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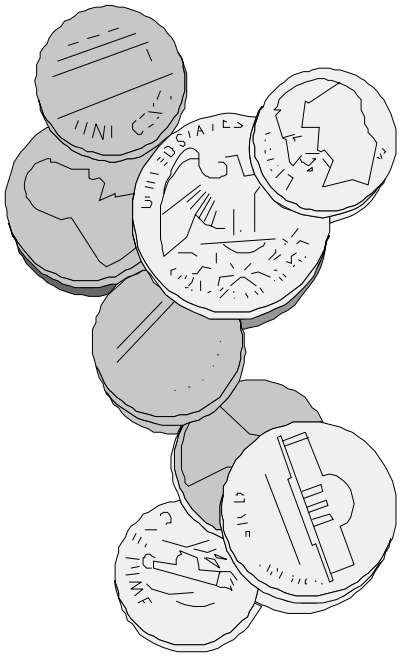
Chapter 2

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,

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 spectular 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 macroeconomits.

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 nations 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 duing 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 incomes, 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

[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 2000-05[2]. 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.

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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.

Nevertheless, the fact remains that factors and forces that cause a business cycle are always present in the growing ecconomies. 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 become 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 of 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 reported[4] 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 year[5]. 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.

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 unemployment[6] 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 deficit[7] 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 straightaway. 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 crisis[8]. The foreign exchange crisis had brought the economy on the verge of

7. Rudigar 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.

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.

2.2.1 Stock and Flow Variables

Macroeconomics uses certain economic aggregates, called **macroeconomic variables**, to assess the performance and to analyse the behaviour of an economy. Macroeconomic variables that figure in macroeconomic studies are generally grouped under (i) **stock variables,** and (ii) **flow variables**. Another kind of variables used in macroeconomic analysis are called **rates**, expressed in terms of percentage rates, e.g., percentage rate of economic growth, inflation, savings, investment, interest, etc. A brief description of stock and flow variables is given below.

The **stock variables** refer to the quantity or value of certain economic variables given at a *point in time*, e.g., on 31st March 2006 or 31st December 2007. In other words, the variables that are measured with reference to a point in time are stock variables. For example, the water stored in a tank at a point in time is a stock variables and number of books in a library on a particular date is a stock variable. In economics, the stock of capital in a country, the number of persons employed, the total money supply, all at a point in time, are some examples of macro stock variables.

The **flow variables**, on the other hand, are the variables that are expressed per unit of time, e.g., per hour, per week, per month, or per year. For example, *GDP*, aggregate consumption, aggregate saving, aggregate investment, aggregate exports, aggregate imports, etc. are ***macro flow variables.***

To understand the distinction between stock and flow variables, see the following examples. The water accumulated in a lake is a stock variable but the quantity of water flowing in or flowing out per unit of time (per day or per week) is a flow variable. Similarly monthly provision of sugar in a household, i.e., the quantity of sugar stocked for monthly consumption, is a stock variable and quantity of sugar consumed per day is a flow variable. A fixed deposit with a bank is a stock variable and interest earned on the deposit, e.g., 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 2.2.

Table 2.2 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	Exports (X) and Imports (M)
Labour force	Change in inventories
Total employment	Government revenue (R)
	Government expenditure (G)

Some flow variables are functionally related to their stock counterpart and *vice versa*. For example, 'investment' is the flow counterpart of 'stock of capital' and 'change in inventories' is the flow counterpart of 'inventories'.

It is important to note that the classification of stock and flow variables, as given above, is a matter of 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 stock for the year of reference. Similarly, employment is a stock variable, from head-count point of view, but from the view point of work effort in terms of man-hours, it can be treated as a flow variable.

Furthermore, macroeconomic variable 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."[9] He cites some examples of certain variables which are open to such confusion. 'Money is stock variable' but when exchanged for goods, it become '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 for himself whether it is a stock, a flow, or a ratio concept. … Much confusion will be saved by this exercise."

2.2.2 Equilibrium and Disequilibrium

The concepts of equilibrium and disequilibrium are widely used in both microeconomic and macroeconomic analyses. While microeconomics uses, in general, partial equilibrium analysis, macroeconomic analysis is largely of general equilibrium nature[10]. In macroeconomics, the partial equilibrium concept is applicable only to sectoral analysis, when the macroeconomic analysis is confined either to the product sector or to the monetary sector. Here, we describe briefly the concepts of equilibrium and disequilibrium as applicable to macroeconomic analysis.

Equilibrium In economic sense, equilibrium refers to a state or situation in which opposite economic forces, e.g., demand and supply, 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."[11] 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 This is the state in which the opposite forces (e.g., demand and supply) are in imbalance. The factors causing disequilibrium arise out of the working process of the economy.

9. Gardner Ackley, *Macroeconomic Theory*, (Macrnillan, 1961), p.6.

10. For a detailed discussion on the concepts of equilibrium and disequilibrium, see author's *Principles of Economics*, (Vikas Publishing House, Delhi, 2004), ch.3.

11. Fritz Machlup, "Statics and Dynamics : Kaleidoscopic Words" in his *Essays in Economic Semantics*, (NJ, Prentice-Hall, 1963).

The working of a market economy is governed by such a large number of interrelated and interacting forces that a continuous balance between market forces—demand and supply—cannot be expected. In fact, imbalances between economic forces are a routine matter in a market economy. The reason is that economic activities are undertaken by millions of decision makers—consumers, producers, workers, bankers, exporters, importers, and the government, and their decisions need not always coincide. The result could be disequilibrium in the economy.

2.2.3 Partial Equilibrium and General Equilibrium Analysis

Two other concepts which are often used in macroeconomic analyses are partial equilibrium and general equilibrium.

Partial Equilibrium Analysis Conceptually, partial equilibrium analysis is the analysis of a part 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 *ceteris paribus* assumption, i.e., it assumes that all other things or variables, specially the related ones, remain constant. The entire analysis of determination of equilibrium price and output and input prices is based on partial equilibrium analysis. For example, analysis of car price determination simply on the basis of its demand and supply, assuming all other factors supposed to affect the car prices to remain constant, is partial equilibrium analysis. It assumes all other factors affecting demand for car, e.g., prices of car substitutes (e.g., public transport system), petrol price, income of the consumers, excise duty and sales tax, etc. to remain constant. Partial equilibrium analysis is used fruitfully where 'feedback' and 'spillout' effects, if any, are not of great consequence.

In macroeconomics, partial equilibrium analysis is used when equilibrium conditions of *product sector* and *money sector* are analysed separately in isolation of one another. For instance, John Meynard 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 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 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 and in 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 capital, total demand for and total supply of money, etc. As mentioned above, it studies the interrelationships and interdependence of these variables and seeks to determine the general equilibrium of the economy.

2.2.4 Static, Comparative Static and Dynamic Analysis

Static and dynamic analyses[12] refer to two ways of analysing a subject matter of macroeconomics. When an economic phenomenon is analysed under static conditions, i.e., as it stands at a point in time, the analysis is called 'static analysis' and when the subject is analysed under changing conditions, the analysis is called 'dynamic analysis'. Macroeconomics studies an economic phenomenon 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 in a 'state of rest' or in 'a state of motionlessness'. For example, a table placed in a room, a book lying on the table, and a car parked on the road is in the state of rest or motionlessness. But 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. However, for the purpose of analysing an economy at a point in time, 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". In real world, "No economic system is ever at rest in anything like the mechanical sense."[13] A static economy means an economy or in which normal activities go on but there is no change in the size of the economy or in the level of national output, stock of capital, prices and employment.

A static economy as described above may not exist in reality. However, economists create such a static economy—an abstract economy—for the purpose of theoretical analysis. According to Schumpeter, a static economy refers to "an economic process that merely reproduces itself."[14] When an economy is studied under static conditions, it is called *static analysis*. For static analysis, a static model is used. A model of an abstract economy is created by a "rigorous formulation of conditions [assumptions] under which it is possible to make generalisations about the factors determining economic equilibrium."[15] A static economy is insulated from the influence of possible external changes. A static macro-model assumes that there is no change in the size of the economy, no change in national output, prices and employment. In a static economy, the basic forces of change, like stock of capital, technology, population, nature of business organisations, and tastes and preferences of the people remain unchanged over the reference period. 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*. "… a static equilibrium by no means implies a state of idleness, but one in

12. The terms 'statics' and 'dynamics' are derived from Greek words '*statikos*' meaning 'causing to stand still' and '*dynamikos*' meaning 'causing to change', respectively. For a detailed discussion on the concepts of 'static' and 'dynamic' see author's *Principles of Economics* (Vikas Publishing House, New Delhi, 2004), ch. 4.

13. Hicks, John R., *Capital and Growth*, (Oxford University Press London, 1965), p.6.

14. Schumpeter, J. A, *History of Economic Analysis*, (Oxford University Press, NY, 1970), p.964.

15. N. Kaldor, "The Determinateness of Static Equilibrium", *Rev. of Eco. Stud., February* 1934, reproduced in his *Essays on Value and Distribution*, (London, Gerald Duckworth & Co., 1960), p.13.

which works is steadily going forward day by day and year after year but without increase or diminution".[16]

Another important feature of static analysis is that the *variables used in this kind of analysis have no past or future and all 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 such a 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 generalisations or theoretical propositions regarding the relationship between the related variables under static conditions.

Comparative Statics Comparative statics is a comparative study of economic conditions at two static equilibrium positions at two different points in time. In a comparative static analysis, in fact, "… 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 …"[17] 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 the 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 static approach, 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 following are two such major issues:

(i) Does a dynamic economy, when displaced from one equilibrium, ever reach another equilibrium position?

(ii) What path is a dynamic economy 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 a dynamic economy follows 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 the job.

Economic dynamics studies the 'factors and forces' that set an economy in motion and lead it to a new equilibrium at a higher or lower level. It 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 involve a *time-lag*, i.e., the time that a change in any economic

16. R. F. Harrod, in his *Towards Economic Dynamics*, (Macmillan, London, 1960), p.3.

17. Eric Schneider, *Pricing and Equilibrium*, (London, Allen & Unwin, 1962), p.236.

variable takes to affect the other related variables, and the time that other variables take to adjust themselves to the change. Dynamic analysis takes into account the time lag involved in the process of adjustments. It studies the nature and the magnitude of changes and finds whether they are oscillatory or dampening—if oscillatory, then whether divergent or convergent. If they are convergent, the economy may reach another equilibrium. If changes are divergent, the economy may not attain another equilibrium position—it may keep oscillating constantly.

2.2.5 Distinction between Economic Statics and Dynamics

The distinctive features of static and dynamic analyses can be summarised as follows.

(i) Economic statics is an abstraction from reality whereas economic dynamics is the study of the real world.

(ii) All the variables in a static analysis are *undated* in the sense that they are taken at a point or unit of time whereas in dynamic analysis, all variables are dated, i.e., their movement on time scale is known.

(iii) Economic statics is a timeless analysis whereas in economic dynamics, time is used as one of the variables because time works as a determinant of other variables. For example, national income of a country in time t depends on its value in time t_{-1}.

(iv) In static analysis, fundamental economic conditions are assumed to be given and known, but in a dynamic analysis, they continue to change over time.

(v) Dynamic analysis has predictive power which static analysis does not have, though comparative statics can be used for the purpose.

2.3 MACROECONOMIC MODEL BUILDING

Macroeconomics, like any theoretical branch of economics, uses a set of theoretical formulations derived on the basis of some macroeconomic models. Macroeconomists have devised and developed, over time, a set of 'elegant and remarkably powerful' models for the purpose of analysing the behaviour and performance of the economic system as a whole. The 'economy as a whole' is an extremely complex and intricate system because each and every element and variable of the economy is interrelated, interlinked, interdependent and interactive. To analyse such a complex system systematically and scientifically is an extremely complex and a rather impossible task.

However, in order to study a macroeconomic phenomenon, macroeconomists divide the entire system under different sectors with common features and characteristics, and develop a simplified model to study the selected macroeconomic phenomenon. This process is called *model building.* A macroeconomic model, or any economic model for that matter, is an abstraction of a macroeconomic phenomenon from the real world, with the purpose of creating a manageable hypothetical world. The model so created is used as a basic tool of analysis to describe, explain and derive the relationship between any two or more macroeconomic variables. Precisely, *a macroeconomic model is the representation of the economic phenomenon in terms of a set of behavioural assumptions, definitions, simultaneous equations, and identities.* Practically, the model works as a road map for the purpose of study. It shows the path to be followed to reach the destination.

A macroeconomic model is constructed by the following process:

(i) Specifying the subject of study and segregating it from the rest of the system;

(ii) Specifying and defining the chosen *macroeconomic variables;*