggregate consumption expenditure	2. Aggregate money demand
3. Aggregate savings	3. Transaction demand for money
4. Aggregate investment	4. Speculative demand for money
5. Total tax revenue	5. Interest rate
6. Total government expenditure	6. Exchange rate
7. Total exports	7. Balance of payments
8. Total imports	
9. Employment	

Among the macro variables of the *goods market*, gross domestic product (*GDP*) is the most important macro variable as all the other macro variables of the goods market, except employment, are the components of *GDP*. All the goods-market variables are *flow variables* in the sense that they are subject to change over time with change in their determinants. Also, all

goods-market macro variables are interrelated and interdependent. The interrelationship and interdependence of the macro variables will be discussed ahead along with the theory of income determination.

In case of macro variables of the *money market*, aggregate money supply and aggregate money demand are the two most important macro variables. The aggregate money supply is determined autonomously by the central bank of the country and, in the analysis of money market, it is treated to be a stock variable. But, money demand is treated as a flow variable. Money demand consists of transaction plus speculative demands for money. The variable 'interest rate' is determined by aggregate money supply and money demand.

Beside, the macro variables of the goods and money market are also interrelated and interdependent. Their interrelationship and interdependence are elaborately discussed and presented graphically and in functional form in Chapter 17. It may be noted here that the analysis of the interaction between macro variables of goods and money market makes a very important contribution to macroeconomics, known as *IS-LM* model. The interaction between the goods market and money market variables determines the level of the ultimate target variables: (i) economic growth, (ii) general price level, and (iii) balance of payments.

1.3 MACROECONOMICS AS A THEORETICAL AND A POLICY SCIENCE

As Samuelson and Nordhaus have pointed out, "...macroeconomics is still an area of great controversy among economists and politicians alike" (*op. cit.*, p. 381). While some economists consider macroeconomics basically as a theoretical science, some others consider it as a purely policy science. This kind of controversy on the nature of macroeconomics raises a question: Is macroeconomics a theoretical science or a policy science? Macroeconomics, however, has both *theoretical* and *policy* orientations. Let us now look at theoretical and policy orientations of macroeconomics.

of changing prices lead to some price rigidities' which cause fluctuations in output and employment²³.

Conclusion To conclude, it may be added that "Mankiw has rightly remarked that macroeconomics is [still] a young and imperfect science"²⁴. Nevertheless, macroeconomics theories and policies as developed by the economists so far have gained wide recognition and application. This fact has led to emergence of macroeconomics as a dominant branch of economic science.

1.6 SOME BASIC CONCEPTS AND APPROACHES TO MACROECONOMIC ANALYSIS

In the preceding section, we have narrated briefly the emergence and growth of macroeconomics as a branch of economics. The macroeconomists of different generations have adopted different concepts and have applied different approaches to analyse the macroeconomic phenomena. In this section, we outline some basic concepts used and approach adopted by the economists in general as it will be helpful in comprehending macroeconomic theories developed by the economists of different generations.

1.6.1 Concept of Stock and Flow Variables

Macroeconomic variables used in macroeconomic studies have been described in Section 1.2 of this chapter. In the theoretical analysis of a macroeconomic phenomenon, macro variables are generally classified under two categories: (i) *stock variables*, and (ii) *flow variables*. A brief description of *stock variables* and *flow variables* are given below:

(i) Stock Variables: Stock variables refer to the quantity or value of certain economic variables estimated at a point of time, depending on the period of financial accounting, e.g., at the end of the financial year – 31st March - or at the end of the calendar 31st December. In economic analysis, th

variables that are supposed or assumed to remain constant over the period of analytical framework are treated as *stock variables*. For example, the stock of capital of a country is deemed to remain constant during the financial year. So the stock of capital is treated as a stock variable. Similarly, the total annual money supply and labour employment are treated as stock variables.

(ii) Flow Variables: Flow variables are the macro variables that are expressed per unit of time, e.g., per hour, per day, per week or per year. For example, gross domestic product (*GDP*), aggregate consumption, savings, investment, exports and imports are treated as flow variables.

In order to understand the distinction between the stock and the flow variables, consider the following examples. The stock of food grains with Food Corporation of India (FCI) is taken as a stock variable but the supply of food grains per unit of time by FCI to the food grain dealers is treated as a flow variable. A fixed deposit with a bank is a stock variable and the interest earned on the deposit, e.g., the monthly or annual interest income, is a flow variable. The stock of capital in terms of plant, building, machinery stocks, etc., is a *stock variable* and the annual investment is a *flow variable*. The macroeconomic stock and flow variables are listed in Table 1.2.

Table 1.2 Macroeconomic Stock and Flow Variables

Stock Variables	Flow Variables
Stock of Capital (K)	Gross National Product (GNP)
Supply of Money (M)	Consumption Expenditure (C)
Business Inventories (BI)	Savings (S) and Investments (I)
Accumulated Savings (S)	Exports (X) and Imports (M)
Labour Force (L)	Change in Inventories (ΔK)
Total Employment (N)	Government Revenue (R)
Accumulated Wealth	Government Expenditure (G)

It is important to note that the classification of stock and flow variables, as given above, is a matter of analytical convenience and practice. Conceptually, it is difficult to make an all-purpose classification of macroeconomic variables between stock and flow. For, given the purpose of

analysis, a flow variable can be interpreted as a stock variable and vice versa. For example, national income is a flow variable, but it can be treated as a stock variable for the year of reference. Similarly, employment is a stock variable, from head-count point of view, but from the viewpoint of work effort in terms of man-hours, it can be treated as a flow variable.

Furthermore, macroeconomic variables are open to different interpretations. Therefore, it is difficult to make a clear distinction between the two kinds of variables. This causes a ‘dangerous’ confusion with regard to stock and flow variables. According to Gardner, “... almost no other single source of confusion is more dangerous in economic theory—not only to beginners, but sometimes also to advanced students in the field”²⁵. He cites some examples of certain variables which are open to such confusion. ‘Money is a stock variable’ but when it is exchanged for goods, it becomes ‘flow’; ‘income is flow, wealth [accumulated income] is stock’; ‘saving is a flow’ but ‘accumulated saving is a stock; and investment is a flow’ but accumulated investment ‘is a stock’. He has suggested, “Upon encountering any variable, the student should spend a moment determining whether it is a stock, a flow, or a ratio concept. ... Much confusion will be saved by this exercise.”

1.6.2 Equilibrium and Disequilibrium

The concepts of equilibrium and disequilibrium are widely used in both microeconomic and macroeconomic analyses. Here, we describe briefly the concepts of equilibrium and disequilibrium as applicable to macroeconomic analysis.

Equilibrium

The term ‘equilibrium’ has been formed by combining two Latin words—*aqui* meaning ‘equal’, and *libra* meaning ‘balance’. Thus, ‘equilibrium’ means ‘equal balance’. In general sense, it means a state of balance between the opposite forces. In economic sense, equilibrium refers to a state or situation in which opposite economic forces, e.g., demand and supply, cost and benefit, etc., are in balance and there is no in-built tendency to deviate from this position. Machlup defines equilibrium as “a constellation of

interrelated variables so adjusted to one another that no inherent tendency to change prevails in the model which they constitute"²⁶. At macro level, an economy is said to be in equilibrium when *aggregate demand* equals *aggregate supply*. Aggregate demand is the sum of demands for all consumer and capital goods and services, given the aggregate demand for money. Aggregate supply is the sum of the supply of all consumer and capital goods and services, given the aggregate supply of money. As long as equilibrium is not disturbed by internal or external disequilibrating factors, the economy remains in equilibrium.

Disequilibrium

Disequilibrium refers to the state of economy in which the opposite forces, e.g., aggregate demand and supply and aggregate saving and investment, are not in balance. The factors causing disequilibrium arise out of the working process of the economy. The working of a market economy involves a large number of interrelated and interacting economic variables and it is a rare possibility that all market factors strike a simultaneous balance and ensure a stable equilibrium. In fact, imbalances between economic factors and forces are a routine matter in a market economy. The reason is that the economic activities are undertaken by millions of decision makers—consumers, producers, workers, bankers, exporters, importers, and the government, and their decisions may not always coincide. The result could be disequilibrium in the economy. In theoretical analysis, however, disequilibrium is assumed to be caused by imbalance between determinant factors caused by external factors.

1.6.3 Partial Equilibrium and General Equilibrium Analysis

Two other concepts which are often used in macroeconomic analyses are *partial equilibrium* and *general equilibrium*. While microeconomics uses, in general, partial equilibrium analysis, macroeconomic analysis is largely of general equilibrium nature²⁷. In macroeconomics, the partial equilibrium concept is applicable only to sectoral analysis, i.e., when the macroeconomic analysis is confined either to the product sector or to the

monetary sector. The meaning and application of these concepts are described here briefly.

Partial Equilibrium Analysis

Conceptually, partial equilibrium analysis is the analysis of a part or an element of the economy, isolated and insulated through assumptions from the influence of changes in the rest of the economy. In simple words, when only a part of the economy or economic phenomenon is analysed in isolation of the rest of the economy, the analysis is *partial equilibrium analysis*. Partial equilibrium analysis is widely used in *microeconomic analysis*. Partial equilibrium analysis is based on a *ceteris paribus* assumption that all other related factors and related variables, specially the closely related ones, remain constant. In *macroeconomics*, partial equilibrium analysis is used when equilibrium conditions of entire *product sector* and entire *money sector* are analysed separately in isolation of one another. For instance, John Maynard Keynes analysed *product sector* equilibrium and *monetary sector* equilibrium separately, though both the sectors are interconnected and interdependent. Therefore, his macroeconomic analysis of product and money sectors is generally treated as *partial equilibrium analysis*.

General Equilibrium Analysis

General equilibrium analysis is carried out where the objective is to analyse the economic system as a whole without using the restrictive assumptions of the partial equilibrium analysis. General equilibrium analysis is carried out by taking into account the interrelationships and interdependence between the various relevant elements of the economy. It allows all the interrelated factors to vary in reaction to one another and seeks to analyse the simultaneous equilibrium of all the prices and output of all the related goods and it shows how equilibrium of all related sectors or markets is simultaneously determined. General equilibrium analysis takes a comprehensive and realistic view of the economic system. From a practical point of view, the general equilibrium analysis is of immense importance in identifying and explaining the causes and effects of the economic disturbances. From theoretical point of view, it provides a reasonable

framework for the formulation of the theories of economic growth, employment and income determination. It examines economic problems from the macro angle and in macroeconomic perspective.

It must however be borne in mind that macroeconomics does not use the Walrasian type of general equilibrium analysis wherein it seeks to analyse the equilibrium of *each and every element* of economic system. Macroeconomics uses highly aggregated variables like aggregate demand, aggregate supply, the *GNP*, overall employment, stock of nation's capital, total demand for and total supply of money, etc. As mentioned above, it studies the interrelationships and interdependence of these macroeconomic variables and seeks to determine the general equilibrium of the economy.

1.6.4 Static, Comparative Static and Dynamic Analyses

Static and dynamic analyses²⁸ refer to two methods of analysing a subject matter of macroeconomics. When an economic phenomenon is analysed under static conditions, i.e., under the assumption of all the model variables to remain constant at a point of time, the analysis is called 'static analysis' and when an economic phenomenon is analysed under changing conditions, it is called 'dynamic analysis'. Macroeconomic studies of an economic phenomenon are carried out under both static and dynamic conditions. The nature of static and dynamic economic analyses is described below.

Static Analysis

In general sense of the term, 'static' means a 'state of rest' or 'a state of motionlessness'. In reality, however, an economy is never in the state of rest. People in an economy are continuously engaged in economic activities—production, exchange, consumption, etc.—with or without changing the size of the economy. Nevertheless, for the purpose of analysing an economy at a point of time, the economists assume a 'static economy'. "Static economy does not mean an economy in which no activity is taking place or no one is doing anything at all. ... No economic system is ever at rest in anything like the mechanical sense"²⁹. A static economy means an

economy in which normal activities go on but there is no change in the size of the economy, i.e., there is no change in the level of national output, stock of capital, prices and employment. As Schumpeter puts it, a static economy refers to “an economic process that merely reproduces itself”³⁰.

When an economy is studied under static conditions, it is called *static analysis*. For static analysis, a static model is used. A model of a static economy is created by a “rigorous formulation of conditions [assumptions] under which it is possible to make generalisations about the factors determining economic equilibrium”³¹. A static macro-model assumes that there is no change in the size of the economy, no change in national output, prices and employment. The economic process in a static economy merely produces itself year after year. Such an economy is said to be in a state of *static equilibrium*. According to Harrod, “... a static equilibrium by no means implies a state of idleness, but one in which work is steadily going forward day-by-day and year after year but without increase or diminution”³².

Another important feature of static analysis is that the *variables used in the static model have no past or future and all the variables belong to the same point in time*, i.e., past value and predicted future value of the variables are ignored. Thus, a static model is the construction of a timeless economy. In a static model, the values of all the interrelated variables are simultaneously and instantaneously determined. In other words, there is no time lag in the adjustment of the dependent variables to the change in the independent variables. This kind of approach to the study of an economic phenomenon is essentially a theoretical approach. The prime objective of constructing a static model is to make a generalisation or theoretical proposition regarding the relationship between the related variables under static conditions.

Comparative Static Analysis

Comparative static analysis is a comparative study of economic conditions of an economy at two static equilibrium positions at two different points in time. In a comparative static analysis, “... we are comparing the equilibrium values of the system corresponding to the two equilibrium

positions with one another. This sort of comparative analysis of two equilibrium positions may be described as comparative static analysis ..."³³ A comparative study of this kind assumes a great significance where the objective of the study is to predict the future course of the economy on the basis of the past experience. A comparative analysis of the relationships between the variables at two equilibrium positions at two different points of time is helpful in tracing the change in their relationships. This approach has a great predictive power, especially when changes are few and small and the economy treads smoothly from one equilibrium position to another.

Dynamic Analysis

In contrast to the static approach, the dynamic approach is adopted to study an economy in motion. When a macroeconomic phenomenon is analysed under changing or dynamic conditions, it is called **dynamic analysis**. Dynamic analysis is adopted to study an economy under dynamic conditions. In a dynamic economy, the economic factors and forces keep changing. An economy in motion raises certain issues which cannot be handled through static and even comparative static approaches. The two such major issues are following:

1. Does a dynamic economy, when displaced from one equilibrium, ever reach another equilibrium position?
2. Which path a dynamic economy is likely to take to move from one equilibrium position to another?

The merit of dynamic analysis lies in its power to predict the future course of the economy. A static analysis, by its very nature, has no power to predict the path that a dynamic economy takes while moving from one equilibrium point to another, nor it can be used to predict whether the economy will ever attain another equilibrium position. Dynamic approach does solve this problem.

Economic dynamics refers to the 'factors and forces' that set an economy in motion and lead it to a new equilibrium at a higher or lower level. Economic dynamics studies the actions of, and interactions between, the factors and forces of change. The interaction between the factors and forces of change is not instantaneous and simultaneous. It involves a *time-lag*, i.e.,

services. Economic transactions generate two kinds of flows: (i) product or goods flow, i.e., the flow of goods and services, and (ii) money flow. Product and money flow in opposite directions in a circular pattern. The product and money continue to flow incessantly. This is how the economy works.

2.1 ECONOMY AS A CIRCULAR FLOW OF PRODUCTS AND MONEY

In a monetised economy, the flow begins with the flow of factors of production. The flow of factors of production generates money flows in the form of *factor payments*. Factor payments take the form of factor *income flows*. Factor incomes are spent on consumer and capital goods, which take the form of *expenditure flow*. Expenditure flow is in the form of *money flow*. Both product and expenditure flow in a circular pattern in opposite directions. The entire economic system can therefore be viewed as circular flow of factor incomes and expenditure. The magnitude of these flows, in fact, determines the size of national income. How these flows are generated and how they make the system work are the subject matter of this chapter.

It may be noted at the outset that the flow mechanism of goods and money is extremely complex in reality. The economists, however, use simplified models to illustrate the *circular flows of income and expenditure*. To present the flows of goods and money, the economy is divided into four sectors: (i) household sector, (ii) business sector or the firms, (iii) government sector, and (iv) foreign sector. These four sectors are combined in different models to make the following three models for the purpose of illustrating the circular flows of income and expenditure, and of product and money.

1. Two-sector model including the household and business sectors
2. Three-sector model including the household, business and the government sectors
3. Four-sector model including the household, business, the government and the foreign sectors.

The circular flow of goods and money in the above three models are discussed and illustrated in the following subsequent sections.

2.2 CIRCULAR FLOWS IN THE TWO-SECTOR MODEL

The two-sector model is a model of a simplified economy. It is assumed to consist of only two economic sectors, viz., households and firms. This model excludes the product and money flows generated by the government and the foreign sectors. The two-sector model is obviously an unrealistic model. However, to begin with, a two-sector economy provides a convenient starting point to analyse the circular flows. Before we analyse the circular flows, let us look at the basic features and functions of the households and the firms.

Households

- The *households* are assumed to possess certain specific features: (i) households are the owners of all the factors of production—labour, land, capital and entrepreneurship¹, (ii) their total income consists of returns on their factors of production—wages, rent, interest, and profits, (iii) they are the consumer of all the consumer goods and services; and (iv) they spend their total income on goods and services produced by the firms—if they save any part of their income, it flows to the firms in the form of investment. Households are, in fact, the main determinants of the volume of circular flows of products and money.

Business Firms

The *business firms*, on the other hand, are assumed to have the following features and functions: (i) firms do not own resources of their own, (ii) they hire the factors of production—land, labour and capital—from the households, (iii) they use the factors of production and produce and sell goods and services to the households; and (iv) they do not save, that is, there is no corporate saving.

Assumptions

The following assumptions are made to specify the two-sector circular flow model:

1. The households spend their total income on consumer and capital goods produced by the firms. They do not hoard any part of their income.
2. The firms produce goods and services only as much as demanded by the households. They do not maintain any *inventory*.
3. The firms make factor payments to the households as rent, wages, interest, and profits.
4. There is no inflow or outflow of income or of goods and services from any external source.

Having specified the model, we now describe and illustrate the circular flows of income and expenditure in two-sector model.

2.2.1 Circular Flows in Two-Sector Economy: A Graphic Presentation

The working of a two-sector model economy and the circular flows of incomes and expenditure are illustrated in Fig. 2.1. The households are represented by the rectangle labelled 'Households' and the business sector by the rectangle labelled 'Firms,' with their respective characteristics. A line drawn from the 'Household' to the 'Firms' divides the diagram into two parts—the upper half and the lower half. The upper half represents the **factor market** and the lower half represents the **commodity market**. Both the markets generate two kinds of flows—**product flows** and **money flows**. Let us first look at the product (real) and money flows in the factor markets.

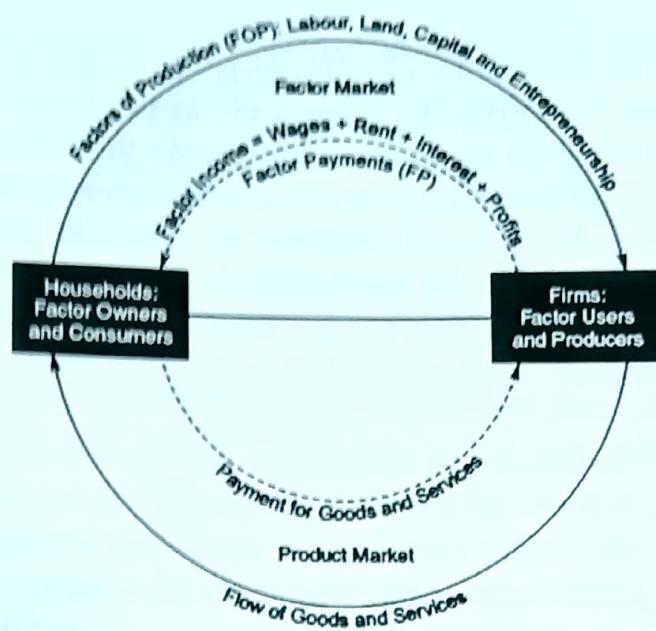


Fig. 2.1 Circular Flows of Income and Expenditure in Two-Sector Model

In the factor market (the upper half), the arrow labelled 'FOP' shows the flow of factors of production (FOP) from the households to the firms. This makes the factor flow shown by a continuous arrow. The factor flow causes another and a reverse flow, that is, the money flow in the form of factor payments (wages, interest, rent and profits) from the firms to the households. Since all factor payments (PF) are made in terms of money, the flow of factor incomes represents the money flow. The money flow, shown by a dashed arrow, comprises the total income (Y) of the households. Note that the factor services and the money flow in the opposite direction.

Let us now look at the *commodity market* (the lower half of the diagram). As shown in the diagram, the goods and services produced by the firms flow from the firms to the households. The payment made by the households for the goods and services creates money flow. Note again that the goods and money flow in the commodity market too flow in the opposite direction.

When we combine the goods and money flow in the factor and goods markets and look at the flows in continuity, we find a *circularity* in the flows. By combining the continuous arrows in the goods and factor

markets, we get the circular flow of goods. As shown in Fig. 2.1, the factors of production flow from the households to the firms. The firms convert factors of production into goods and goods flow from the firms to the households. This process continues. By the same process, money flows from the firms in the form of factor payments to the households. Then money flows back from the households to the firms for payment of goods. This process continues. As Fig. 2.1 shows, *goods and money flow in the opposite directions*.

Important Identities

One striking feature of the flow of money, as income and expenditure flows, is that the *values* that flow are *equal*. For example, *factor payments* are equal to *factor income* and *household expenditure* equals the *value of output*. These equalities take the form of *identities* as follows:

$$\begin{aligned} Y &\equiv FP \\ FP &\equiv w + r + i + p \\ w + r + i + p &\equiv V \\ \therefore V &\equiv Y \equiv M \end{aligned}$$

where, Y = household income, FP = factor payments, w = wages, r = rent, i = interest, p = profits, V = value of output, and M = Money flow (at constant prices).

In the final analysis, household income = factor payments = the money value of output, i.e.,

$$Y \equiv FP \equiv V$$

This identity is important for the national income determination.

2.2.2 Withdrawals, Injections and the Size of Income Flows

The magnitude of income and expenditure flows is determined by the size of the society's income and expenditure: the larger the size of income (or expenditure), the larger the size of flows and vice versa. In reality, however, there are *leakages* from and *additions* to the circular flows of income and

expenditure. The leakages and additions are also called *withdrawals* and *injections*,² respectively.

In the two-sector model, a *withdrawal* means the amount that is set aside by the households and firms and is not spent on the domestically produced goods and services over a period of time. For example, if households set aside a part of their income as a provision for old age or as a provision against the loss of job, and so on, and do not spend it unless required, it is a *withdrawal*. It is important to note that *saving is a withdrawal*. But when savings are ultimately spent in the form of investment, they take the form of *injections*. The withdrawals are comparable to the concept of hoarding.³ Similarly, the firms may also withhold a part of their total receipts and may not return it to the circular flows in the form of factor payments, say, in anticipation of depression. Such withdrawals reduce the size of the circular flow.

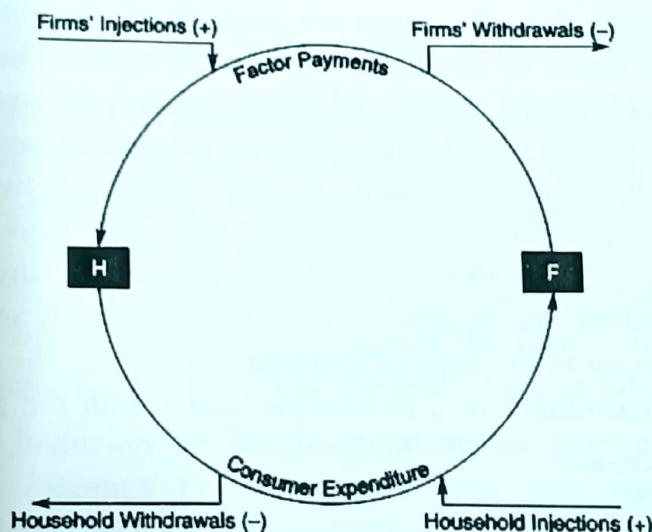


Fig. 2.2 Withdrawals and Injections in the Circular Flows

On the other hand, an *injection* is the amount spent by the households and firms in addition to their regular incomes and receipts. An injection by the households is the expenditure that they make in addition to what they receive from the firms as current factor incomes. The injections by the households may be in the form of spending inherited savings, own hoardings, or by borrowing and spending on consumer goods. And, an

injection by the firms is the expenditure which they make in addition to what they receive from the sale of goods and services. Firms can inject money into the economy by spending their past savings or by borrowing from the outside of the model economy. *Injections increase the size of the flow.*

The withdrawals and injections in the two-sector model are illustrated in Fig. 2.2. The lower half of the figure shows the withdrawals and injections by the households and the upper half shows the withdrawals and injections by the firms.

Two-Sector Model with Capital Market

We have hitherto assumed that the households supply finances directly to the firms. In reality, however, household savings flow to the banks and from banks to the firms. In order to explain the role of savings on the circular flows, we assume that *all savings are made by the households* and extend the two-sector model by including the *financial sector*. The financial sector (known also as financial market and capital market) is constituted of a large variety of institutions involved in collecting household savings and passing them on to the business sector. In our simplified two-sector model, however, the financial sector includes only the banks and financial intermediaries (FIs), like insurance companies, industrial finance corporations, which accept deposits from the households and invest them in the business sector in the form of loans and advances. The circular flows of income and expenditure in a two-sector model with the capital market is illustrated in Fig. 2.3.

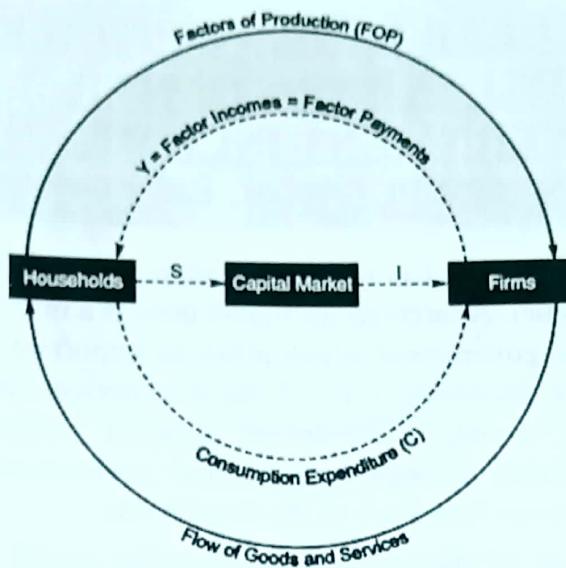


Fig. 2.3 Circular Flows in Two-Sector Model with the Capital Market

Note that the flow of factors of production and factor payments in Fig. 2.3 are the same as in Fig. 2.1. In Fig. 2.3, a new sector, labelled as ‘Capital Market’ has been added. The dashed arrow, labelled S , shows the flow of household savings to the capital market, i.e., to the banks and financial intermediaries (FIs) in the form of deposits. The banks and FIs use the deposits to buy shares and debentures of the firms which is investment (I). The investment flow is shown by the dashed arrow labelled I .

With the inclusion of the financial sector as the capital market, the households incomes (Y) is divided into two parts: (i) consumption expenditure (C), and (ii) savings (S). As shown in Fig. 2.3, C and S take different routes to reach the business sector. The consumption expenditure (C) flows directly to the firms, whereas savings (S) are routed through the financial sector. Note that the savings (S) take ultimately the form of investment (I). In the final analysis, we find that the entire money income generated by the firms flows back to the firms and it flows back again to the households as factor payments.

2.3 CIRCULAR FLOWS IN THREE-SECTOR MODEL: A MODEL WITH GOVERNMENT INCOME AND EXPENDITURE

The three-sector model is formed by adding the government sector to the two-sector model. A three-sector model depicts a more realistic economy as it includes the government which plays an important economic role in the economy. The economic role of the government, in the context of the circular flow model, refers to the flow of household income to the government funds through taxation and government expenditure which makes tax revenue flow back to the households.

The inclusion of the government into the model requires adding and analysing the effects of the government's fiscal operations—*taxation* and *expenditure*.

Taxation is the withdrawal from the income flows to the households. Taxation reduces private disposable income and, therefore, consumption expenditure and savings. On the other hand, the government expenditure is an injection into the income stream. The government expenditure adds to the aggregate demand in the form of government purchases of factor services from the households and goods and services from the business sector. The transfer payments made by the government (e.g., old age pensions, subsidies, unemployment allowance, etc.) are injections to the circular flows. They add to the household income which leads to an increase in household demand for consumer goods.

The circular flows of incomes and expenditures in three-sector model are shown in Fig. 2.4. This figure presents only the money flows to and from the government. The real (or goods) flow from and to the government has been excluded in order to avoid overcrowding of the diagram. It must be borne in mind that each money flow (except transfer payments) has a counterflow in the form of goods flow.

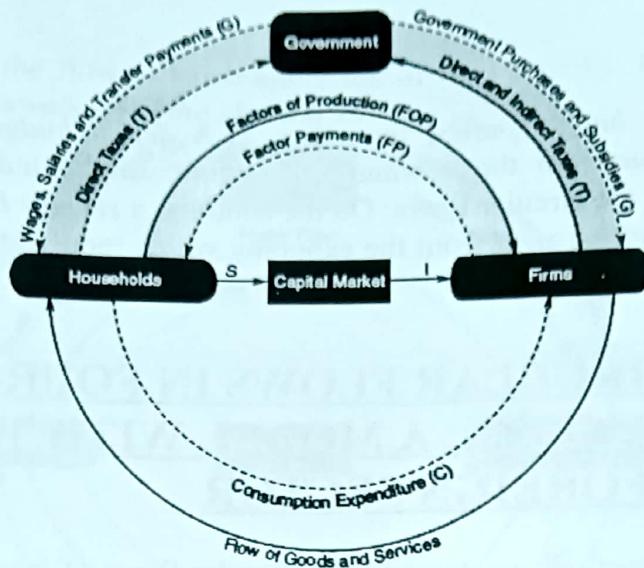


Fig. 2.4 Circular Flows of Income and Expenditure in Three-Sector Model

In Fig. 2.4, the circular flows of income and expenditure are the same as in Fig. 2.1. However, it is important to bear in mind that the magnitude of flows between the households and the firms gets reduced because a part of their incomes flow to the government sector. As the figure shows, a part of the household income is taken away by the government in the form of direct and indirect taxes. Similarly, a part of the firms' earning is taxed away in the form of corporate income tax. The indirect taxes are collected by the firms from the households and passed on to the government. The government spends a part of its tax revenue on wages, salaries and transfer payments to the households and a part of it on purchases from the firms and payment of subsidies. Thus, the money that flows from the households and the firms to the government in the form of taxes, flows back to these sectors in the form of government expenditure.

Is the government tax revenue (T) always equal to the government expenditure(G)? In Fig. 2.4, total tax revenue is assumed to be equal to the total government spending. In reality, however, the two variables may not be necessarily equal. It depends on the government budgetary policy. If the government adopts a *balanced budget policy*, then $G = T$. If the government adopts a *deficit budget policy*, then $G > T$. And, if the government follows

surplus budget policy, then $G < T$. A *deficit budget policy* implies *net injections* into the economy. Therefore, these kinds of budget policies expand the circular flows. On the contrary, a *surplus budget policy* amounts to *net withdrawal* from the economy which reduces the size of the circular flows.

2.4 CIRCULAR FLOWS IN FOUR-SECTOR MODEL: A MODEL WITH THE FOREIGN SECTOR

In this section, we describe the circular flows of income and expenditure in a four-sector model—the final and the realistic model. The four-sector model is formed by adding foreign sector to the three-sector model. The foreign sector consists of two kinds of international transactions: (i) foreign trade, that is, export and import of goods and services, and (ii) inflow and outflow of capital, i.e., international investment. The international transactions take place through a complex system. For simplicity sake, however, we make the following assumptions:

1. The external sector consists of only export and import of goods and services.
2. The export and import of goods and non-labour services are made only by the firms.
3. The households export only labour.

The circular flows of income and expenditure in a four-sector model is illustrated in Fig. 2.5. Like Fig. 2.4, this figure too shows only the money flows. It must be borne in mind that each money flow has its counterpart goods flow in the opposite direction. The lower part of this figure shows the circular flows of money in respect of foreign trade. Exports (X) make goods and services flow out of the country and make money (foreign exchange) flow into the country in the form ‘receipts from export.’ This is, in fact, flow of foreign incomes into the economy. *Exports (X) represent injections into the economy*. Similarly, imports (M) make inflow of goods and services from abroad and flow of money (foreign exchange) out of the

country. This is the flow of expenditure out of the economy. **Imports (M) represent withdrawals from the circular flows.**

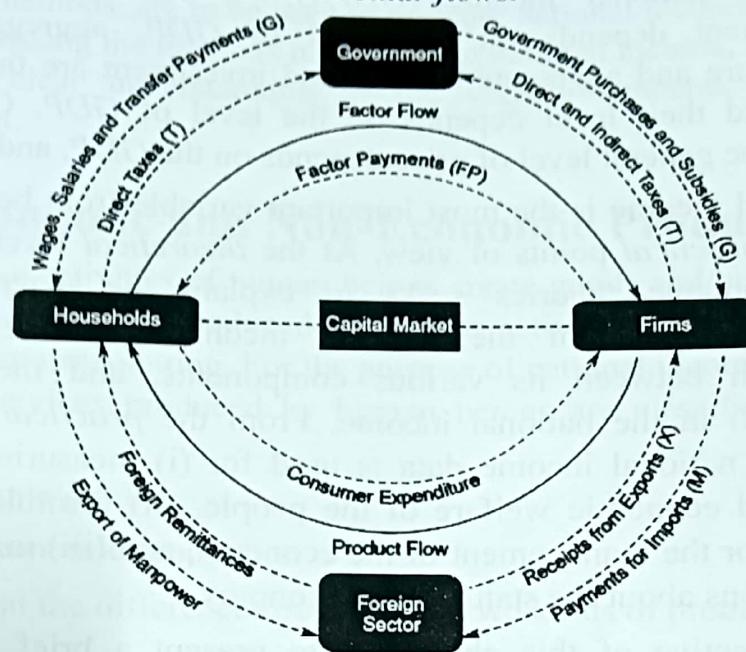


Fig. 2.5 Circular Flows of Income and Expenditure in Four-Sector Model

Another inflow of income is generated by the ‘export of manpower’ by the households. The export of manpower brings in ‘foreign remittances’ in terms of foreign exchange. This is another inflow of income. These inflows and outflows go on continuously so long as there is foreign trade and export of manpower.

So far as the effect of foreign trade on the magnitude of the overall circular flows is concerned, it depends on the *trade balance*, which equals $X - M$. Recall that X represents injections and M represents withdrawals. If $X > M$, it means that inflow of foreign income is greater than the outflow of income. It implies that there is a net injection into the economy arising from foreign trade. The net gain from foreign trade increases the magnitude of circular flows of income and expenditure. By the same logic, if $X < M$, there is net withdrawal from the economy and it decreases the magnitude of circular flows. And, if $X = M$, inflow and outflow of incomes are equal. This leaves the circular flows unaffected.

aggregates, national income is the 'most macro' of all macroeconomic variables. All other macro variables are either the components of or are the result of national income (*GDP/GNP*). For instance, the level of employment depends on the level of *GDP*, aggregate consumption expenditure and aggregate savings and investment are the components of *GDP*, and their level depends on the level of *GDP*. Given the money supply, the general level of price depends on the *GDP*, and so on.

National income is the most important variable from both the *theoretical* and the *practical* points of view. At the *theoretical* level, a major part of macroeconomic theories seeks to explain the determination of the equilibrium level of the national income, the interrelationship and interaction between its various components, and the growth of and fluctuation in the national income. From the *practical point* of view, a country's national income data is used for (i) measuring the standard of living and economic welfare of the people, (ii) formulation of economic policies for the management of the economy, and (iii) making international comparisons about the status of the economy.

The objective of this chapter is to present a brief discussion on the concepts used in national income estimation and on the methods of national income estimation with examples of methods used in India.

3.1 SOME CONCEPTS RELATED TO NATIONAL INCOME

In general sense of the term, 'national income' refers to the aggregate money value of all final goods and services resulting from the economic activities of the people of a country over a period of one year. Given this definition of national income, it appears that measuring national income is an easy task. However, making a reliable measure of national income is an extremely complex and difficult task. Measuring national income is a complex task because it involves many conceptual problems. The conceptual problems arise because the term 'national income' is used in a variety of senses depending on (i) what is a productive and what is a non-productive activity? (ii) within the productive activities, what is economic

and what is non-economic production? (iii) what is to be included in, and what should be excluded from, the national income concept? and (iv) what method, or methods, are to be used to measure national income? Therefore, prior to discussing the methods of measuring national income, it is essential to have a clear understanding of the various concepts used in its measurement.

3.1.1 Economic and Non-Economic Production

All productive activities of human beings create goods and/or services, but all goods and services produced by human activities are not included in national income accounting. For the purpose of national income accounting, goods and services produced by human beings are classified under two categories:

1. Economic production
2. Non-economic production

Let us look at the differences between the two kinds of production.

Economic Production

In economic-sense, *economic production* refers to the goods and services which are produced for sale and have a market value, and the goods and services which are produced and provided to the people jointly by the government and public organisations. Thus, economic production includes both *marketable* and *non-marketable* production. Goods and services produced by farmers, firms, factories, shops, hoteliers, tailors, lawyers, medical practitioners, etc., fall in the category of *marketable production*. And, the goods and services produced and supplied by the government, public institutions, social organisations, NGOs, social service clubs, charitable societies, etc., fall in the category of *non-marketable production*. The government provides administrative services, law and order, judiciary services, national defence, educational and medical services, etc. These services (except medical and educational services) cannot be provided individually, and they do not have a market and market price. But, all these services use national resources—land and labour—which have an economic cost, and they add to the production capacity, and to the welfare of the

society. Production of all such goods and services falls in the category of *Economic Production*. It must, however, be noted that *all marketable production is economic production but all economic production is not marketable*, e.g., *public goods*. But all the goods and services of this category are included in national income accounting.

Non-Economic Production

Non-economic production includes the production of goods and services that are not meant to be sold, nor is there any market for them, nor do they have a market price, even though they add to human welfare. To this category, belong mainly the following services:

1. Services rendered to self, e.g., exercising, acquiring knowledge, shaving, washing one's own clothes, self entertainments, hobbies, cooking for self, etc.
2. Services provided by the family members to the family members, e.g., housewives cooking for the family and looking after the household, parents teaching their own children, mothers rearing the children, providing nursery help, doctors treating their own family members, gardening in one's own house campus, etc.
3. Services provided by the neighbours to each other, e.g., helping each other on festivals and marriage occasions, social works, etc.

Although these non-economic products contribute to human welfare like any economic good and can be valued at an imputable rate, these products are not included in the measurement of the national income as these services cannot be valued at market rate.

3.1.2 Intermediate and Final Products

In estimating national income, a problem of *double counting* arises, i.e., the value of the same product is counted more than once. Double counting of products results in overestimation of national income. Therefore, with the purpose of encountering the problem of double counting in national income accounting, the goods and services produced in a country are classified as *intermediate and final products*. National income includes the value of only final products—be it a good or a service. Let us understand the distinction

between *intermediate* and *final goods* and its importances in national income accounting.

Intermediate and Final Goods

In the process of production, certain goods, called *material inputs*, pass from one stage to another, with their form changing, until the product reaches its final stage. Such products are called *intermediate products*. Thus, the goods that flow from one stage to another in the process of production of a good, with their form changing, are called *intermediate products*. The goods that reach the final stage of production and flow to their ultimate consumers/users are called *final products*. Practically, a product sold by one firm to another for resale, or for further processing or value addition, in the process of production is also called *intermediate product*, and a product that is sold finally to the consumer or to the investor is *final product*.

Final goods are classified under two categories: (i) final consumer goods, and (ii) final producer goods or capital goods. *Final consumer goods* are those that flow to the ultimate consumers. *Final capital goods* (machinery, plant and equipment) are those that are finally used by the firms in the process of production. Final capital goods are also called '**Investment goods**'.

Example

The distinction between intermediate and final products, in case of consumer goods, can be clarified further with an example. Let us consider the production of sandwiches. Initially, the sandwich was in the form of wheat. In the process of sandwich production, wheat flows from the farmers to flour mills, from flours mills to bakeries, and from bakeries to restaurants, where bread is converted into sandwiches – the final product – which are sold finally to the consumers. Note that in the process of sandwich production, wheat flows from one stage to another but its form keeps on changing – from wheat to wheat-flour, from wheat-flour to bread, from bread to sandwich, the final product. In this case, wheat, wheat flour and bread are *intermediate products* and sandwich is the *final product*.

As noted above, the need for distinction between the intermediate and final products arises because of the problem of ***double counting***, i.e., the value of the same product counted more than once in national income accounting. In our example of sandwich production, wheat is converted into flour, wheat-flour is converted into bread, and bread into sandwich. At each stage of production, the products—wheat, flour, bread and sandwich—are priced differently. Wheat price is included in the price of flour, in the price of bread, and in the price of sandwiches. Therefore, if the total value of all these products—wheat, wheat-flour, bread and sandwich—is taken into account in national income counting, wheat price would be counted *four times, wheat flour price three times and bread price twice*. In economic terminology, this is called ***double counting***, even though it is counted multiple times. Double counting leads to overestimation of the national income.

Intermediate and Final Services

The double counting problem arises also in case of services provided by the firms and the government. Whether the service provided by the private firms and by the government is an intermediate product or a final product is a rather ticklish issue. The classification of services under the intermediate and final product categories depends on the purpose of their use. For example, services provided by the government, like transport, postal, water communication, etc., at a cost are used for both production and consumption purposes. When used for production purpose, these services are treated as ***intermediate products*** and when used for private consumption, they are treated as ***final products***. For example, the part of railway services used for transporting production materials are treated as intermediate service product, and railway service used by the travellers for travelling from one place to another for personal purposes is treated as final service product. Similarly, postal services provided to business firms are intermediate products and those provided to households are treated as final products. Bus services are regarded as final products as they are used for commuting from one point to another. However, there is a difference of opinion among the economists on the issue of treatment of services as

intermediate and final products. It all depends on the practice adopted by the authority assigned the task of estimating national income.

3.1.3 Transfer Payments

Transfer payments are the payments made by the people to the people, and by the people to the government without corresponding transfer of goods and services. In other words, transfer payment refers to the flow of money without a reverse flow of goods or services. For example, when a person gifts some money to a relative or friend, or donates an amount to a poor person or to a charitable organisation, without receiving anything in return, it is a *transfer payment*. Similarly payment of taxes by the people to the government and payment of old-age pension by the government to the retired employees are treated as *transfer payments* in national income accounting.

It is important to note here that *transfer payments* are not taken into account while counting the national income because such payments do not make any addition to the total production nor do they add any additional value to the society.

However, the concept of *transfer payment* at times becomes disputable. To use Beckerman's example², when a father pays some money to his son as pocket money, it is transfer payment. But, if the son cleans his father's car in return to pocket money, the question arises 'should father's payment to the son be treated as a transfer payment or as a payment in return for son's service. In such cases, an arbitrary approach is adopted or a value judgment is used. Therefore, practice varies from country to country. According to him, "... the dividing line between what is and what is not productive activity is arbitrary in any system of national accounts, including the system adopted by nearly all Western countries."³

3.1.4 Consumer and Producer Goods

All *final products*, as discussed above, can be classified under two categories: (i) consumer goods, and (ii) producer goods or capital goods. The goods and services that are consumed by the people to directly satisfy

their needs and yield utility to the consumer are *consumer goods*. For example, food, clothes, house, personal cars, household goods, petrol, books, etc., consumed or used by the people of a country are all *consumption goods*. Also, the total annual expenditure by the government on staff salaries, education, health care, and law and order represent government consumption expenditure. Thus, the services created by the government are consumer goods.

As regards the *producer goods*, the category of final products which are not used as consumer goods but are used for enhancing the productive capacity of the national economy with the purpose of increasing the flow of income in the future are treated as producer goods. Such goods are also called *capital goods*. Capital goods are the man-made means of production including machinery, tools and equipment; corporate, educational, hospital and factory buildings; roads, railways, airports and aeroplanes, etc. All such final products are *producer goods*.

3.2 DIFFERENT KINDS OF MEASURES OF NATIONAL INCOME

Having discussed the conceptual problems, we discuss now the different kinds of measures of national income used in national income analysis and in economic policy formulations. Also, different concepts of national income are used in economic analysis depending on (i) what is included and what is not included in the national income estimates, and (ii) what method is used for estimating the national income. In this section, we describe briefly the main concepts and measures of national income.

3.2.1 Gross Domestic Product (GDP)

The Gross Domestic Product (*GDP*) can be defined as the sum of market value of all the *final goods and services* produced in a country during a specific period of time, generally one year. It is important to note here that in estimating *GDP* of an open economy, the income earned by the foreigners in the country are *included* and the income earned by the residents abroad and remitted to the home country are excluded. In simple

words, *GDP* includes income earned by the foreigners in the country and excludes income earned abroad by the residents.

The market value of domestic product is obtained at both *constant* and *current prices*. Accordingly, *GDP* is known as '*GDP at constant prices*' and '*GDP at current prices*', respectively.

Measuring *GDP* at 'the market value of all final goods and services' is beset with the following problems:

1. Determining what is 'final' and what is not, to avoid the problem of double counting
2. Evaluation of non-marketed goods and services, e.g., farm products produced and consumed by farmers themselves and rental value of owner-occupied houses, etc.
3. Accounting of incomes from illegal activities and professions, e.g., smuggling, production and sale of prohibited goods, like narcotics and arms, etc.
4. Accounting of unsold stocks and inventories
5. Distortion of prices due to indirect taxes

In practice, these problems are resolved by the national income estimating agency. For instance, in India, the Central Statistical Organisation (*CSO*) finds ways and means to account for these problems.

Alternatively, the *GDP* can also be defined and measured as the *sum of all factor payments* (wages, interest, rent, profit and depreciation). It is then called '***GDP at factor cost.***'

3.2.2 Gross National Product (GNP)

The Gross National Product (*GNP*) is another measure of national income which often figures in macroeconomic analysis and policy formulations. The concept of *GNP* is similar to that of *GDP* with a significant difference, of course. *The concept of GNP includes the income of the resident nationals which they receive abroad, and excludes the incomes generated locally but accruing to the non-nationals.* In case of *GDP*, however, it is just the otherway round. *The GDP includes the incomes locally earned by the non-*

nationals and excludes the incomes received by the resident nationals from abroad. A comparative definition of *GNP* and *GDP* is given below:

GNP = Market value of domestically produced goods and services

plus the incomes earned by the residents of the country in foreign countries

minus the incomes earned by the foreigners in the country

GDP = Market value of goods and services produced by the residents in the country

plus the incomes earned in the country by the foreigners

minus the incomes received by residents of a country from abroad

3.2.3 Net National Product (NNP)

The concept of Net National Product (*NNP*) is closely related to the concept of *GNP*. The concept of *GNP* includes the output of both final consumer goods and capital goods. However, a part of capital goods is used up or consumed in the process of production of these goods. This is called *depreciation or capital consumption*. While *GNP* is gross of depreciation, *NNP* is net of depreciation. *NNP* is obtained by subtracting depreciation from *GNP*. That is,

$$\mathbf{NNP} = \mathbf{GNP} - \text{Depreciation or capital consumption}$$

The *NNP* is the measure of national income which is available for consumption and net investment to the society. The *NNP* is, in fact, the actual measure of national income. The *NNP* divided by the population of the country gives the per capita income.

3.2.4 Personal Incomes (PI)

Personal income (PI) can be defined as the sum of all kinds of incomes received by a person from all sources of incomes. Personal income includes wages and salaries, fees and commission, bonus, fringe benefits, dividends, interest earnings and earnings from self-employment. It also includes transfer incomes like pensions, family allowances, unemployment allowances, sickness allowances, old age benefits and social security

benefits. Personal income also includes the incomes earned through illegal means, e.g., bribe, smuggling, cheating, theft, prostitution, at least for the taxation purpose.

Personal Income and NNP

It is important to note here that the sum of personal incomes is not exactly the same as *NNP*. The reason is that *NNP* excludes certain items included in personal incomes and it includes some other items not included in personal incomes. *NNP* does not include many items of personal income, for example, transfer payments like social security benefits, pensions, old age allowances, and such other benefits. And, it includes undistributed profits of private companies, surpluses of public undertakings, and rentals of the public properties. However, *NNP* can be measured by making some additions to the personal income (*PI*).

The estimate of *NNP* can be expressed as follows:

$$NNP = PI + UDP + SPU + RPP$$

where, *PI* = personal income excluding items not included in *NNP*; *UDP* = undistributed company profits; *SPU* = surplus of public undertakings; *RPP* = rentals of public properties.

3.2.5 Some Other Income Concepts

There are some other income concepts used in the analysis of national income and in economic reports. Two of such important income concepts are briefly discussed below.

Disposable Income

In wider sense of the term, *disposable income* refers to personal income of the income earners against which they do not have any legally enforceable payment obligations. Legally enforceable payment obligations include such payment obligations as income tax, payment due against government loans, and fines and penalties imposed by legal authorities. In specific terms, however, disposable income can be defined as follows:

$$\text{Disposable income} = \text{Personal income} - (\text{personal income tax} + \text{fees} + \text{fines})$$

Private Income

Broadly speaking, all personal incomes are private incomes. However, the term *private income* is used in contrast to *public income*. For the purpose of national income accounting, *NNP* is generally divided into two parts: (i) private income, and (ii) public income. Public income is that part of *NNP* which accrues to the public sector, including the government administrative units and the government commercial undertakings. Thus, income accruing to the public sector is called *public income*. In contrast, incomes accruing to the individuals, including private sector earnings, transfer payments and undistributed profits of private companies are called *personal income*. By definition,

$$\text{Total Private Income} = \text{Net Domestic Product} - \text{Public Income}$$

National Income Concepts: Summary

1. GNP = Market value of final goods and services (including both consumer and capital)
plus the incomes earned by the national residents in foreign countries
minus the incomes earned locally but accruing to foreigners
2. GDP = Market value of goods and services produced by the residents in the country
plus the incomes earned locally by foreigners
minus the incomes received by the nationals from abroad.
3. $NNP = GNP - \text{Depreciation (or Capital Consumption)}$
4. $PI = NNP - (\text{Undistributed Company Profits} + \text{Surplus of Public Undertakings} + \text{Rentals of Public Property})$
5. Disposable income (Y_d) = $PI - \text{Personal Taxes}$

Some Accounting Relationships

1. GNP at factor cost *plus net* indirect taxes *less* depreciation = GNP at market price
2. GNP (at market price) *less* depreciation = NNP at market price

3. NNP at market price *less* indirect taxes *add* subsidies = NNP at factor cost
4. NNP at factor cost *minus* domestic income accruing to non-residents = NDP at factor cost
5. NDP at factor cost – [surplus of public undertakings + profits of statutory corporations + profit tax + income accruing to non-residents] + [interest on national debts + transfer payments] = Personal income
6. Personal income *less* direct taxes, fees, fines, etc. = Disposable income

3.3 NOMINAL AND REAL GNP⁴

The *GNP* and *GDP* are estimated at both current and constant prices. The *GNP* estimated at current prices is known as ***nominal GNP*** and *GNP* estimated at constant prices in a chosen year (called ‘base year’) is known as ***real income***. Similarly, *GDP* estimated at current prices and constant prices is called ***nominal GDP*** and ***real GDP***, respectively.

The need for estimating *GNP* (or *GDP*) at constant prices arises because *GNP* at the current prices produces a misleading picture of economic performance of the country when prices are continuously rising or decreasing. In a country having a high rate of inflation, the nominal *GNP* produces an inflated estimate of the national income and creates false sense of richness or economic growth.

This kind of misleading picture of an economy that *GNP* estimated at the current prices creates can be seen, for example, in Table 3.1. This table presents India’s *GNP* and its annual growth rates estimated at both current and constant prices during the period from 2000–01 to 2013–14. The *GNP* data given in Table 3.1 shows the difference between the nominal and real *GNP* of India. More obvious is the discrepancy between the annual growth rate of the nominal and real *GNP*. The table shows clearly that nominal *GNP* presents an inflated measure of India’s *GNP*.

Table 3.1 Nominal and Real *GNP* of India at Factor Cost : 2001–02 to 2013–14
 (Real GNP and GDP at 2004–05 Prices)

Year	<i>GNP</i> (₹ crore)		Annual Growth Rate (%)		<i>GDP</i> (₹ crore)	
	Nominal	Real	Nominal	Real	Real	Growth (%)
2000–01	1978010	2324681	7.3	3.8	2348481	4.1
2001–02	2155192	2453591	9.0	5.5	2474962	5.4
2002–03	2327174	2551975	8.0	4.0	2570935	3.9
2003–04	2605111	2755056	11.9	8.0	2775749	8.0
2004–05	2949089	2949089	13.2	7.0	2971464	7.1
2005–06	3364387	3228177	14.1	9.5	3253073	9.5
2006–07	3920042	3534849	16.5	9.5	3564364	9.6
2007–08	4561574	3879457	16.4	9.7	3896636	9.3
2008–09	5270644	4133292	15.5	6.5	4158676	6.7
2009–10	6070903	4488314	15.2	8.6	4516071	8.6
2010–11	7167053	4863886	18.1	8.4	4918533	8.9
2011–12(2R)	8314861	5201163	16.0	6.9	5247530	6.7
2012–13(1R)	9272110	5416659	11.5	4.1	5482111	4.5
2013–14(PE)	10344507	5673857	11.6	4.7	5741791	4.7

Note: Nominal *GNP* and *GDP* are estimated at current price; Real *GNP* and *GDP* estimated at constant price of 2004–05; (1R) = First Revision; (2R) = Second Revision; (PE) = Provision Estimate.

Source: *Economic Survey – 2013–14: Statistical Appendix*, Table 1.1, Table 1.3A and Table 1.4.

In order to avoid this kind of misleading estimates of national income, *GNP* is also estimated at *constant* prices for a chosen base year. The *GNP* estimated at constant prices of the base year is called **real GNP**: it gives national income estimates free from distortion caused by inflation or deflation. However, estimating *GNP* at the prices of the base year is not an easy task. The economists use a simple adjustment factor called *GNP Deflator* or *National Income Deflator* to eliminate the effect of rising prices on the *GNP* and to work out real *GNP* at the base year prices. Let us now see how ‘*GNP deflator*’ is worked out and applied to estimate the real *GNP*.

3.3.1 GNP Deflator and its Application

The GNP deflator is essentially an adjustment factor used to convert nominal GNP into real GNP. The GNP deflator is the ratio of price index number (PIN) of a chosen year to the price index number (PIN) of the base year⁵. The PIN of the base year = 100. The chosen year is the year whose real GNP is to be estimated. The method of working out GNP deflator is given below.

$$\text{GNP Deflator} = \frac{\text{PIN of the chosen Year}}{100}$$

The formula for converting nominal GNP of a year into real GNP may be written as follows:

$$\text{Real GNP} = \frac{\text{Nominal GNP}}{\text{GNP Deflator}}$$

or

$$\text{Real GNP} = \frac{\text{Nominal GNP}}{\text{PIN}_{\text{cy}}/100}$$

where, PIN_{cy} is the price index number of the chosen year

For application of GNP deflator concept, let us consider an example. Suppose nominal GNP of a country, i.e., GNP estimated at current prices, in year 2012 is given at ₹ 500 billion and Price Index Number (PIN) is given as base year 2012 = 100. Now let the nominal GNP increase to ₹ 600 billion in year 2017 and PIN rises to 110. Given this data, GNP deflator for the country can be obtained as shown below.

$$\text{GNP Deflator} = \frac{\text{PIN (2017)}}{\text{PIN (2012)}} = \frac{110}{100} = 1.10$$

Given the GNP Deflator at 1.10, the Real GNP for the year 2017 can be worked out as follows:

$$\text{Real GNP (2017)} = \frac{\text{₹ 600 bn}}{1.10} = \text{₹ 545.45 billion}$$

Note that nominal GNP increases from ₹ 500 billion to ₹ 600 billion, i.e., by 20 per cent over a period of five years or at an annual average rate of 4 per cent. Since PIN increases from 100 to 110, i.e., by 10 per cent over a period of five years, real GNP increases at a lower rate, i.e., at 9.1 per cent [$= (545.45 - 500) 100/500$] or at an annual average rate of 1.8 per cent.

3.3.2 GNP Implicit Deflator

Another variant of *GNP* deflator is *GNP implicit deflator*, also called *implicit price deflator*. It is the ratio of nominal *GNP* to real *GNP*, i.e.,

$$\text{GNP Implicit Deflator} = \frac{\text{Nominal GNP}}{\text{Real GNP}}$$

The *GNP* implicit deflator can be used for the following purposes.

1. To construct price index number
2. To measure the rate of change in prices, i.e., to measure the rate of inflation or deflation

For instance, in our example, the nominal *GNP* in year 2012 is ₹ 500 billion and the real *GNP* is ₹ 545.45 billion. In that case,

$$\text{GNP Implicit Deflator} = \frac{\text{₹ 600.00 billion}}{\text{₹ 545.45 billion}} = 1.10$$

3.3.3 GNP Implicit Deflator and Price Index Number

The *GNP* Implicit Deflator multiplied by 100 give the **Price Index Number (PIN)** for the year 2012. That is,

$$\begin{aligned}\text{PIN}_{2012} &= \text{GNP Implicit Deflator} \times 100 \\ &= 1.10 \times 100 = 110\end{aligned}$$

Thus, 110 is the price index number for the year 2012. The same procedure can be adopted to calculate *PIN* for other years.

Once *PINs* for different years are calculated, the same can be used to calculate the rate of change in price, i.e., the rate of inflation or deflation. For example, the rate of inflation between the year 2012 and 2017 can be worked out as follows:

$$\begin{aligned}\text{Rate of Inflation} &= \frac{\text{PIN}_{2017} - \text{PIN}_{2012}}{\text{PIN}_{2012}} \times 100 \\ &= \frac{110 - 100}{100} \times 100 = 10 \text{ per cent}\end{aligned}$$

This means that inflation over a period of five years was 10 per cent or at an annual average rate of 2 per cent.

3.4 METHODS OF MEASURING NATIONAL INCOME

Given the important uses of national income estimates, estimating national income is an indispensable task of the government. However, estimating national income is an extremely complicated and gigantic task. The reason is that the process of income generation in a modern economy is extremely complex and, therefore, collecting necessary data on the different sources and levels of income is beset with conceptual and data availability problems. The economists have, however, devised different methods of estimating national income. The basic approach in measuring national income is to measure the two kinds of flows generated by the economic activities of the residents of the country. As we know from the circular flows of income, the income generating process creates two kinds of flows:

1. Product flows
2. Money flows

The money flows can be looked upon from two angles.

1. Money flows as factor payments
2. Money flows as payments for goods and services

Given the product flows and two ways of money flows, the economists have devised *three methods of measuring national income*.

1. Net Product Method or the Value Added Method
2. Factor Income Method
3. Expenditure Method

Any of the three methods can be adopted to measure *Gross Domestic Product (GDP)* of a country provided required data is fully available. In case a single method cannot be adopted due to nonavailability of the required data, or due to conceptual problems as to what should be and what should not be included in national income accounting, a combination of the three methods is used to measure *GDP*.

All these methods are, in fact, used to measure the gross domestic product (*GDP*). The estimated *GDP* is then adjusted for net income from abroad to

estimate *GNP*. The three methods of measuring *GDP* based on three approaches are briefly described here. The treatment of net income from abroad is discussed in the following section. The three methods of estimating *GDP* are described here briefly.

3.4.1 Net Product Method—The Value Added Method

The *net product method*, also called *the value added method*, consists of three stages: “(i) estimating the gross value of domestic output in the various branches of production; (ii) determining the cost of material and services used and also the depreciation of physical assets; and (iii) deducting these costs and depreciation from gross value to obtain the net value of domestic output...”⁶ The formula for measuring value of net product may be expressed as follows:

Net product value = Gross value of Domestic Product *less* cost of Production *less* Depreciation

The methods of estimating *gross value* and its *cost of production* and also the method of measuring *net product* are described here briefly.

Measuring Gross Value

For measuring the gross value of domestic products, the output of different industries are classified under various categories. The classification of products varies from country to country depending on (i) the nature of domestic industries, (ii) their significance in aggregate economic activities, and (iii) the availability of requisite data. For example, in the US, seventy-one divisions and sub-divisions were sometime ago used to classify the national output; in Netherlands the classification ranges from a dozen to a score; and only half-a-dozen classifications were used in Russia. According to the Central Statistical Organisation (CSO) publications, twenty-one sub-categories of products are currently used in India.

After classifying the output in appropriate categories, the gross value of output of each category is computed by any of the following two alternative methods:

Method 1 By multiplying the output of each category or sector by their respective market prices and adding them together
Method 2 By collecting the data on gross sales and inventories from the records of the companies and adding them up
If there are gaps in the data, necessary adjustments in estimates are made.

Estimating Cost of Production

The next step in estimating the net national product is to estimate the intermediate cost of production including depreciation. Estimating the cost of production is often a complicated task because of non-availability of necessary cost data. Much more difficult is the task of estimating depreciation as it involves both conceptual and statistical problems. For this reason, many countries adopt factor income method for estimating their national income.

However, countries adopting net product method find some ways and means to compute the deductible costs. The costs are computed either in absolute terms (where input data are adequately available) or as an overall input-output ratio. For estimating depreciation, the general practice is to adopt the practice followed by the business firms in general. Conventionally, however, depreciation is estimated at some percentage of original cost of capital, permissible under the taxation laws. In some countries, it is estimated at some percentage of total output rather than as percentage of cost of capital.

Measuring Net Product

Once intermediate cost and depreciation are estimated by a suitable method, these costs are deducted from the estimated *sectoral gross output* to arrive at *net sectoral product*, i.e., sectoral *NNP*. The *NNP* of different sectors of the economy are then added together to arrive at the aggregate *NNP*.

Value Added Method

The product method, described above, can be understood better through the ***value added method*** of estimating national income. In the net product method, a serious problem is often confronted, i.e., the problem of **double counting**.

counting of the same product. Value added method is used to avoid *double counting*, i.e., counting the value of a commodity more than once.

To understand the problem of double counting, recall the definition of national income (*GDP*). National income is defined as the money value of all *final* goods and services produced in a given period of time. The problem of double counting arises because of the conceptual and practical problem in determining whether a product is final or intermediate. This problem arises because in the process of production, some material products pass from one stage to another. But, at each stage of production, it is transformed into a final product. However, the same final product is used as material input at the next stage in the production process of another commodity. Therefore, the value of the same product is likely to be counted twice, or more than twice, in estimating national income. For example, wheat is the final product for the farmer, Kisanchand. But wheat is an input (raw material) for a flour mill, say, Shaktibhog Atta. Wheat flour is the final product for Shaktibhog Atta company. But wheat flour is used by the bread manufacturer, Britannia Bread Company, as raw material. For Britannia, bread is the final product. But bread is an input for sandwich-maker, the Tastyfood Restaurant. Now, if all these products—wheat, wheat flour, bread and sandwich—are treated as final products, then the value of wheat is counted at four stages—wheat production, flour production, bread production and sandwich production. This is called *double counting* in national accounting jargon. Double counting results in overestimation of national income. Therefore, in order to avoid the problem of double counting, a method called **value added method** is used to estimate the national income.

The method of calculating *value added* to a product (wheat flour) can be illustrated as shown in Table 3.2. Suppose Shaktibhog Flour Mill buys one quintal wheat for ₹ 1000 and sells the flour to bread manufacturing company, Britannia, at ₹ 1500. This means that Shaktibhog has added a value of ₹ 500 to the wheat. Let us suppose that value addition includes the cost components as given below.

Table 3.2 Value Addition by Flour Mill (per quintal)

Cost of Wheat (Intermediate Input)	₹	1000
Transportation cost	₹	1000
Labour charge	₹	50
Electricity charge	₹	150
Storage cost	₹	100
Depreciation	₹	50
Profit margin	₹	50
Sale price	₹	100
<i>Less cost of wheat (raw material)</i>	₹	1500
Value added	₹	1000

For the purpose of estimating national income, the valuation process related to the final product, sandwich, is illustrated in Table 3.3.

Table 3.3 Method of Measuring Value Added

(₹ per quintal)			
Product	Value of Inputs	Value of Final Output	Gross Value Added (3-2)
1	2	3	4
Wheat	500	1000	500
Flour	1000	1500	500
Bread	1500	2000	500
Sandwich	2000	3000	1000
Total	4500	7500	2500

As the table shows, the gross value added in case of sandwich production is estimated at ₹ 2500 per quintal. This per quintal value multiplied by total production of sandwiches gives the total value of the final product, the sandwiches.

This method avoids counting value of wheat, a material input, more than once. The same method of value added is followed for each enterprise producing goods and services within the territory of a country. For the purpose of estimating value added, the following steps are generally followed:

1. Identifying the production units and classifying them under different industrial activities

2. Estimating net value added by each production unit in each industrial sector
3. Adding up the total value added of each final product to arrive at *GDP*

3.4.2 Factor Income Method

The factor income method is also known as *factor share method*. In this method, the national income is treated to be equal to all the "incomes accruing to the basic factors of production used in producing the national products." The factors of production are traditionally categorised as land, labour, capital and entrepreneurship. Accordingly, the national income is treated as the sum of factor payments, viz., rent, wages, interest, and profits, respectively, plus depreciation. Thus,

$$\text{National Income (GDP)} = \text{Rent} + \text{Wages} + \text{Interest} + \text{Profit} + \\ \text{Depreciation}$$

In a modern economy, however, it is conceptually very difficult to distinguish between earnings from land and capital and between the earnings of ordinary labour and entrepreneurial efforts. For the purpose of estimating national income, therefore, factors of production are broadly grouped as labour and capital. Accordingly, the national income is supposed to originate from two primary factors—labour and capital. In some productive activities, however, labour and capital are jointly supplied by the same person and it is very difficult to separate the labour and capital income contents from the total earning of the supplier. Such incomes are, therefore, termed as *mixed incomes*. Thus, the national income is considered to be comprised of three components : (i) labour incomes, (ii) capital incomes, and (iii) mixed incomes. These factor incomes have some specific connotation as discussed below.

Labour Incomes

Labour incomes include: (i) wages and salaries (including commission bonus and social security payments) paid to the residents of the country; (ii) supplementary labour incomes including employer's contribution to social security and employee's welfare funds and direct pension payments to

retired employees⁷; and (iii) supplementary labour incomes *paid in kind*, for example, free-of-cost provision for health care, education, food, clothing, accommodation, and servant facility, called perks.

Transfer payments like old age pensions, service grants, compensation to war-affected people, etc., are not included in labour incomes and labour incomes from incidental jobs, gratuities, tips, and so forth are ignored for lack of the data.

Capital Incomes

According to Studenski⁸, capital incomes include: (i) dividends excluding inter-corporate dividends, (ii) undistributed before-tax profits of corporations, (iii) interest on bonds, mortgages and saving deposits (but not on war bonds and consumer credits), (iv) interest earned by insurance companies and credited to the insurance policy reserves, (v) net interest paid out by commercial banks, (vi) net rents from land and building, including imputed net rents on the owner occupied dwellings, (vii) royalties, and (viii) profit of the government enterprises.

The data for the first two items are obtained mostly from the books of accounts submitted by the corporations to the tax authorities for tax assessment purpose. Incidentally, the definition of profit used for national accounting purposes differs from one used by the tax authorities. Some adjustment in data, that is, some additions and some deductions, are made in the assessment of profits in regard to (i) the excessive allowance of depreciation, if any, made by the tax authorities, (ii) elimination of capital gains and losses because these items do not reflect the change in the current output; and (iii) elimination of under- or overvaluation of inventories on book values.

Mixed Incomes

Mixed incomes include earnings from: (i) farming enterprises, (ii) sole proprietorship (not included under profit and capital incomes), (iii) other professions, including legal and medical practices, consultancy services trading and transportation, and (iv) mixed incomes of those who earn their

living from various sources, including wages, rent on own property, interest on own capital and so forth.

All the three kinds of incomes, viz., labour incomes, capital incomes, and mixed incomes, are added together to obtain the estimate of the national income by **factor-income method**.

3.4.3 Expenditure Method

The expenditure method, also known as the **final product method**, measures national income at the final expenditure stage. In order to estimate the aggregate expenditure, any of the following two methods may be followed:

Income Disposal Method

Under this method, all the money expenditures at market prices are added up together to obtain the total final expenditure. Under the **income disposal method**, the items of expenditure that are taken into account are:

- Private consumption expenditure
- Direct tax payments
- Payments made to the non-profit institutions and charitable institutions like schools, hospitals, orphanage, etc.
- Private savings (or investments)

Product Disposal Method

Under this method, the value of the products finally disposed of are computed and added together. This gives a measure of the total final expenditure and, hence, a measure of the national income by expenditure method. Under the **product disposal method**, the following items of expenditure are included:

- Private consumer goods and services
- Private investment goods
- Public goods and services
- Net investment abroad

The product disposal methods is far more extensively used compared to the first method because the data required by the second method can be collected with greater ease and accuracy.

3.4.4 Treatment of Net Income from Abroad

As mentioned above, the three methods of estimating national income give the measure of *GDP* of a closed economy. In reality, however, most modern economies are, 'open economies' in the sense that they have trade relations and other kinds of economic transactions with the rest of the world. In the process, some countries make net gains and some net losses. The net gains are, in fact, additions to the national income and net losses cause deduction from the national income. Therefore, in estimating the national income, net incomes from abroad are added to *GDP* and net losses are subtracted from *GDP* to arrive at the national income figure of an open economy. It is important to note here that *GDP* adjusted for net income from abroad is called Gross National Income (*GNI*).

In practice, all the exports of merchandise and services like shipping, insurance, banking, tourism and gifts are added to the national income. All the imports of goods and services like shipping, insurance, banking, tourism and gifts are subtracted from the national income. The final outcome of these adjustment is a measure of the national income (*GNP*).

3.4.5 Double Entry System of Accounting

Another method which is often used in national income accounting is *double entry of book keeping system*. National income accounting is a systematic recording of all economic transactions carried out by different sections of the society and the resulting output. Economic transactions involve at least two 'transactors': one who pays and the one who receives. Note that in the process of earning and spending, each person works as a payer as well as a receiver. A person receives money when he or she sells a product or service and he or she pays the money when he or she buys a product or service. So each person can be allocated an account containing two sides – credit and debit. What money a person receives, he or she is recorded on the 'credit' side and what he or she pays money is recorded on

the 'debit' side of the account. Thus, a double entry accounting system is one in which both receipts and payments are recorded—receipts on credit side and payments on debit side of the account.

Another aspect of the double entry accounting system is that the account of a person need not to be in balance. A person may spend less than what he or she receives. Then he or she has a saving. The savings are recorded on the debit side to balance the account. Under double accounting system, account of each person is always in balance, as it is done in double entry book-keeping system of business accounting. Similarly, if a person spends more than what he or she receives, he or she has a debit balance. His or her debit is recorded on the credit side as borrowings and his or her account is balanced. In overall accounting, the sum of savings is equal to the sum of borrowings.

In double entry accounting system, many types of accounts can be imagined and operated. Accounts may be based on individual transactors or on the basis of sectoral transactions—consumption and investment. In national income accounting system, the main types of transactions and their accounting include the following:

1. Private consumption
2. Government consumption
3. Investment (savings converted into capital)
4. Government taxes and spending
5. Inventories
6. Net of foreign transactions (exports and imports)

These sectoral transactions can be shown as the circular flows of incomes and can be converted into equations. For instance, refer to the circular flows of income in two-sector model in Ch. 2. From the two-sector model of circular flows of incomes, the following equations can be derived:

$$Y = C + I = C + S$$

where, Y = national income; C = consumption expenditure by households; I = capital spending by firms; and S = savings by households

In the *three-sector model*, the national income equation is given as follows:

$$Y = C + I + G = C + S + T$$

where, G = Government spending, and T = tax revenue of the government.
In four-sector model of circular flows, the equation takes the following form:

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

where, X = exports and M = imports

We have described above the method of estimating national income used in India. Let us now look at India's national income estimates and trends.

3.5 MEASUREMENT OF NATIONAL INCOME IN INDIA

Before we discuss the method of measuring national income in India, let us have a glance at the history of measurement of national income in the country.

3.5.1 History of National Income Measurement in India

The history of measurement of national income in India can be divided under two phases: (i) pre-Independence phase, and (ii) post-Independence phase. In the **pre-independence phase**, the first attempt ever to measure national income of India was made by Dadabhai Naoroji⁹ in 1867–68. Subsequently, several attempts were made by the economists and government officials to estimate India's national income¹⁰. Most of these estimates had their own methodological and data limitations and, therefore, had doubtful reliability. The first systematic attempt to estimate India's national income was made by Prof. V.K.R.V. Rao for the year 1925–29 and again for the year 1931–32. The estimate of national income made by Prof. Rao is considered to be superior in many respects. By 1949, some other agencies had also estimated India's national income. But all these estimates had serious limitations.

11. Personal Disposable Income or
Disposable Income

- (or Undistributed Corporate Profits) – Corporation Tax (or Profit Taxes)
- = 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.

SOLVED PROBLEMS

1 From the data pertaining to the Indian Economy given below, calculate (a) GNP at Factor Cost, (b) NNP at Factor Cost, (c) Net Domestic Product at Factor Cost, and (d) Net Domestic Product at market Prices.

	Rs. Crores
i) GNP at Market Prices	97503
ii) Net factor income from abroad	(-) 201
iii) Capital consumption allowance	5699
iv) Net indirect taxes	10576

GNP at Market Prices	=	97503
GNP at Factor Cost	=	GNP at Market Prices – Indirect Taxes
	=	97503 – 10576 = 86927
NNP at Factor Cost	=	GNP at Factor Cost – Depreciation
	=	86927 – 5699 = 81228
NDP at Factor Cost	=	NNP at Factor Cost – Net Factor Income from abroad
NDP at Market Prices	=	NDP at Factor Cost + Indirect Taxes
	=	81228 + 10576 = 92005

In the basis of the following information relating to the Indian Economy, estimate (a) GNP at market Prices, (b) Private Income, (c) Personal Income, and (d) Personal disposable Income.

	Rs. Crores
i) Net domestic product at factor cost	81429
ii) Income from domestic product accruing	

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to the Government sector	2333
(iii) Net factor income from abroad	(-) 201
(iv) Indirect Taxes	12876
(v) Subsidies	2300
(vi) Interest on national debt	964
(vii) Transfers from Government administrative departments	1981
(viii) Other current transfers from the rest of the world	1271
(ix) Corporation tax	1251
(x) Undistributed corporate profits	464
(xi) Direct taxes paid by households	2100
(xii) Consumption of fixed capital	5699

solution

(a) GNP at Market Prices = Net Domestic Product at Factor Cost + Net Factor Income from abroad + Capital Consumption Allowance (or Consumption of Fixed Capital) + Indirect Taxes – Subsidies
 $= 81429 + (-201) + 5699 + 12876 - 2300 = 97503$

(b) Private Income = NNP at Factor Cost (or NI) + Transfer Payments + Interest on Public Dept – Social Security Contributions – Income from Government Departments – Profits and Surpluses of Public Corporations.

First, calculate NNP at Factor Cost because NDP at Factor Cost is given in the illustration. So
 $NNP \text{ at Factor Cost} = NDP \text{ at Factor cost} + \text{Net Factor Income from abroad} = 81429 + (-201)$
 $= 81228$

Now Private Income = $81228 + 1981 + 1271 + 964 - 2333 = 83111$
 where Transfer Payments from Government

Administrative Departments	= 1981
Other current transfers from the rest of the world	= 1271
Interest on National Debt	= 964
Income from Government Departments	= 2333

The remaining items in the equation are not given in our example.
 Note : Items (vii) and (viii) relate to Transfer Payments.

(c) Personal Income = Private income – Undistributed Corporate Profit (or Savings of Private Corporate Sector) – Corporation Tax
 $= 83111 - 464 - 1251$
 $= 81396$

(d) Personal Disposable Income = Personal Income – Direct Taxes paid by Households
 $= 81396 - 2100$
 $= 79296$

3. On the basis of the following information, calculate Net National Product at Market Prices and Disposable Personal Income :

	Rs. Crores
(i) Net domestic product at factor cost	15480
(ii) Income from domestic product accruing to government	140
(iii) National debt interest	170
(iv) Transfer payments by government	240
(v) Net private donations from abroad	30
(vi) Net earned income from abroad	80
(vii) Indirect taxes	1330
(viii) Direct taxes	33
(ix) Subsidies	10
(x) Taxes on corporate profits	22
(xi) Undistributed profits of corporations	10

Solution

First calculate NNP at Factor Cost because NDP at Factor Cost is given in the illustration.

NDP at Factor Cost	=	15480
- Net earned income from abroad	=	80
∴ NNP at Factor Cost	=	<u>15560</u>
NNP at Market Prices	=	15560
NNP at Factor Cost	=	1330
+ Indirect Taxes	=	- 100
- Subsidies	=	<u>16790</u>
∴ NNP at Market Prices	=	

To Calculate Disposable Personal Income, calculate Private income and Personal Income.

Private Income		
NNP at Factor Cost	=	15560
+ Transfer Payments by Government	=	240
+ Net private donations from abroad	=	30
(These are transfers from the rest of the world)	=	170
+ National debt interest	=	
- Income from domestic product accruing to government	=	140
∴ Private Income	=	<u>15860</u>

Personal Income		15860
Private Income		- 222
- Taxes on corporate profits		105
- Undistributed profits of corporations		<u>15533</u>

∴ Personal Income

Disposable Personal Income

Private Income	=	15533
- Direct Taxes on persons	=	-335
Disposable Personal Income	=	<u>15198</u>

EXERCISES

ME

Examples on NI unit.

Q1. Given:

GNP at factor cost	= 1,50,000
Depreciation	= 8,000
NFIA	= 4,000
Subsidies	= 2,700
Indirect Tax	= 16,000
Personal Income	= 50,000
National Income	= 70,000
Disposable Income	= 45,000

- Find (i) Personal Income Tax =
(ii) Retained Profits
(iii) NNP at market price

Solution: (i) $PIT = PI - PDI \quad 50,000 - 45,000 = 5,000$

(ii) $\text{Retained Profits} = NI - PI \quad 70,000 - 50,000 = 20,000 \text{ Indirect}$

(iii) $\text{NNP at market price} = [\text{GNP at factor cost} - \text{Depreciation}] + \text{Income Tax} - \text{Subsidies}$
 $[1,50,000 - 8,000] + 16,000 - 2,700$
 $= 1,55,300$

Q2. Calculate:

- (i) National income;
(ii) Personal Income; and
(iii) GDP at factor cost; on the basis of the given information:

Sl. No.	Particulars	Amount [Rs. Crores]
1.	Subsidies	400
2.	Undistributed Profits	200
3.	GNP at market price	4100
4.	Depreciation	250
5.	Indirect Tax	450
6.	Pension	350
7.	NFIA	200

Solution: (i) $NI = \text{GNP at factor cost} - \text{PDI} \quad 4100 - 400 = 3700$

Indirect

$\text{NNP at market price} = \text{NNP at market price} + \text{subsidies} - \text{Income Tax} \quad 3700 + 400 - 450 = 3850$

$\text{NNP at market price} = \text{GNP at market price} - \text{Depreciation} \quad 3850$

(ii) $PI = NI - \text{Indirect Tax} + \text{Pension} \quad 3850 - 450 + 350 = 3750$

(iii) $GDP at factor cost = NI + \text{Depreciation} + \text{NFIA}$

$3850 + 250 + 200 = 4300$

$= 3850$

Calculate:

- NNP at market price;
- GNP at market price; and
- NNP at factor cost; on the basis of the given information:

Sr. No.	Particulars	Amount [Rs. Crores]
1	NFIA	7432
1	NDP at market price	127000
2	Subsidies	2700
3	Indirect Tax	16022
4	Depreciation	7400
5		

(i) NNP at market price = NDP at market price + NFIA $1,27,000 + 7432 = 1,34,432$
 (ii) GNP at market price = NNP at market price + Depreciation $1,34,432 + 7400 = 1,41,832$
 (iii) NNP at factor cost = NNP at market price + Subsidies - Indirect Tax $- 1,41,832 = 1,21,110$

On the basis of the given information, answer the questions stated below.

Particulars	Amount (Rs.)
GNP at market price	4,000
Subsidies	300
Undistributed Profit	100
Indirect Taxes	350
Depreciation	150
Personal Income Tax	500
Factor Income Paid Abroad	600
Factor Income Earned Abroad	700
Transfer Payment	250

Find:

- GDP at factor cost
- National Income
- Personal Income
- Personal Disposable Income

(i) GDP at Factor Cost = GNP at market price - IT + Subsidies - NFIA
 $= \text{Rs. } 3850$

(ii) NI = GDP at factor cost - Direct taxes + NFIA = Rs. 3800

(iii) PI = NI + DI - Personal taxes = Rs. 3950

(iv) PDI = PI - Personal Disposable taxes = Rs. 3450

Q5. On the basis of the given information, answer the questions stated below.

Particulars	Amount (Rs.)
NDP at market price	1,27,029.00
Net Factor Income Abroad	-349.50
Depreciation	7,435.50
Indirect Tax	1,6033.50
Subsidies	2,658.00

Find:

- (i) NNP at market price
 - (ii) GNP at market price
 - (iii) NDP at factor cost
- = $NDP \text{ at MP} + NFA$
= $NNP \text{ at MP} + \text{Dep}$
= $NDP \text{ at MP} + \text{Sub} - IT$

Solution:

- (i) NNP at market price = Rs. 126679.50
- (ii) GNP at market price = Rs. 134115.00
- (iii) NDP at factor cost = Rs. 113653.50

Q6. If $Y = \text{Rs. } 5500$ and $\text{APS} = 0.3$, find out APC. Also, find out the changes in consumption if $\text{MPC} = 0.4$ and income increases by Rs. 1000.

Q7.

If an amount of Rs. 4000 crores is deposited in a bank and r is 5%, find out:

- (i) Deposit Multiplier
- (ii) Total and Derivative Deposits
- (iii) Show the working till the fourth stage

Fundamentals of Macro Economics
Unit 1: National Income Numerical

Calculate Personal disposable income (PDI) from the following data.

		(₹ in crores)
(i)	Personal taxes	60
(ii)	NNP at FC accruing to private sector	600
(iii)	Undistributed profit	10
(iv)	National debt interest	50
(v)	Corporation tax	100
(vi)	Net current transfers from ROW	- 20
(vii)	Current transfers from government	30

$$PDI = 600 - 10 - 100 + 50 + (-20) + 30 - 60 = 490 \text{ crores.}$$

Find out private income from the following data:

	(₹ in crores)
(i) Income from domestic product accruing to private sector	254
(ii) Net current transfer paid to rest of world	4
(iii) Net current transfer from Govt, administrative dept.	10
(iv) National debt interest	10
(v) Net factor income from abroad	-3

$$\text{Private income} = (i) + (iii) + (iv) + (v) - (ii)$$

$$= 254 + 10 + 10 + (-3) - 4$$

$$= 267 \text{ crores}$$

Calculate personal disposable income:

	₹
Private Income	2,000
Income accruing to corporations	500
Personal income tax	100
Dividend	50
Miscellaneous receipts of Govt, administrative dept.	50

$$\text{Personal income} = 2,000 - 500 + 50 \text{ (dividend)} = 1,550$$

$$\text{Personal disposable income} = 1,550 - 100 - 50 = 1,400$$

From the following data, calculate Private Income.

(₹ in crores)

(i) Income from domestic product accruing to private sector	4000
(ii) Savings of non-departmental public enterprises.	200
(iii) Current transfers from Govt, administrative deptt.	150
(iv) Savings of private sector	400
(v) Current transfers from rest of the world	50
(vi) Net factor income from abroad	-40
(vii) Corporation tax	60
(viii) Direct personal taxes	140

$$\text{Private income} = (i) + (iii) + (v) + (vi)$$

$$= 4000 + 150 + 50 + (-40)$$

$$= 4160 \text{ crores}$$

Calculate personal income:

		(₹ in crores)
(i)	Retained earnings of private corporations	20
(ii)	Miscellaneous receipts of govt, administrative deptt.	50
(iii)	Personal disposable income	200
(iv)	Personal tax	30
(v)	Corporate profit tax	10

$$\text{Personal income} = (iii) + (iv) + (ii)$$

$$= 200 + 30 + 50 = 280 \text{ crores}$$

Calculate private income.

	(₹ in crores)
(i) National debt interest	10
(ii) Personal disposable income	150
(iii) Personal taxes	50
(iv) Corporate profit tax	25
(v) Retained earnings of private corporations	5

$$\text{Private income} = (ii) + (iii) + (iv) + (v)$$

$$= 150 + 50 + 25 + 5$$

$$= 230 \text{ crores}$$

Calculate personal income from the following data:

	(₹ in crores)
1. Net national product (National income)	54,500
2. Corporate profit tax	1,520
3. Undistributed profits of companies	3,500
4. Share of National Income accruing to government sector	1,680
5. Interest on National Debt	700
6. Current Transfer	
(i) from Government	1,200
(ii) from rest of the world	300
7. Personal Income Tax	250

$$\begin{aligned}\text{Personal income} &= (1) - (4) - (2) - (3) + (5) + (6) \\ &= 54,500 - 1,680 - 1,520 - 3,500 + 700 + (1,200 + 300) \\ &= 54,500 - 6,700 + 2,200 \\ &= 50,000 \text{ crores}\end{aligned}$$

Find out personal income from the following data:

	(₹ in crores)
1. Income from domestic product accruing to private sector	224
2. Net current transfers from rest of the world	3
3. Net current transfers from Govt.	9
4. National debt interest	8
5. Undistributed profit	1
6. Corporation tax	3

$$\begin{aligned}\text{Personal income} &= (1) + (2) + (3) + (4) - (5) - (6) \\ &= 224 + 3 + 9 + 8 - 1 - 3 = 240 \text{ crores}\end{aligned}$$

Calculate 'private income' from the following data:

	(₹ in crores)
(i) National debt interest	30
(ii) Gross national product at MP	400
(iii) Current transfers from government	20
(iv) Net indirect taxes	40
(v) Net current transfers from rest of the world	(-) 10
(vi) Net domestic product at FC accruing to government	50
(vii) Consumption of fixed capital	70

$$\begin{aligned}\text{Private income} &= \text{GNP at MP} - (\text{vi}) + 30 + 20 + (-10) - 40 - 70 \\ &= 400 - 50 + 30 + 20 - 10 - 40 - 70 = 280 \text{ crores}\end{aligned}$$

Calculate (a) Private income, and (b) Personal Disposable Income (PDI) from the following data
 (₹ in crores)

(i) Savings of private corporate sector	500
(ii) Savings of non-departmental public enterprises	200
(iii) Capital transfers from rest of the world	50
(iv) Current transfers from govt. administrative departments	100
(v) Corporation tax	150
(vi) Income from domestic product accruing to private sector	3500
(vii) Net indirect taxes	300
(viii) Net factor income from abroad	(-) 30
(ix) Current transfers from rest of the world	40
(x) Direct personal taxes	110

$$(a) \text{Private income} = \text{Private sector income} + \text{NFIA} + \text{All transfers}$$

$$= 3500 + (-30) + (40 + 100) = 3610 \text{ crores}$$

$$(b) \text{PDI} = \text{Private Income} - \text{Corporation tax} - \text{Savings of corporate sector} - \text{Personal taxes}$$

$$= 3610 - 150 - 500 - 110$$

$$= 2850 \text{ crores}$$

Calculate (a) Private income, and (b) Personal disposable income from the following data:
 (₹ in crores)

(i) Income from property and entrepreneurship to govt. adm. deptt.	500
(ii) Savings of non-departmental public enterprises.	100
(iii) Corporation tax	80
(iv) Income from domestic product accruing to private sector	4500
(v) Current transfers from govt. administrative departments	200
(vi) Net factor income from abroad	-50
(vii) Direct personal taxes	150
(viii) Indirect tax	220
(ix) Current transfers from rest of world	80
(x) Savings of private corporate sector	500

$$(a) \text{Private income} = (iv) + (v) + (vi) + (ix)$$

$$= 4,500 + 200 + (-50) + 80 = 4,730 \text{ crores}$$

$$(b) \text{PDI} = 4,730 \text{ (Private income)} - 80 - 150 - 500 = 4,000 \text{ crores.}$$

Chapter 2

Macroeconomic Issues, Concepts and Model Building

INTRODUCTION

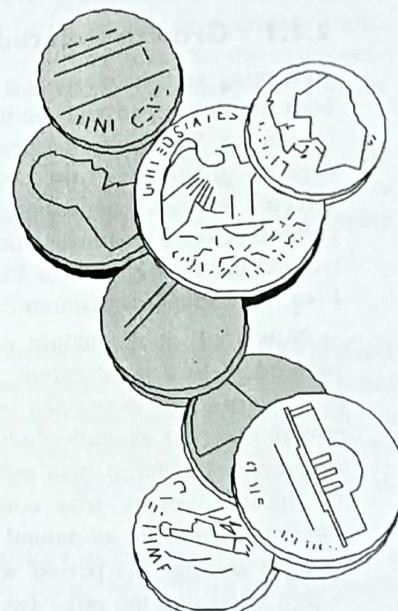
In Chapter 1, we introduced macroeconomics. The objective of this Chapter is to present macroeconomics in perspective, i.e., to give a broader view of the subject matter and the method of analysis, prior to commencing the study of macroeconomic theories. The main aspects highlighted here include:

- (i) **Macroeconomic issues**—The macroeconomic issues are the economic problems that have often been confronted by different countries at different points of time;
- (ii) **Macroeconomic concepts**—The analytical concepts that are used in macroeconomic studies;
- (iii) **Macroeconomic model building**—Construction of a framework for analysing macroeconomic phenomena.

2.1 MACROECONOMIC ISSUES

In the preceding section, we described briefly what macroeconomics is about and gave its broad definition. However, the central theme and the subject matter of macroeconomics can be comprehended better by looking at the **macroeconomic issues**, or the **problems** that most countries have faced over time and have been the cause of concern for the macroeconomists and the government policy makers. The following are the main macroeconomic issues.

1. Achieving and maintaining a high rate of economic growth,
2. Preventing business cycles when symptoms come up,



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3. Controlling inflation and stabilising price level,
4. Solving the problems of unemployment and poverty,
5. Containing growing budgetary deficits, and
6. Managing international economic issues.

These macroeconomic problems continue to plague most of the countries, and continue to remain a major concern for the policy makers of the country. In spite of spectacular growth of theories, thoughts, tools and techniques of macroeconomic management, the world economy is currently facing global recession. In this section, we discuss briefly the nature and magnitude of these macroeconomic problems which continue to remain the major concern of both the policy makers and the macroeconomists.

2.1.1 Growth Related Issues

Achieving and maintaining a high rate of economic growth has been a matter of great concern for both the developed and the underdeveloped countries, especially after the Second World War. The reason, as Samuelson has pointed out is, "The political, social, and military fate of the nation depends greatly upon their economic success"¹. After the Second World War, therefore, the war affected nations concentrated on reconstruction of their war-devastated economies, and most underdeveloped countries started formulating and implementing development plans. India implemented her First Five Year Plan of economic development in 1951 and continues with the Eleventh Five Year Plan for economic development.

Now look at the nature of the *growth related issues*. While industrially advanced countries succeeded, to a great extent, in achieving and maintaining a fairly high growth rate (4-6 percent per annum), less developed countries (LDCs) continued to strive for long to achieve a reasonable growth rate. For example, India had planned to achieve a growth rate of 5 percent but could achieve an average annual growth rate of 3.5 percent over a period of 25 years—from 1951 to 1975. So the question arises: why could target growth rate not be achieved? Besides, while the Indian economy registered an annual growth rate of 3.5 percent during 1951-75, growth rate in China and Pakistan during this period was much higher (5-6 percent). It has been generally observed that though India and the other two countries made similar efforts to achieve a high growth rate, China and Pakistan succeeded in achieving it, India failed. So the issue arises: Why do some countries grow at a high rate and some countries at low rate, their growth efforts being the same?

Also, look at the growth problems that DCs and LDCs faced during the period from 1950 to mid-1970s. The major problem that DCs faced was how to maintain the high growth which had started showing signs of decline. On the other hand, LDCs faced the problems of how to accelerate the pace of their growth rate, how to generate adequate savings from the low level of income, how to increase the rate of capital formation, how to promote investment opportunities, and so on.

Since the mid-1980s, however, the nature of *growth related issues* faced by the DCs and LDCs have changed, rather reversed. Look at the changing nature of dilemma being faced by DCs and LDCs. Many LDCs, especially India and China—now referred to as *fast developing countries*—have succeeded in achieving a very high growth rate—India 9 percent and China 11 percent. India is predicted to be the world economic power by 2020, so fast is the growth rate of the Indian economy.

¹ Samuelson, P. A., *Economics*, 1989, p.76.

economy. But the main macroeconomic issues that countries like India and China are currently faced with are:

- (i) How to maintain the current high growth rate;
- (ii) How to prevent the overheating of the economy—a problem often associated with fast growing economies; and
- (iii) How to keep inflation under control within its tolerable and desirable limits.

On the other hand, growth rate in *developed countries* has come down to 2-3 percent per annum; investment opportunities have reduced drastically; their financial capital is flowing out to countries like India and China in the form of FDI and FII. Countries like US and Japan are currently facing recession. While US growth rate has come down to around 2 percent, growth rate in Japan declined to 1.3 percent during 2000-05². Both the countries are currently facing strong recessionary trend. Besides, there are indications of growing unemployment in developed countries. So the macroeconomic issues facing the developed countries are: (i) how to combat the recessionary trend in the economy, and (ii) how to accelerate the growth rate.

To conclude, achieving and maintaining a sustainable growth rate has for long been, and continues to be, one of the *main macroeconomic issues*. The growth related issues are becoming more and more complex with the rapid globalisation of the world economy and the consequent growing complexities.

2.1.2 The Issue of Business Cycles

Business cycle refers to high magnitude of fluctuation in the economy—high growth in GDP/GNP in one period followed by a sharp decline in the next period. Thus, business cycle is also referred to as the period of economic boom and depression. During boom and prosperity, there is high rate of growth in GDP and high rate of employment, and during depression, there is fast decline in GDP and high rate of unemployment. The recurrence of this kind of growth and depression in the economy is called *business cycle*.

The economic history of the world economy is, in fact, the history of business cycles—ups and downs, booms and slumps, prosperity and depression. Business cycle, like the Great Depression of 1930s, has not repeated itself over a period of 75 years. It is, perhaps, for this reason that some economists hold the view that ‘business cycle is obsolete’ or ‘business cycle is the thing of past’. The current global recession has proved them wrong. The global recession of 2008-09 is second only to the Great Depression of 1930s. Besides, business cycles of moderate magnitude continue to take place in modern times in most countries. For instance, “There have been three major recessions in the United Kingdom during the past four decades (1973-75, 1979-81, and 1990-92), and most major countries have experienced a similar pattern”³. One can find many such cases. If business cycles of high magnitude have not taken place frequently, it is mainly because economists have devised policy measures to control the business cycle, and governments have used suitable economic policy measures, especially monetary and fiscal policies, to control the factors causing fluctuations in the economy.

² The World Bank Report 2007, *Development and Next Generation*, Table 4, p. 294...

³ Richard G. Lipsey and Alec Chrystal, *Economics* (Oxford University Press, 11th Ed. Indian Edition, 2007), p.333.

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Nevertheless, the fact remains that factors and forces that cause a business cycle are always present in the growing economies. For instance, during the 1980s, some East Asian Economies, often referred to as 'Newly Industrial Countries (NICs)' and 'Asian Tigers' had achieved a very high growth rate. But, after a decade of high growth, these economies became so overheated that a situation of economic collapse had become imminent. The emerging conditions might have led to depression had the governments not adopted economic policies to control the downtrend.

Let us look at some other country-cases to understand the nature of the problem. Until the 1990s, the US economy had continued to grow at a fairly high rate, but its growth rate declined thereafter. The US economy is currently facing a strong economic recession. The Indian economy has also faced economic ups and downs over the past 40 years. If one looks at the annual average growth rate of real GNP in the Indian economy, one finds that India had a negative growth rate in 1964-65 (-3.7 percent) and 1979-80 (-5 percent), and a very low growth rate in 1991-92 (1.1 percent). These, however, constitute short-run decline in growth rate below the normal rate of around 5 percent. The downslide of the economy remained short term mainly because of the government adopting measures to prevent a big and prolonged downfall in the economy. The Indian economy attained a growth rate of 9.0 percent in 2007-08, which declined to about 7 percent in the last quarter of 2008. On the one hand, the Indian economy is predicted to emerge as the world economic power by 2020, while on the other, suspicions are being raised about a reasonably high growth rate in the economy in the coming years.

In brief, the fact remains that the forces of business cycles are always present in growing economies, and the government and the policy makers of the country have to be on their guards at the first indication of downslide in the economy and take action, if necessary, for preventing the business cycles. To quote Burns, "[The] men who wish to serve the democracy faithfully must recognise that roots of business cycles go deep in our economic organisations, that the ability of government to control depressions adequately is not yet assured, that our power of forecasting is limited, and that true foresight requires policies for coping with numerous contingencies". Burn's statement implies that business cycles remain a major macroeconomic issue. Although the issue of business cycle has been put on the back burner by the macroeconomists at higher theoretical level at practical level, it continues to remain an important issue. It is gaining more attention due to globalisation of the economy and its effects.

2.1.3 The Issue of Inflation

Inflation is another and equally important macroeconomic problem faced by the countries at different points of time, especially by the fast growing economies. **Inflation** is defined as persistent and considerable increase in the price level over a long period of time. A moderate rate of inflation is considered to be desirable for the economy—2-3 percent for developed countries and 4-5 percent for developing economies. But the annual rate of inflation has hardly ever been confined to these limits in DCs and LDCs. Inflation in excess of these rates is economically and also socially undesirable, and is rather dangerous for the economy. Historical time series data on price level show that inflation has been off and on affecting almost all countries. Look at the annual inflation rate in some countries (Table 2.1) based on the data published by the World Bank. In November 2007, inflation rate in Eurozone was reported⁴ to have hit 6-year high at 3.1 percent, as compared to the earlier rate of around

⁴ Business Standard, 17/11/2007

2 percent. Though this rate is comparatively lower, it has become a matter of great concern for the European Central Bank. In some countries, the rate of inflation has been unimaginably high in modern times. For instance, in Zimbabwe, inflation rate had shot up to 8,000 percent in September 2007, caused mainly by rise food and fuel prices, causing economic collapse in the country. The IMF had forecast inflation rate for Zimbabwe to hit 100,000 percent by the end of the year⁵. In order to meet the 'cash crisis' in the country, the government of Zimbabwe issued currency notes of Z\$ 500,000 denomination.

Table 2.1 Inflation Rates in Some Developed and Developing Countries during 1980s

Country	Period	Rate of Inflation
Australia	1980-90	7.2
China	1980-90	5.6
India*	1980-90	8.1
	1990-2000	8.0
Indonesia	1980-90	8.6
Nigeria	1980-90	16.7
Pakistan	1980-90	6.7
Sri Lanka	1980-90	11.0
UK	1980-90	5.7

* Based on GDP Deflator.

Inflation in India has off and on been a serious problem for the economy, and also for the policy makers. During the early 1970s, annual inflation rate had shot up to 24 percent. In April-September 2008, the inflation rate had varied between 10 percent and 13 percent despite a high growth rate of 9 percent in *GDP*. This had become a matter of great concern for both the RBI and the Finance Ministry.

In fact, inflation is generally associated with, and is often caused by, the high growth rate itself. Sometimes, high rate of inflation is the result of high growth rate, especially when there is a long gestation period—time lag between investment spending and generation of output. Whatever might be the reason—be it demand-pull, cost-push, or a combination of the two, or any other factor, like rise in oil price—*inflation creates economic, social, and political problems in the country, leading sometimes to the fall of the government*. Therefore, inflation is considered to be a serious macroeconomic problem necessitating formulation of suitable policy measures and effective implantation of policy for controlling price rise and maintaining inflation at a reasonable level.

2.1.4 The Issue of Unemployment and Poverty

Unemployment refers to that part of the *labour force*, or workforce, which is willing to work at the prevailing wage rate and is looking for a job but is not getting employment. The level of unemployment in a country is measured in terms of percentage of out-of-job labour force to total labour force. Labour force is that part of manpower which is willing to work at the on-going wages

⁵ Reported in *Times of India*, 23 December 2007.

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and salaries. According to ILO definition, manpower of a country consists of its population in the age-group of 15-65 years. Unemployment over a period of time—over a period of six months in a year or for a longer period—results in poverty of the unemployed people.

Unemployment and poverty have been a perennial problem in both DCs and LDCs—but prominently in LDCs—at different stages of their economic growth. Although, most industrial countries consistently had very low unemployment in the 1950s and the 1960s, they had a high rate of unemployment⁶ in the 1980s and the 1990s. For example, unemployment in UK had peaked at 12.2 percent in 1986 and 10.8 percent in 1993. France and Germany had unemployment of 12.5 percent and 11.7 percent, respectively, in 1997. Even Japan, a country which had never had unemployment after the Second World War, experienced unemployment of 5.4 percent in 2002. According to World Development Report (2004), unemployment rate in some countries was relatively very high, e.g., USA (5.8 percent), Japan (5.4 percent), and Australia (6.3 percent). Unemployment rate in Pakistan was very high (7.8 percent).

As regards unemployment in India, according to NSSO estimates, unemployment rate was 3.06 percent of the labour force. This estimate is highly questionable. If one goes by National Sample Survey estimates of population below the poverty line, it was 27.8 percent in 2004-05. Although questionable, the poverty estimate can be taken as the level of unemployment and underemployment in India. In spite of 60 years of growth and development efforts made by the country, the problems of unemployment and poverty continue to remain the most important macroeconomic issues of the country. A high rate of unemployment has remained a dominant and persistent *macroeconomic issue* not only in India but in most LDCs. Now this problem is also being faced by the DCs.

2.1.5 The Issue of Budgetary Deficits

The *government budget* refers to the annual revenue and expenditure of the government of a country. In the post-World War II period, government budget emerged as a powerful tool of macroeconomic management, control, and regulation of the economy. The use of government revenue and expenditure as weapons to solve macroeconomic problems of the country and to control and regulate the economy is called *fiscal policy*. *Fiscal policy* is used to accelerate the process of economic growth, to stabilise the economy, to reduce income inequalities, to promote employment opportunities, and so on. As stated in *Economic Survey*—2006-07, “Fiscal policy is the building block for an enabling macro-environment, which not only provides stability and predictability to the policy regime, but also ensures that national resources are allocated in terms of its defined priorities” (p.18). Economic functions and also the economic responsibilities of the governments have increased over time. This is a universal phenomenon.

With the increase in government's economic role and other functions, the size of the government budget has increased and so have the magnitude of the budget related problems. The most important budget related problems are managing budgetary deficits. In India, the total expenditure of the central government has increased from Rs 98,272 crore in 1990-91 to Rs 5,63,991 crore in 2006-07 (BE)—a six-time increase over a period of 16 years. However, government revenue over the same period has increased from Rs 54,954 crore to Rs 4,03,465 crore. Although, revenue has increased at a faster rate, *budget deficit* has risen from Rs 3,48,511 crore to Rs 4,65,791 crore during the same period. In fact, *budgetary deficit* of the central government has been increasing

⁶ For details, see Lipsey and Chrystal, *Economics*, op. cit., p.334.

almost continuously. The fiscal deficit of the government had risen from Rs 43,318 crore in 1990-91 to Rs 1,60,526 crore in 2006-07. Fiscal deficit of the government has crossed 6 percent of the GDP. The Finance Ministry has been trying unsuccessfully to bring it down to below 4 percent. The budgetary deficit and budget management have emerged as the major macroeconomic problems for the government in India.

Not only in India, the problem of persistent budgetary deficit is being faced by both the developed and the developing economies. The reason is that the government expenditure has been rising much faster than revenue. For instance, since the 1970s through the mid-1990s, the US economy faced a persistent problem of budgetary deficit⁷ and with exception of 1970 and 1988-89 and UK has had budget deficit throughout after the Second World War. The problem of budgetary deficit is common to most countries using fiscal policy as a tool of macroeconomic management. Although budgetary deficits can be managed simply by cutting down public expenditure and increasing the tax rate, this measure too has serious adverse implications for the economy as a whole. So, this method cannot be adopted straightforwardly. Thus, the most important and common macroeconomic problem related to government budget is the growing *budgetary deficits*.

2.1.6 The International Economic Issue

International trade has been going on since time immemorial. With the passage of time, however, the volume, the pattern, and the nature of international transactions have expanded at a tremendous speed, especially over the past two decades. As a result, the world economy is getting globalised very fast, so much so, that it is now being treated as a 'village economy'. Globalisation increases economic interdependence of the countries. With growing global interdependence, the economies are being exposed to the risk of getting adversely affected by the changes, especially by inflation, recession, and financial instability in countries of the trading partners. For instance, the economic recession in the US economy, born out of the subprime crisis, had caused global recession in 2008. Furthermore, the US dollar, the most stable and powerful currency of the world after the Second World War, depreciated in the last quarter of 2007 against virtually all major currencies, especially against the euro and the pound, and to lesser extent, against the rupee and Asian currencies. Dollar depreciation has nearly created a global problem, especially for those countries which have accumulated its large reserves. The major international economic issues that figure in the management of the economy are:

- (i) Growing balance of payments deficits,
- (ii) Exchange rate fluctuation, and
- (iii) Excessive inflow or outflow of capital.

Let us look at the implication of these international economic issues in context of the Indian economy. India has faced and is currently facing all such problems. Let us begin with *balance-of-payments (BOP) deficits*. Although India had off and on faced the problem of balance-of-payments (BOP) deficits since 1950-51, the country faced an unprecedented BOP deficit and foreign exchange crisis⁸. The foreign exchange crisis had brought the economy on the verge of

⁷ Rudiger Dornbusch, Stanley Fisher and Richard Startz, *Macroeconomics*, 9th ed. (Tata McGraw-Hill, New Delhi, 2004), p.33.

⁸ In general, a country needs forex reserves that are sufficient to meet payment for 90 days imports. But India had forex reserve to finance only 10 days imports.

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economic collapse in 1990. Thanks to the financial help from the IMF and the World Bank, the crisis could be averted.

As regards the *exchange rate problem*, India had pursued a fixed exchange rate policy, going intermittently for devaluation of the currency to adjust it to rupee depreciation. After 1991-92, India adopted a flexible exchange rate policy, and exchange rate remained fairly stable until 2005. Since 2006, however, rupee started showing signs of appreciation. According to India's Finance Minister, Chidambaram, rupee-dollar exchange rate is market determined. In 2007, the market determined rupee rate appreciated against dollar by about 25 percent. India is currently facing some economic problems due to rupee appreciation, and also due to sub-prime lending crisis in the US.

There is similar problem with inflow of capital. The inflow of funds in the form of FDI and FII and the sub-prime crisis in the US have lead to appreciation of the Indian currency. Appreciation of rupee has affected India's exports adversely, especially of handicrafts, IT products, and motor parts. Decline in exports has affected employment adversely. A large number of people are reported to have become jobless. About 200,000 workers have lost their jobs mainly because of decline in exports of handicrafts. Thus, rupee appreciation has become a matter of concern for the policy makers of the country.

The sub-prime crisis in the US has affected the economy in the same way. While addressing the National Development Council, the Prime Minister, Dr. Manmohan Singh, an ex-economist, said that with global integration, India could not remain immune to sub-prime lending crisis of the US which had hit global financial markets, and had also caused a global slowdown. These are a few examples from the Indian economy which show that international economic linkages expose countries to the risk of being adversely affected by international economic changes and ups and downs. With increasing globalisation, international economic issues are gaining more and more importance.

1.2.7 Conclusion

To conclude, the major macroeconomics issues that macroeconomists and policy makers have to address include: (i) achieving and maintaining a high growth rate, (ii) preventing business cycles, (iii) controlling inflation and stabilising price level—a major problem these days, (iv) finding a solution to the problems of unemployment and poverty, (v) managing the growing budgetary deficits, and (vi) managing international economic issues, such as BOP deficits, devaluation and appreciation of domestic currency, and inflow and outflow of capital. Finding solution to these economic problems requires an in-depth, logical, and systematic analysis of inter-relationships and interdependence of macroeconomic variables. The macroeconomists analyse these issues at both the theoretical and the empirical levels and formulate *macroeconomic theories*. Macroeconomic theories, on the other hand, provide analytical framework and guidelines for the formulation of appropriate economic policies for solving macroeconomic problems of the country. This is what *macroeconomics* is all about.

2.2 SOME CONCEPTS USED IN MACROECONOMIC ANALYSIS

Before we proceed to discuss macroeconomic theories, it will be useful to get acquainted with some of the basic concepts and approaches widely used in macroeconomic studies.

DEVELOPMENT OF MACROECONOMICS

Macroeconomic analysis is a relatively recent development in the field of economics. Before Keynes published his revolutionary *The General Theory of Employment, Interest and Money* in 1936, there was only one school of economic thought the Classical School. Classical economists focused only on microeconomics, believing that market forces or price mechanism would automatically guide an economy to full employment within a relatively short period of time. However, the prolonged high unemployment rates that gripped western private enterprise economies during the 1930s, which is called the Great Depression undermined this belief. Keynes' book published in response to the Great Depression, led to a new way of looking at the economy. Though Keynesian Theory successfully explained the cause of large-scale unemployment in the 1930s, and formulated effective policy prescriptions. It did not put an end to the further development of macroeconomics. New and different reconstructions of the Classical Theory began appearing, especially in the 1950s from the Neo-classical school of thought.

After World War II and until 1980, economic policies were primarily aimed at countering inflation and unemployment. Whenever unemployment levels rose governments used liberal fiscal and monetary policies, and whenever inflation levels rose, they tightened their monetary and fiscal policies.

This led some economists to argue that economic polices had become concerned only with short-run management of aggregate demand. Some of them proposed a fixed money growth rate to address issues like inflation and unemployment. These economists were called monetarists because of the importance they gave as a determinant of economic activity. In the 1970s, a new theoretical approach which led its foundations in Classical theory was developed. The major principle behind the New Classical Economics approach was the theory of Rational Expectations.

In the 1980s, a new school of economic thought called supply side economics gained prominence. Supply side economists stressed the importance of providing incentives to people to work and save and proposed reductions in tax rates to spur economic growth.

Perspectives of Macroeconomics

Macroeconomics is the study of the overall economic system, focusing on aggregate indicators such as GDP, inflation, unemployment, and monetary & fiscal policies. Various perspectives in macroeconomics have evolved over time, each emphasizing different aspects of economic performance.

Classical Perspective

Based on Adam Smith, David Ricardo, and John Stuart Mill.

Assumes markets are self-regulating due to price flexibility.

Focuses on the Say's Law: "Supply creates its own demand."

No role for government intervention as economies tend to full employment in the long run.

Keynesian Perspective

Introduced by John Maynard Keynes (*The General Theory of Employment, Interest, and Money*, 1936).

Argues that markets can remain in disequilibrium for long periods.

Emphasizes aggregate demand as the primary driver of economic output.

Supports active government intervention (fiscal policy) to stabilize the economy.

Monetarist Perspective

Led by Milton Friedman (*A Monetary History of the United States*, 1963).

Emphasizes the role of money supply in determining economic activity.

Argues that inflation is always a monetary phenomenon.

Criticizes fiscal policy, favoring monetary policy for economic stability.

New Classical Perspective

Based on Robert Lucas and Edward Prescott.

Introduces Rational Expectations Theory—people anticipate policy effects, reducing government policy effectiveness.

Believes in real business cycle (RBC) theory, where fluctuations result from real shocks rather than demand shifts.

Advocates minimal government intervention.

New Keynesian Perspective

Combines Keynesian ideas with microeconomic foundations (sticky prices, wage rigidities).

Supported by economists like Gregory Mankiw and David Romer.

Recognizes the short-run impact of demand-side policies while maintaining long-run classical neutrality.

Endorses fiscal and monetary policies but with a focus on minimizing distortions.

Source:

Gregory Mankiw – Macroeconomics (Harvard University)

Olivier Blanchard – Macroeconomics (MIT)

Rudiger Dornbusch & Stanley Fischer – Macroeconomics (MIT)

John Maynard Keynes – The General Theory of Employment, Interest, and Money

Milton Friedman – A Monetary History of the United States

2. The second paradox is related to *saving and investment*. If an individual saves and invests more, his or her income increases. But this is not true for the economy as a whole. The reason is if all the individuals with given incomes decide to save more and more, the consumption expenditure will decrease by the same amount. Decrease in consumption expenditure reduces the aggregate demand for consumer goods. This reduces the prospect for investment. The aggregate investment may even decrease which will reduce the level of aggregate income.
3. The third paradox pertains to *profit and wages*. At micro level, one tends to accept the proposition that the distribution of national income between wage incomes and profits depends on the relative bargaining power of the labour and the employers. According to Boulding, however, it depends on “a combination of other factors, the most important of which are decisions of management to invest, i.e., to accumulate real assets, and the complex of the decision of the whole society about liquidity preference”. Boulding concludes, “It is these paradoxes, more than any other factor, which justify the separate study of the system as a whole, not merely as an inventory or list of particular items”.

5 ORIGIN AND GROWTH OF MACROECONOMICS

As already mentioned, the foundation of macroeconomics, as a separate branch of economics, was laid down by a British economist, John Maynard Keynes (1883–1946) in his revolutionary book *The General Theory of Employment, Interest and Money* (1936). This should, however, not mean that the economists of the pre-Keynesian era had not given thought to the macroeconomic problems of the economy. Keynes has himself pointed out that the use of macro approach to certain economic phenomena can be traced back to the writings of the 16th century economists called ‘mercantilists’ and those of the later era. The economists of the 16th and 17th century, called ‘mercantilists’ were the first to use macro approach to the economic problems of those days. According to Keynes, the

mercantilism made “a contribution to statecraft, which is concerned with the economic system as a whole and with securing optimum employment of the system’s entire resources ...”¹⁴. The 18th century economists, called ‘physiocrats’ analysed the ‘circular flows of wealth’ in an economy in an aggregative framework. Quesnay’s *Tableau Economique* (1758) is regarded as one of the most remarkable macro models of the early days. The circular flow model was later developed and used by Walras, Wicksell, Bohm Bawerk and Schumpeter to analyse the flow of national income and expenditure. During the 18th century, Malthus contributed greatly to aggregative economic analysis in so far he pointed out the deficiency in the Say’s law and showed that aggregated demand might fall short of the full employment level and this may result in stagnation in demand for capital and subsequent stagnation in demand for labour. In the 19th century, Karl Marx used macro approach to economic analysis of the society. However, pre-classical macroeconomic views and thoughts were not strong enough to lay the foundation of macroeconomics.

In this section, we describe briefly the origin and growth of macroeconomics as a separate branch of economic science. The origin and growth of macroeconomics is reviewed here in three stages of its development: (i) classical macroeconomics, (ii) ‘Keynesian Revolution’ and macroeconomics, and (iii) post-Keynesian developments in macroeconomics.

1.5.1 Classical Macroeconomics

The ‘classical views’,¹⁵ refer to the views and thoughts of the *classical economists*. The classical economists are referred to the economists from Adam Smith, the founder of economics, to those of the 18th and 19th centuries. The views, thoughts and theories formulated by the *classical economists*, mainly by David Ricardo, John Stuart Mill, Robert Malthus, Alfred Marshall, and Arthur Cecil Pigou are regarded as the classical economics.

The classical economists had not developed any coherent macroeconomic theory. The macroeconomic views of the classical economists, as envisaged

by the economists of the post-Keynesian era are treated as the *classical macroeconomic postulates*. The classical postulates can be stated as follows.

According to the classical economists, if market forces—demand and supply—are allowed to work freely, the following macroeconomic features continue to exist.

1. There will always be full employment in the long run, and unemployment, if ever, will be a short-run phenomenon.
2. The equilibrium level of national income is determined at the level of full employment and national income is equal to the total cost of production.
3. The economy is always in equilibrium in the long run and there is neither overproduction nor underproduction in the long run.

Collapse of Classical Macroeconomics

The *macroeconomic postulates* of classical economists prevailed until 1929 – the year in which the Great Depression of 1930s had started. The Great Depression exposed the ‘inadequacy of the *theoretical* foundation of the *classical laissez-faire* doctrine’. It proved the classical postulates to be theoretically untenable. In fact, the Great Depression had taken place in the US in 1929 when the US economy was working on the *principles of the laissez faire system*. Yet the US stock market collapsed on 29 October 1929, which caused the devastation of the US economy. The devastation of the US economy had a widespread disastrous impact on the international economy causing the Great Depression of 1930s. During the period of Great Depression (1929–1939), there was large-scale unemployment in almost all free market industrial economies and their national income had declined to an unprecedented level. In the US, for example, unemployment had increased from about 3 per cent in 1929 to 25 per cent in 1933; production of goods and services had declined by 30 per cent; price level had fallen by 30 per cent; and business investment had dropped to almost nil¹⁶. Most industrial countries, e.g., the Great Britain, France and Germany, had experienced the similar devastation of their economy. The classical economics could neither offer an explanation to the causes and

consequences of the Great Depression nor provide any market solution to the economic problems faced by these countries. This marked the collapse of the classical macroeconomics.

1.5.2 Keynesian Revolution and Emergence of Macroeconomics

The collapse of classical economics created a big gap between classical economics and economic realities of the day. The need of the time was to have a fresh look at the working of the economic system and to devise the appropriate policy measures to revive the depressed economies. It was John Maynard Keynes – an erstwhile neo-classical economist¹⁷ – who revealed the limitations and inadequacy of the classical economics in dealing with economic problems at the national level in his book *The General Theory of Employment, Interest and Money* (1936). Keynes proved that classical economics was not theoretically sound enough to explain the working of the economy as a whole, to predict the consequence of the economic changes, and to provide solution to economic problems arising at the country level. Having pointed out the deficiencies and inadequacies of the classical economics, Keynes constructed his own macroeconomic theories related to national income, employment, and money market. Keynesian theories mark the foundation of **macroeconomics**. Keynesian contribution to economic science is treated as **Keynesian Revolution**.

The central theme of the Keynesian macroeconomics may be summarised as follows:

- The level of output and employment in the economy is determined by the aggregate demand for goods and services, given the resources of the country.
- Money market equilibrium and interest rate are determined by the aggregate demand for money, given the money supply.
- The unemployment in any country is caused by lack of aggregate demand and the economic fluctuations are caused by demand deficiency.

- The demand deficiency can be removed through compensatory government spending.

Keynesian economics stresses the role of *demand management* by the government for the stable growth of the economy. "Perhaps the most fundamental achievement of the Keynesian revolution was the reorientation of the way economists view the influence of government activity on the private economy"¹⁸. Contrary to the classical view that government spending 'crowds out' private investment, Keynesian economics stresses the favourable macroeconomic effects of the government spending¹⁹ on the national income and employment through its multiplier effect. The dominance of Keynesian thought banished the classical view at least for sometime.

The period between the late 1930s and the mid-1960s is called the "period of Keynesian Revolution" or the "Keynesian Era". During this period, most economists were Keynesian and most governments, especially in the developed countries, had adopted Keynesian policies. The Keynesian thoughts had pervaded also the underdeveloped countries as most less developed countries struggling to emerge out of their 'low-equilibrium trap' adopted Keynesian approach to initiate the process of economic development. In fact, India's Development Plans are largely based on the Keynesian theory of growth and employment. So all-pervasive was the Keynesian economics until the 1960s!

However, the real economic world has neither conformed to any particular economic thought or principle, nor complied with any idea or ideology. Economic system goes through a continuous process of evolution. It passes from one system to another, rendering prevailing thoughts, theories and laws redundant and forcing economists to examine the relevance of existing theories and to find new explanation to emerging economic conditions. This is what happened with Keynesian revolution also as it gave way to new kinds of revolutionary thoughts and theories encapsulated as post-Keynesian macroeconomics as discussed below.

1.5.3 Post-Keynesian Developments in Macroeconomics

The Keynesian economics started showing signs of its failures in the early 1970s. Keynesian economics, especially Keynesian fiscal measures, failed to provide solution to economic problems of low growth, high unemployment and high rate of inflation faced by most developed countries, especially by the US. It could offer neither a reasonable explanation nor an effective solution to the problem of "stagflation" faced by the US in the early 1970s. The inefficacy of the Keynesian policy measures lead to the growth of a new school of macroeconomic thoughts, called "monetarists". Monetarism was subsequently followed by the emergence of some other schools of macroeconomic thoughts. The post-Keynesian developments in macroeconomics include the following kinds of macroeconomic thoughts and theories:

1. Monetarism: A Counter Revolution
2. Neo-classical Macroeconomics
3. Supply-side Economics
4. Neo-Keynesianism

Let us have a brief look at the origin and central theme of these areas of macroeconomics.

Monetarism: A Counter-Revolution

As mentioned above, the Keynesian economics started showing the signs of its failure during the 1970s as it failed to provide solution to economic problems of those days. This raised the doubt about the relevance and applicability of Keynesian economics to the problems of growth and stability. A group of economists, called "monetarists", led by Milton Friedman claimed that Keynesian theory had failed to predict national output, price level, rate of employment and unemployment, and interest rate. The monetarists came out with a new revolutionary thought. According to the monetarists, the *role of money* is central to the growth and stability of national output, not the role of aggregate demand for real output, as Keynesians believe. In the opinion of the monetarists, *money supply is*

the main determinant of output and employment in the short run and price level in the long run. The monetarists added a new dimension to both macroeconomic theory and policy. At the theoretical level, the emphasis shifted from the analysis of the role of aggregate demand for real output to the aggregate demand for and supply of money, and at the policy level, the emphasis shifted from aggregate demand management to monetary management.

The monetarists' view led to a prolonged debate between the monetarists and the Keynesians. The central theme of debate was 'what determines the aggregate demand'. "While mainstream theories point to a number of different forces that influence aggregate demand—monetary and fiscal policies, investment spending, net exports and so forth—monetarists hold that changes in the money supply are far more important than all other forces in affecting nominal GNP in the short run and prices in the long run"²⁰. The debate remains inconclusive.

Neo-Classical Macroeconomics

While the debate between the Keynesians and the monetarists continued, Keynesian economics was attacked in the 1980s by another group of economists, called the 'radicalists'. Their macroeconomic propositions are called *neo-classical macroeconomics*. The neo-classical macroeconomics is the creation of virtually one economist, Robert E. Lucas, the Nobel Laureate of 1995. In the opinion of Lucas, Keynesian orthodoxy has turned redundant not only from the economic policy point of view but also from theoretical and methodological points of view. Many other economists joined Lucas creating a neo-classical school. The neo-classical school emphasises the role of *rational expectations* of the individuals about future economic events, especially those working on the supply side of the economy, i.e., the producers, and their expectations about the future policies of the government. The core of the radicalist thought is that the people's rational expectations about the government's monetary and fiscal policies determine the behaviour of aggregate supply and aggregate demand in such a way that real output remains unaffected, though the prices and wages go up. For instance, suppose anticipated changes in monetary and fiscal policies cause a forward shift in aggregate demand curve and an immediate

and equal backward shift in the aggregate supply curve. These kinds of shifts in aggregate demand and supply curves do not show any change in the real output but these changes do show a rise in wages and prices. However, the neo-classical macroeconomics too remains a matter of inconclusive debate.

Supply-Side Economics

While the issue of what determines the aggregate demand continued to be debated, there emerged another school of macroeconomists, called the “supply-side economists”. Recall that the Keynesians and the monetarists had both built their argument for ‘what determines the aggregate demand’ on the basis of the factors operating on the demand side of the market. In contrast, the “supply-side economists”, led by Arthur Laffer, emphasised the role of the factors operating on the supply side of the market. They attempted to provide an alternative to the Keynesian theory of employment and output. While the Keynesian economists – the demand siders – emphasise the role of shift in aggregate demand in changing employment and output, supply-siders stress the role of shift in the aggregate supply curve. Arthur Laffer, widely known for his famous “Laffer curve”²¹, argued that a cut in the tax rate shifts aggregate supply curve rightward and leads to a rise in output and employment. Note that both Keynesians and supply-siders considered fiscal policy as the main instrument of economic management.

Neo-Keynesianism

In spite of several path-breaking contributions made to macroeconomic thoughts over the past four decades since 1960s, Keynesian economics remains the focal point of reference for all the schools of macroeconomists either for attack or for its reconstruction. In the process, there emerged another school of thought called “Neo-Keynesians”²². Contrary to the new classical group, the Neo-Keynesians argue that the market is not always cleared, in spite of individuals (households, firms and labour) working for their own interest. They give the reason that ‘information problem and cost

of changing prices lead to some price rigidities²³ which cause fluctuations in output and employment.²³

Conclusion To conclude, it may be added that "Mankiw has rightly remarked that macroeconomics is [still] a young and imperfect science".²⁴ Nevertheless, macroeconomics theories and policies as developed by the economists so far have gained wide recognition and application. This fact has led to emergence of macroeconomics as a dominant branch of economic science.

1.6 SOME BASIC CONCEPTS AND APPROACHES TO MACROECONOMIC ANALYSIS

In the preceding section, we have narrated briefly the emergence and growth of macroeconomics as a branch of economics. The macroeconomists of different generations have adopted different concepts and have applied different approaches to analyse the macroeconomic phenomena. In this section, we outline some basic concepts used and approach adopted by the economists in general as it will be helpful in comprehending macroeconomic theories developed by the economists of different generations.

1.6.1 Concept of Stock and Flow Variables

Macroeconomic variables used in macroeconomic studies have been described in Section 1.2 of this chapter. In the theoretical analysis of a macroeconomic phenomenon, macro variables are generally classified under two categories: (i) **stock variables**, and (ii) **flow variables**. A brief description of *stock variables* and *flow variables* are given below:

- (i) **Stock Variables:** Stock variables refer to the quantity or value of certain economic variables estimated at a point of time, depending on the period of financial accounting, e.g., at the end of the financial year – 31st March - or at the end of the calendar 31st December. In economic analysis, the

SYBCOM 2024-25
Fundamentals of Macroeconomics
Unit-1: Aggregate Demand and Aggregate Supply

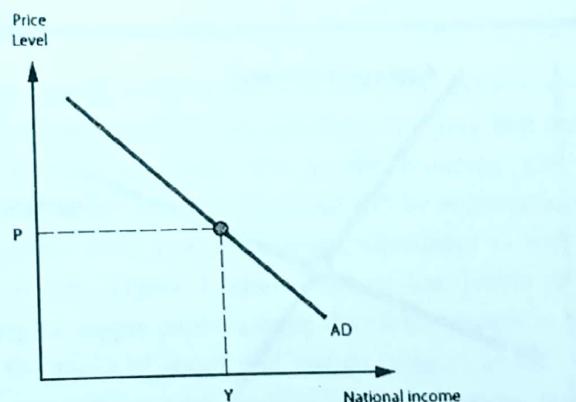
The Essence of Aggregation

Aggregate functions deliver a single number to represent a larger data set. Aggregation is the process of combining things into a single group or total. Economists use the outputs of data aggregation to plot changes over time and project future trends. The models created out of aggregated data can be used to influence policy and business decisions. The key overall concepts in analyzing output, inflation, growth, and the role of policy are aggregate demand and aggregate supply.

Aggregate Demand

Aggregate Demand is the relationship between spending on goods and services and the level of prices. Aggregate Demand is the total quantity of all goods and services consumed in an economy at all possible price levels at a given time. The aggregate demand curve can be shifted by monetary and fiscal policy. When unemployment is high, increased spending, or an increase in aggregate demand, will raise output and employment with little effect on prices. Under such conditions, for example, during the great depression of the thirties, it would certainly be appropriate to use expansionary aggregate demand policies to increase output. But if the economy is close to full employment, increased aggregate demand will be reflected primarily in higher prices or inflation.

Figure 1: Aggregate Demand

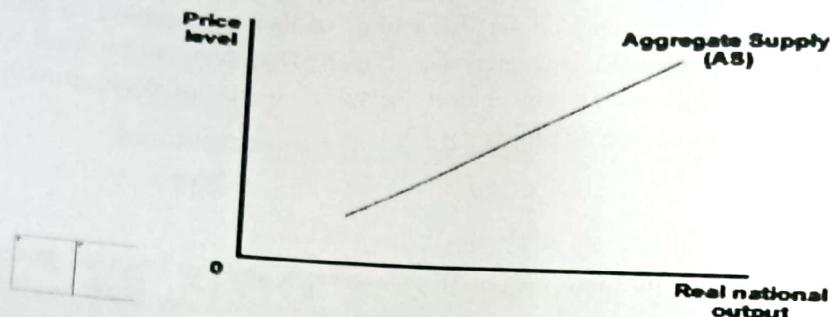


Aggregate Supply

Aggregate Supply curve specifies the relationship between the amount of output firms produce and the price level. Aggregate Supply is the total quantity of all goods and services produced in an economy at all possible price levels at a given time. The aggregate supply curve shows the price level associated with each level of output. It can, to some extent, be shifted by fiscal policy.

The supply side not only enters the picture in telling us how successful demand expansions will be in raising output and employment, but it also has a role of its own. Supply disturbances, or supply shocks, can reduce output and raise prices, as was the case in the 1970s when the price of oil increased sharply. Conversely, policies that increase productivity, and thus the level of aggregate supply at a given price level, can help reduce inflationary pressures.

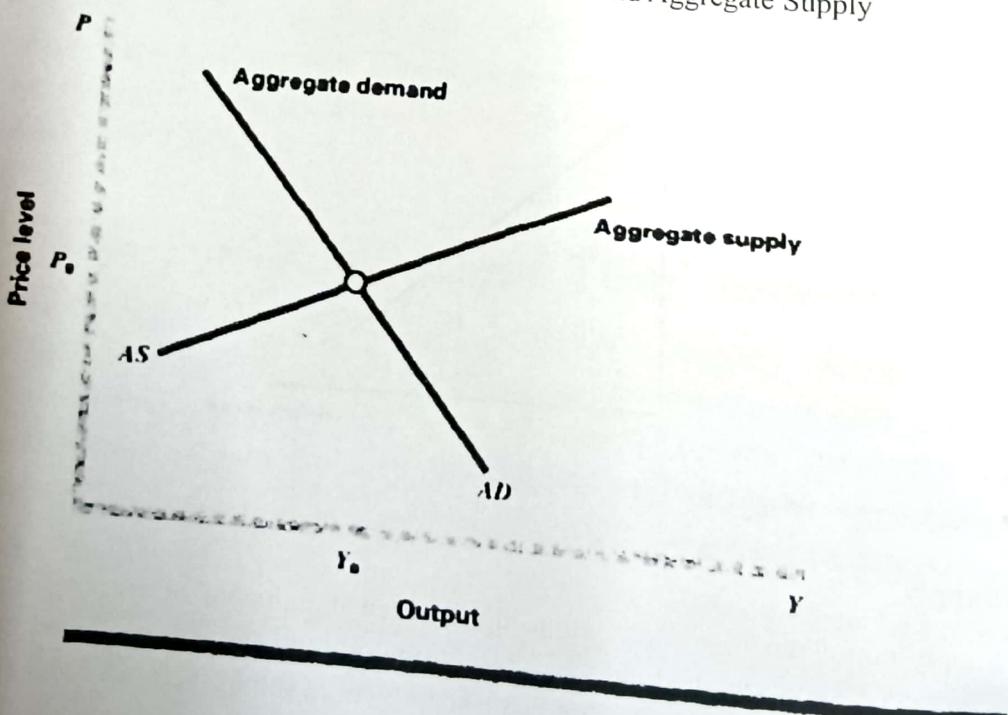
Figure 2: Aggregate Supply



Price level and Output Determination

The level of output and the price level are determined by the interaction of aggregate demand and aggregate supply.

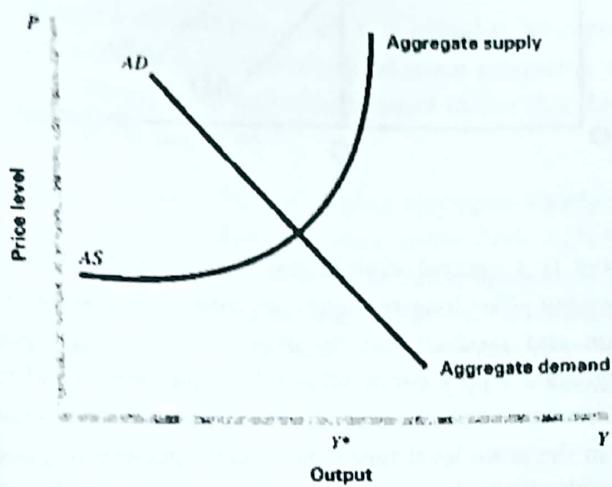
Figure 3: Linear Aggregate demand and Aggregate Supply



Shifts in either aggregate supply or aggregate demand will cause the level of output to change—thus affecting growth—and will also change the price level—thus affecting inflation.

Figure 3 shows aggregate demand and supply curves. The vertical axis P is the price level, and the horizontal axis Y is the level of real output or income. Aggregate demand depends on determine the price level and output level, as shown above. Aggregate supply and demand interact to Y_0 , the equilibrium level of output. In Figure 3, P_0 is the equilibrium price level and then the extent to which output and prices, respectively, are changed depends on the steepness of the aggregate supply curve. If the AS curve is very steep, then a given increase in aggregate demand mainly causes prices to rise and has very little effect on the level of output. If the AS curve is flat, a given change in aggregate demand will be translated mainly into an increase in output and hardly at all into an increase in the price level.

Figure-4 Non Linear Aggregate Supply

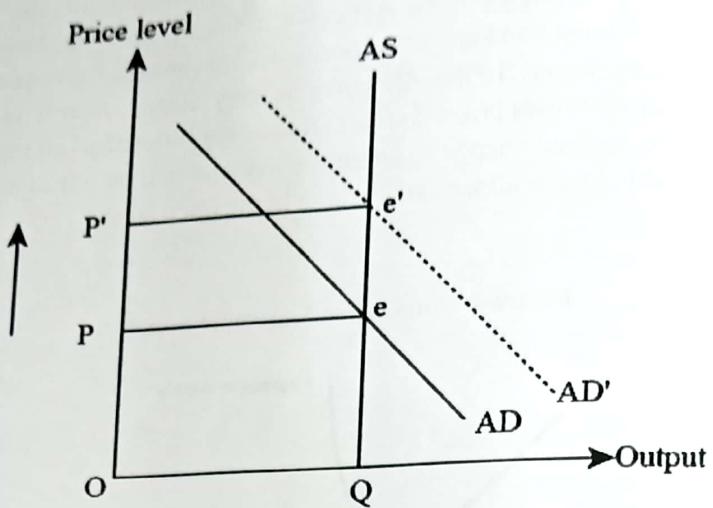


A key fact about the aggregate supply curve is that it is not linear. At low levels of output, prices do not change much on the aggregate supply schedule, implying that more output will be supplied without much increase in prices. But as the economy gets close to full employment or potential output, further increases in output will be accompanied by increased prices. One of the crucial points about macroeconomic adjustment is that the aggregate supply curve is not a straight line. Figure 4, shows that at low levels of output, below potential output Y^* , the aggregate supply curve is quite flat. When output is below potential, there is very little tendency for prices of goods and factors (wages) to fall. Conversely, for output above potential, the aggregate supply curve is steep and prices tend to rise when demand increases. The effects of changes in aggregate demand on output and prices therefore depend on the level of actual relative to potential output.

Full Employment Equilibrium

The **aggregate demand/aggregate supply model** is a model that shows what determines total supply or total demand for the economy and how total demand and total supply interact at the macroeconomic level. On X-axis we have Aggregate Output and on Y-axis we have Price level.

Figure 5: Shift in Aggregate Demand Curve

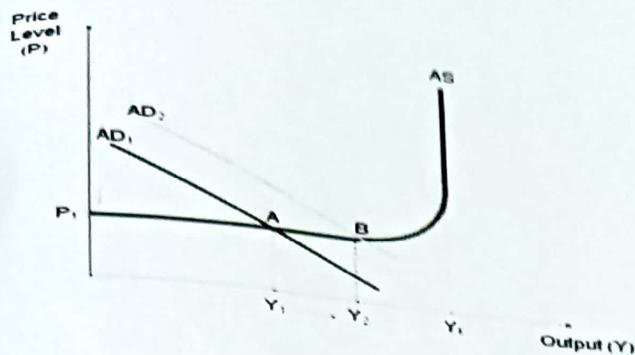


The aggregate-supply curve is a vertical straight line at full employment level of output because the price level does not affect long-run aggregate supply. Economic forces of various kinds (such as population and productivity) do affect long-run aggregate supply. The intersection of vertical aggregate supply curve AS at full-employment level of output Q and aggregate demand curve AD determines the price level. The aggregate-demand curve slopes downward because a fall in the price level raises the overall quantity of goods and services demanded through the wealth effect, the interest-rate effect, and the exchange-rate effect. If the AD curve shifts to the right, then the equilibrium the price level will rise. If the AD curve shifts to the left, then the price level will fall. The aggregate-demand curve might shift to the left when something (other than a rise in the price level) causes a reduction in consumption spending (such as a desire for increased saving), a reduction in investment spending (such as increased taxes on the returns to investment), decreased government spending (such as a cutback in defence spending), or reduced net exports (such as when foreign economies go into recession).

Unemployment Equilibrium

Underemployment equilibrium describes a state in an economy where unemployment is persistently higher than usual. In this state, the economy has reached a point of macroeconomic equilibrium somewhere below full potential output, which results in sustained unemployment.

Figure 6:



An economy in long-run equilibrium is one that is said to be experiencing full employment. When an economy is below full employment, it is not producing what it would have were it in full employment. This state of underemployment means that there is a gap between actual and potential output in the economy.

As shown in figure 6, we have vertical sloping aggregate supply curve. Here it can be seen that even when the aggregate demand curve shifts from AD_1 to AD_2 , i.e from A to B equilibrium level, it is still below the level of full-employment Y_f which suggests that the economy is working at underemployment or there is still unemployment in the economy even though there is more change in output level (Y_1 to Y_2) than price level .

Conclusion:

The aggregate demand and aggregate supply curve explains here only the output relationship with price level at conceptual level. It is important to note that explanation is not provided for detail analysis on short run and long run. Various levels of output determination here only indicates inflation scenarios consistent with either full employment level or unemployment levels of output. The various changes in the price level clearly connected to real output in the economy, therefore it is output or output gap that determines the remaining story on inflation.

Sources:

Dornbusch and Fischer: Page no 20-23

H.L.Ahuja : Page no 66-67, 69-72