

PREFACE

In the curricular structure introduced by this University for students of Post Graduate degree programme, the opportunity to pursue Post Graduate course in Subjects introduced by this University is equally available to all learners. Instead of being guided by any presumption about ability level, it would perhaps stand to reason if receptivity of a learner is judged in the course of the learning process. That would be entirely in keeping with the objectives of open education which does not believe in artificial differentiation.

Keeping this in view, study materials of the Post Graduate level in different subjects are being prepared on the basis of a well laid-out syllabus. The course structure combines the best elements in the approved syllabi of Central and State Universities in respective subjects. It has been so designed as to be upgradable with the addition of new information as well as results of fresh thinking and analysis.

The accepted methodology of distance education has been followed in the preparation of these study materials. Co-operation in every form of experienced scholars is indispensable for a work of this kind. We, therefore, owe an enormous debt of gratitude to everyone whose tireless efforts went into the writing, editing and devising of a proper lay-out of the materials. Practically speaking, their role amounts to an involvement in invisible teaching. For, whoever makes use of these study materials would virtually derive the benefit of learning under their collective care without each being seen by the other.

The more a learner would seriously pursue these study materials the easier it will be for him or her to reach out to larger horizons of a subject. Care has also been taken to make the language lucid and presentation attractive so that it may be rated as quality self-learning materials. If anything remains still obscure or difficult to follow, arrangements are there to come to terms with them through the counselling sessions regularly available at the network of study centres set up by the University.

Needless to add, a great part of these efforts is still experimental—in fact, pioneering in certain areas. Naturally, there is every possibility of some lapse or deficiency here and there. However, these do admit of rectification and further improvement in due course. On the whole, therefore, these study materials are expected to evoke wider appreciation the more they receive serious attention of all concerned.

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Paper-III
Module 1 & 2
Macroeconomics and International Economic Problems

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**Netaji Subhas
Open University**

**Post Graduate : Commerce
M. Com-III**

Module

1

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Unit 1 Macroeconomic Paradigms

Structure

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1.0 Objectives

By the time you have studied this unit you should be able to :

- Explain what is paradigm?
- Explain different economic paradigms.
- Explain their implications for LDCs.

1.1 Introduction

A paradigm is a set of ideas governed by a set of common rules and assumptions. The history of modern economic thought traces out several competing schools of thought, each of which can be dubbed as separate school of thought. They include classical thought, Keynesian thought, monetarists' and new classical thought.

While the classical school describes equilibrium as a full employment condition, Keynesian school pinpoints the existence of equilibrium at the underemployment level. Monetarists put stress on the role of money in explaining the economy, the new classical thought is based upon rational expectation assumptions.

These theories are not in toto applicable for LDCs where both lack of aggregate demand and supply side bottlenecks exist.

1.2 What is a Paradigm?

A paradigm is a philosophical and theoretical framework of any discipline within which laws and generalizations are formulated. In Economics, paradigms are used to make

assumptions about the fundamental nature of some aspects of the economic world, such as whether there economic growth is a univereal phenomenon. These assumptions are testable within the domain of the paradigm, though they may not prove the universality of the paradigm. Thus a paradigm does not always lead to a theory.

The history of modern economic thought may be interpreted as consisting of competing paradigms such as classical thought, Keynesian thought, monetarism, the new classical thought etc. Each one of these is based upon independent set of assumptions, which indicates how each economic paradigm views the working of the economic system in its own way.

1.3 The Classical System

In this section we will discuss classical, Keynesian, monetarists and new classical systems. The classical model of income and employment generation was mainly formulated from the ideas of Adam Smith, David Ricardo, J. B. Say, Marshall and Pigou. These economists believed that in a competitive capitalist economy, there exists an automatic mechanism that brings about the full employment equilibrium. Any inconsistency, i.e. inequality between demand and supply which moves the economy away from its equilibrium will immediately lead to change in price level and wage rate and would move the economy back to a new full employment equilibrium position. Due to this self equilibrating character under competitive capitalism there is no chance for existence of any unemployment. If somehow there is unemployment in the short run, then it will immediately lead to a downward revision of the wage rate driving the economy back to the full employment level. Another important characteristic of the classical model is that, the whole economy is divided into two sectors : the real sector consisting of markets for goods and services and the monetary sector consisting of the money market. The real sector is totally independent of the monetary sector. Further, money plays a neutral role of determining economic activities under the classical system.

Let us now briefly build up the classical model. The aggregate functional relations on which the classical system depends are :

- (a) The aggregate production function.
- (b) The demand for labour.
- (c) The supply of labour.
- (d) The saving function.
- (e) The investment function.
- (f) The demand function for money.

These functional relations interact among themselves to maintain the product market, money market and labour market equilibrium.

The basic assumptions of the classical system include :

- (i) Money wage is flexible;
- (ii) Price is flexible;
- (iii) Real variables are determined in the real sector;
- (iv) Nominal variables like price level is determined in the monetary sector;
- (v) Rate of interest is determined by the equality of savings and investment, and interest rate does not exert any impact on full employment equilibrium condition.

Let us now find how equilibrium is determined in different markets under the classical framework mentioned above.

The production function under the classical framework describes the relationships between real income, Y , and the number of workers employed (the rate of growth of capital is considered not to affect the production function under the classical framework). The labour supplied in the classical system is assumed to be an increasing function of the real wage rate. On the other hand, the demand for labour (determined by the marginal productivity of labour) is assumed to be negatively related to the real wage, that is, as real wages rise the demand for labour will fall and vice versa. The equilibrium real wage is determined at the point where the demand for labour and the supply of labour are equal. This equilibrium also determines the full employment level in the economy as wages are assumed to be fully flexible. Once we obtain the equilibrium level of employment, we can easily find the equilibrium level of output with the help of the production function (as production is assumed to be dependent on the level of employment). Thus the full employment level of output that is produced in the economy is determined by the labour market equilibrium. But to maintain the commodity market equilibrium, it must be ensured that the amount supplied must be equal to the amount demanded. In the classical model this is taken care of by the famous Say's law. The law states that "supply creates its own demand". This law can be traced back to the barter economy where any sales always equalled the amount demanded and thus there does not exist any excess demand or excess supply. This statement, though has its origin in the barter economy, can also be applied into an economy where money is used. The classical economists believed that people don't want to hold idle money and hence would promptly spend it on other goods and services. This instantaneous spending not only ensures equilibrium in the commodity market but also limits the utility of money only as a medium of exchange. Thus we find that the entire analysis of the classical economists is based on Say's law, which ensures that the economy always operates at the full employment level of output.

Say's Law states that supply creates its own demand. If goods are produced, there will automatically be a market for these. People work not for its own sake but only to obtain goods and services that yield satisfactions. In an economy that practices division of labour and exchange, one does not obtain most of these goods and services directly by his own efforts. Rather one produces goods in which one's efficiency is relatively the greatest and exchanges the surplus above one's own use for the products of others. The very act of production, therefore, constitutes the demand for other goods, a demand equivalent to the value of the surplus goods each man produces. Each man's production (supply) constitutes his demand for other goods; hence, the aggregate demand must, in some sense, equal the aggregate supply. Total output may be limited by the fact that, at some point, for each individual, the satisfactions of a little more leisure will outweigh the sacrifice of little more goods that might have been obtained, but such unemployment will be voluntary, not involuntary.

Say's law holds good at any level of income, output or spending. What it implies is that any increment of output will generate an equivalent increase in income and spending. Thus income and spending can always be at full employment level. If they should be at a lower level, with some resources unwillingly idle, additional production will generate an equivalent amount of additional income, which will be expended in the purchase of the added products. And since no one will be content at the less than full employment, additional production will take place until the full employment is reached.

Say's Law is literally true in the barter economy. This is because one can supply a commodity to the market only as a demand for another commodity. But this Law holds good as well when goods are sold for money. The monetary theory contemporary of Say's Law, the Quantity Theory of Money, explains this.

In the money market the classical economists assumed the Quantity Theory of Money and argued that demand for money is only for transaction purpose and hence is dependent only on the level of income. Demand for money is, therefore, assumed to be a constant fraction of the national income. On the other hand, supply of money is assumed to be fixed at the constant level. The equilibrium in the money market where demand for money equals the supply of money, determines the equilibrium price level in the economy.

The quantity theory asserts that money determines only the price level, not the real output. The root idea of the quantity theory is that no rational person holds money idle, for it produces nothing and yields no satisfactions. Rather, people promptly use all the cash received from the sale of their goods and services to buy other goods and services. How

promptly that would occur, depends on how production is organized, how frequently incomes are paid and other institutional factors that were adjudged to be independent of the quantity of money and price level. Given these assumptions, the theory shows how the quantity of money determines the price level without having any influence on the real output.

Formally, we can state the quantity theory in any of several ways. We start with the two closely related formulations of the theory :

$$(1.1) \quad MV = P_t T \quad (\text{the } \mathbf{transactions} \text{ form})$$

$$(1.2) \quad MC = P_0 Y \quad (\text{the } \mathbf{income} \text{ form})$$

where M = quantity of money in circulation

V = transactions velocity of money

P_t = average price levels of all transactions

T = physical volume of transactions

C = income velocity or circular velocity of money

Y = real national product

P_0 = average price level of national product.

M is the total number of monetary units in private circulation. It is the sum of all of the individual balances of cash and deposits held at any given moment by businesses and individuals. V is the average number of times per year that units of money are used in any purchase-sale transaction. Individual units of money may turn over more slowly or rapidly, but, on the average, a unit of money changes hands V times per year. P_t is some price index which reflects changes in the average of prices at which transactions occur, appropriately weighted. T is the real or physical total volume of money-using transactions—either the total of all payments or of all receipts, corrected for changes in P_t —which occur during a year or other period : obviously, the same period as for V . $P_t T$ is then the money value of all transactions. C is the average number of times per year that units of money are used in a purchase-sale of final products. C is less than V as it ignores all turnovers of money in the purchase-sale of intermediate goods or productive services. Y is real national product, expressed per year, while P_0 is the national product deflator. $P_0 Y$ is then the money value of the national product.

Consider now the equation (1.1). Note that the product on each side of the equality sign is the same; it is the money value of total transactions during some specified period. On the left, this is measured by multiplying the number of units of money times the average number of times per period each unit is used in transaction; on the right, it is measured by multiplying the physical quantity of transactions by the price level.

V is assumed to be constant at its maximum feasible level, since no one ever holds an idle balance, that is, never holds a single unit of money longer than he needs to. The maximum level for V depends on structural and institutional factors unrelated to T, P_t , or M. Given a constant V, MV is proportional to M. Look at the other side of the equation. Assuming that prices are perfectly flexible, T can always be at the maximum level permitted by the technology and the willingness to work of the community. At any given time this maximum level of T can be taken as a constant. Hence, P_t must be proportional to M : increase in M by 10 percent would raise P_t also by 10 percent.

Consider now the equation (1.2). The equality holds because both sides of the equality sign measure money value of the national product during a given period. On the left, this is measured by multiplying the number of units of money by the average number of times per period each unit is used to buy final output. On the right, it is measured by multiplying the physical quantity of final output by its price level. C is assumed to be constant for the same reason as that of V. Here, we add the plausible assumption that, at any particular time, the volume of transactions in final output is some constant fraction of the volume of total transactions. Assuming competition and flexible prices, Y can be taken always to be at its maximum level, and P, therefore, proportional to M.

In the classical model, the interest rate is determined by the saving-investment equality. Savings, in the classical model, are assumed to be an increasing function of the interest rate, (i.e., as interest rate rises savings increase) while investment decreases with the rise in interest rate. The equilibrium interest rate, also known as the natural interest rate is the rate, at which savings equal investment.

So far we have analyzed how equilibrium output, real wage, price level and interest are determined in the classical model. With the equilibrium real wage already determined, now we can easily obtain the equilibrium money wage by multiplying the real wage rate with the price level (if real wage is given by W/P , then with the price level already determined, we can obtain the nominal money wage rate $W = (W/P)*P$).

Let us now look at the formal derivation of the classical model. The classical system can be represented by the following set of equations :

$$(1.3) \quad Y = F(N, K)$$

$$(1.4) \quad \delta F / \delta N = W/P$$

$$(1.5) \quad N^S = N^S (W/P)$$

$$(1.6) \quad N^D = N^S$$

$$(1.7) \quad M = kPY$$

where Y is aggregate production, N is labour and K is capital. N^S is supply of labour, W is money wage, P is price level and W/P is real wage and k is inverse of the velocity of money in circulation, (I/V) and is constant.

Equation (1.3) is aggregate production function where labour (N) and stock of capital (K) are two inputs. Capital is assumed to be fixed. With capital fixed we consider the change of output as total employment varies, asserting the condition

$$(1.4) \quad \delta F / \delta N = W/P$$

corresponding to the condition of maximum profit for the firm. It says that the aggregate marginal product should equal the economy-wise real wage. Note that $\delta F / \delta N > 0$ and $\delta^2 F / \delta N^2 < 0$. Equation (1.4) indicates the demand for labour (N^D). Equation (1.5) is the aggregate supply of labour N^S as the function of real wage W/P where the sign of the first derivative of this function is unknown $\delta N^S / \delta (W/P) > < 0$. The real system is completed by the prescription that equilibrium requires full employment :

$$(1.6) \quad N^D = N^S.$$

Note that we have five macroeconomic variables : Y , P , W , N and L but only four equations. To make the system determinate we need one more equation in these variables. It can be supplied by the quantity theory :

$$(1.7) \quad M = kPY$$

where k is taken as constant, or institutionally determined and M is (at any given time) fixed.

Now note that the real variables : Y , N^D , N^S and W/P are determined in the real sector. From (1.6) i.e. from the labour market equilibrium condition, real wage W/P is determined. Then either from (1.4) or (1.5) employment, N , is determined. Given the stock of capital (K), one can then determine the aggregate output (Y) from (1.3).

Real sector does not determine nominal variables P and W . For this the money market equilibrium condition is considered i.e. equation (1.7). Once Y is determined, we know P from this equation given M and k . Once we know P , we can determine the money wage rate, W , from the already determined real wage rate, W/P .

The point to note at this juncture is the fact that real and monetary sector in the classical system are completely detached. Money as such has no influence on output and employment determination. On the other hand, money price and wage rate are determined in the monetary sector from the money market equilibrium condition. Change in money stock does not have any impact on real wage rate and hence on employment and output.

This is due to the fact that increase in money stock would increase the price level by the same proportion. If W did not rise, real wage rate would fall. This would induce employers to try to increase output, bidding against each other for workers. Since no more workers are to be had, the money wage W must rise far enough to eliminate the excess demand for labour. The result of an increase in money supply is to raise wages and prices in equal proportion, leaving output, real wages and employment unaffected. You can work out the result of a decrease in M .

Classical concept of equilibrium output is full employment output. The output determination is consistent with the labour market equilibrium. Note that full employment in classical sense implies absence of any involuntary unemployment. Unemployment which exists even at the full employment level is voluntary in nature, implying that people voluntarily are not willing to offer their labour services at the going wage rate.

We can now illustrate diagrammatically the classical full employment equilibrium. This has been done in figure 1.1. Part (a) of the figure shows the aggregate production-employment relationship, or aggregate production function, subject to diminishing returns. For each level of labour input there is a corresponding total output. Part (b) shows the intersection of the demand for and supply of labour curves. The demand curve for labour, N , is derived from the slope of the aggregate production function in part (a) as demand for labour reflects the marginal product of labour from the aggregate employment-output relationship. The curve N represents the slope of the production function and declines as employment increases since production is subject to diminishing returns. The curve L represents the supply curve of labour which slopes upward as supply of labour increases as real wage rises. The intersection of the two curves in part (b) defines the point of full employment, N_0 , and the real wage $(W/P)_0$, which corresponds to full employment. Labour market equilibrium hangs on two crucial presumptions. Firstly, it is held that the labour market is characterized by perfect competition. This means that if real wage is greater (lower) than the full employment level real wage $(W/P)_0$, then excess supply of labour (excess demand for labour) will drive down (push up) the money wage to the full employment level. Hence, full employment equilibrium condition requires stability of money wage which depends on the labour market competition. Secondly, equilibrium condition requires stability of price level. Hence, stable money wage and price level are prerequisites of full employment real wage $(W/P)_0$. Equilibrium price level is determined in part (c). Here the straight line through the origin, kPY (whose slope is $1/k$) shows the amount of money required for each level of money income. Suppose, M_0 is the actual money stock shown

by the vertical line marked M_0 . Then, money income must be equal to $(PY)_0$. Since we know the equilibrium income Y_0 from part (a), we can immediately compute the equilibrium price level P_0 . Money wage is determined from part (d). Any real wage is a ratio of money wage to price level. Note that in part (d) we have plotted a diagonal line through the origin, whose slope is equal to the full employment equilibrium real wage rate $(W/P)_0$. Now, corresponding to this real wage rate there are numerous combinations of money wage (W) and price level (P). We have already determined the equilibrium price level in part (c). Given P_0 , from part (d) we immediately know the equilibrium money wage rate W_0 .

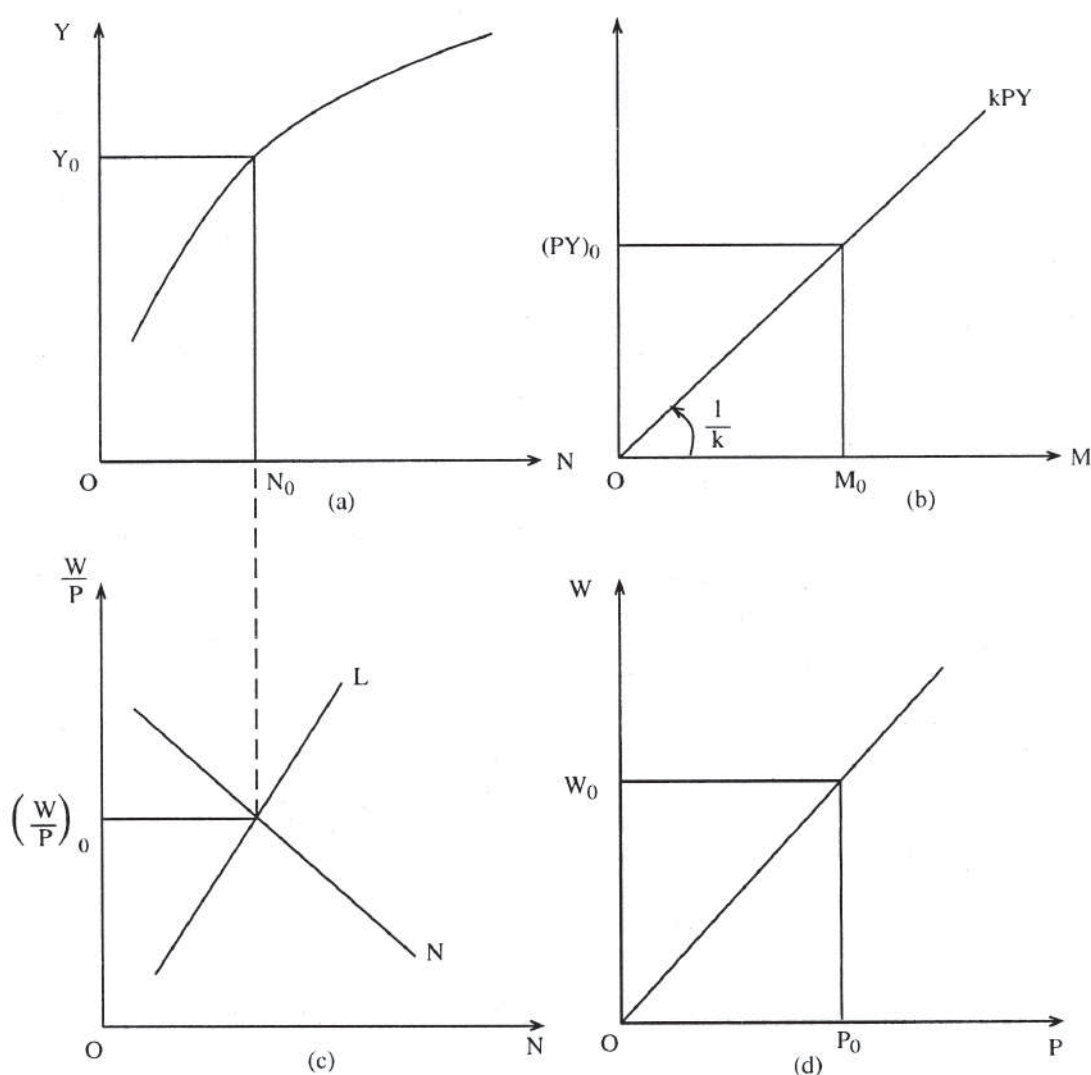


Figure 1.1

At the end, we refer to two notable features of the classical model :

Firstly, we have seen that in the classical model determination of real variables, like real wage, real income and real employment is independent of the quantity of money supplied in the money market. If there is any change in the money supply, then it would only lead to a change in the price level and money wage rate, keeping the real variables unchanged.

Secondly, in the classical model the investment and savings are assumed not to affect the real income. They only determine the equilibrium interest rate.

Thus we find that the wage-price flexibility always ensures equilibrium in the classical model thus disregarding any form of unemployment or under utilization of resources. If there is unemployment then it will immediately lead to a downward revision of wages thereby removing it. Similarly, if there is over production, then it will lead to reduction in the price level and an under production will, in turn, raise the price level.

Numerical example :

Let the supply equation of labour be : $L = 20 + 5 (W/P)$ (i)

Let the demand equation for labour be : $N = 80 - 10 (W/P)$ (ii)

Let the aggregate production function be : $Y = 8N - 0.05N^2$ (iii)

Let the stock of money be : $M = 100$ (iv)

If $k = 0.5$ then the quantity theory equation is : $M = 100 = 0.5PY$ (v)

The full equilibrium condition is $L = N$ (vi)

Substituting (i) and (ii) in (vi) we find the equilibrium real wage $(W/P) = 4$; and, substituting this real wage into either (i) or (ii) yields $N = 40$. Then, from (iii) substituting this employment we get $Y = 240$. Substituting this output in (v) we get $P = 0.833$ and substituting this price level into the real wage yields the money wage $W = 3.333$.

Note that now, if money supply is increased from 100 to 150 then the price level P would increase to 125 and W to 5. But no other real values would be affected. This is an illustration of classical dichotomy : dichotomy between real and monetary sector. Real variables are affected only through changes in real variables and not by any variation in the nominal variables.

(b) The Keynesian System

Until 1930, the classical system was accepted in the English speaking world. The Great Depression in 1929 brought out some glaring drawback of the system particularly pointing out the emptiness of the classical argument that the full employment level of output will always converge with the equilibrium level of output. Instead Keynes argued that wages and prices are not fully flexible and, in particular, there exists downward wage rigidity

which prevents the wage rate adjusting towards the full employment level. This may generate an unemployment in the economy which Keynes called the involuntary unemployment. The existence of involuntary unemployment as per Keynes was mainly due to the fact that the economy can attain equilibrium well before the full employment level is reached. Let us now look at some fundamental differences in the Keynesian analysis in comparison with the classicists. The major differences were mainly in three fields :

1. In the Keynesian analysis savings is not dependent on the rate of interest, but is dependent on the level of income. The level of consumption which can be obtained by subtracting the savings function from the income level is thus also determined by the level of income. If income increases both consumption and savings will increase.
2. The second important difference is in regard to the formulation of the demand for money function. Keynes assumes that money is mainly demanded for two purposes : (i) for transaction purpose and (ii) for speculative purpose. The transaction demand for money depends on the level of income just as it was in the case of classical model. The other component of the Keynesian demand for money is called the speculative demand for money which depends on interest rate negatively. In classical model it was argued that the people never hold idle cash balance because it yields nothing (except for transaction purpose). But, according to Keynes, people also demand money for speculative purpose. Keynes argued that bond prices and interest rates are negatively related and, therefore, a rise in the interest rate will mean that the price of the bond is expected to fall and hence people will be willing to hold more bonds. Thus we find that demand for holding idle money decreases with the rise in the interest rate. On the other hand, if the interest rate is low, then the people expect the future price of bonds to fall and hence in fear of making capital loss by buying bonds in the present period, they prefer to hold idle cash balance. Thus speculative demand for money is found to be negatively related to the rate of interest. Therefore, in the Keynesian model, demand for money is a function of both the interest rate and the income level.
3. The supply function of labour in the Keynesian system is totally different from the classical system. Keynes postulated that money wage is rigid and hence cannot fall below a fixed level. At the particular level of money wage number of workers who are willing to work irrespective of the change of the real wage rate determines the level of full employment. If the full employment level is crossed then the money wage must rise in order to increase the labour supply. But until the full employment level is crossed the rise in the labour supply will not be associated with the rise in wage rate.

However, the investment function in the Keynesian model is almost similar to that of the classical system except for the autonomous part now added to it. Thus, there is always a minimum level of investment in the economy, which is independent of the rate of interest. But the Keynesians like the classicists also assumed that the production function is dependent on the number of workers employed and the demand for labour is determined by the marginal product of labour.

From the above relations different equilibrium conditions in different markets can be easily obtained. In the commodity market, equilibrium is ensured by the equality between savings and investment. The equilibrium in the money market is ensured at the point where the demand for money equals the supply of money.

In the money market, money supply is exogenously determined by the monetary authority. The demand for money consists of transactions demand and speculative demand for money. Money market is in equilibrium when transaction demand and speculative demand equal the money stock exogenously determined.

In the labour market the interaction between demand for and supply of labour produces another set of real income (determining the wage rate) along with the equilibrium level of employment. But in order to maintain the overall equilibrium in the economy both this real income (one obtained from the interaction of the product market and the money market, while other obtained from the labour market) must match each other. Keynes has shown any discrepancy in this matter will automatically be resolved via the change in the price level. If the equilibrium level of income obtained from the commodity and the money market is higher than what is obtained from the labour market, then it would imply that there is excess demand and hence will pull the price level upward until the real income obtained from both the markets become equal. The mechanism behind this is as follows : In the labour market, a rise in price level will reduce real wage and hence increase employment which will increase income level. Whereas in money and commodity market a rise in price level will increase the transaction demand for money (with money supply unchanged), which will, in turn, increase speculative balance, thus raising the interest rate. This rise in the interest rate will, in turn, reduce the income level. This price rise will continue until the real income obtained from both the markets become equal. If the level of income obtained from the commodity market is less than the real income determined from the labour market then it would imply an excess supply situation and thus there will be continuous fall in the price level until both the markets come back to the equilibrium position.

Thus via the above adjustment mechanism the interaction among the various macro economic variables will bring the economy to its overall equilibrium position. Thus compared to the classical system we find that in the Keynesian system both the monetary

and non-monetary variables can be determined simultaneously. This marks the departure from the classical dichotomy. A change in the supply of money will affect all the variables like income, employment, interest rate and price level, thus moving the economy towards new level of equilibrium. The equilibrium can be attained even when full employment is not reached.

The Keynesian system can now be described with the help of the following sets of equations :

$$(1.8) \quad Y = F(N, K)$$

$$(1.9) \quad N^D = N^D(W/P)$$

$$(1.10) \quad N^S = N^S(W/P)$$

$$(1.11) \quad N^D = N^S$$

$$(1.12) \quad W = W^*$$

$$(1.13) \quad M = kPY + f(i)$$

$$(1.14) \quad S = S(Y, i)$$

$$(1.15) \quad I = I(i)$$

$$(1.16) \quad S = I$$

where Y is aggregate production, N is labour and K is capital. N^S is the supply of labour, W is money wage, P is price level and W/P is real wage, M is money stock, k is inverse of the velocity of money in circulation, i is interest rate, S denotes savings and I denotes investment.

Equation (1.8) is the aggregate production function where labour (N) and stock of capital (K) are two inputs. Capital is assumed to be fixed. With capital fixed we consider the change of output as total employment varies, asserting the condition $\delta F / \delta N = W/P$ corresponding to the condition of maximum profit for the firm. It says that the aggregate marginal product should equal the economy-wise real wage. Note that $\delta F / \delta N > 0$ and $\delta^2 F / \delta N^2 < 0$. Equation (1.9) indicates the demand for labour (N^D). Equation (1.10) is the aggregate supply of labour N^S as the function of real wage W/P where the sign of the first derivative of this function is unknown $dN^S/d(W/P) > < 0$. Labour market equilibrium condition is given by (1.11). Note that money wage W cannot go down institutionally fixed money wage rate W^* as shown by the condition (1.12). Hence, equilibrium in the labour market here does not mean full employment. Rather, it indicates employment level corresponding to the given money wage rate.

Equation (1.13) shows the money market equilibrium condition. The right hand side of the equation shows the money demand function. The first component on the right hand side is the transaction demand for money, kPY. The second component is the speculative demand for money, f(i). M here indicates the money stock.

Equation (1.14) shows the savings function and equation (1.15) shows the investment function. The commodity market equilibrium condition is indicated by the savings-investment equality condition as indicated by the equation (1.16).

Note that the system is determinate and equilibrium that occurs is less than full employment equilibrium. Because the labour market does not clear due to the downward rigidity of money wage as indicated by the condition (1.12). There remains excess supply of labour, which indicates involuntary unemployment at the equilibrium. Employment here is labour-demand determined. Once employment is determined, output Y is determined from equation (1.8). Savings investment equality condition determines the interest rate i from (1.16) given that income Y is already determined. Then from (1.13) the equilibrium price level P can be determined given the money stock M and given also that the income Y and interest rate i are already determined.

The Keynesian equilibrium is now illustrated diagrammatically in the figure 1.2 below.

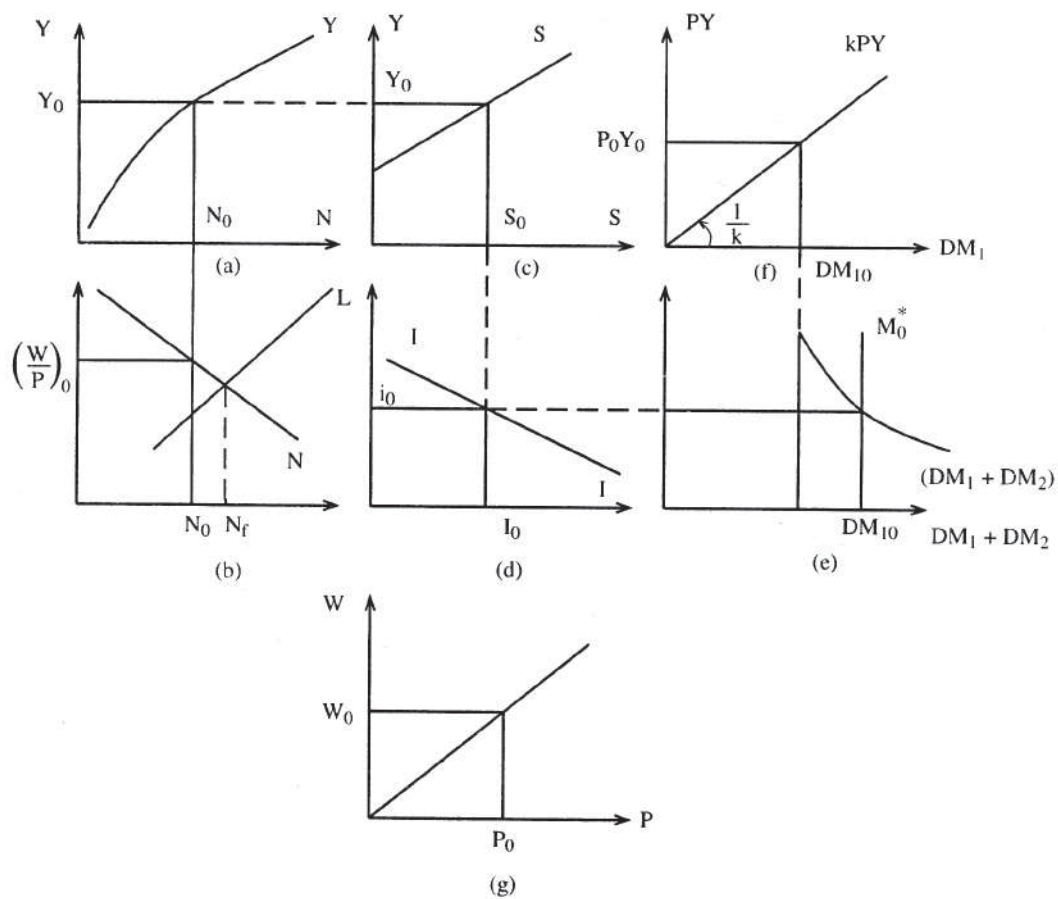


Figure 1.2

Part (a) of the figure shows the aggregate production function. Part (b) shows the demand for and supply of labour curves. The labour demand curve is the slope of the aggregate production function and decreases as real wage increases. The labour supply curve is increasing with real wage. Note that the equilibrium level of employment N_0 is less than the full employment level N_f , where labour demand and supply curve intersect. From part (a) then output or income Y_0 consistent with the equilibrium employment level N_0 is determined. Part (c) shows the savings function. It indicates savings as a function of income Y given the interest rate. Then from part (c) we can determine the savings S_0 consistent with the equilibrium income Y_0 . Part (d) shows the investment function which decreases as interest rate rises. Equality of savings and investment in part (d) determines the equilibrium interest rate i_0 . Part (e) shows the money demand function. Given the money stock M_0 we can find the money market equilibrium condition, which enables us to determine the transaction demand for money DM_0 at equilibrium. Then, from part (f) using the diagonal line kPY from the origin, whose slope is $1/k$, equilibrium money income $(PY)_0$ is determined. Since Y_0 is already determined we can now immediately find the equilibrium price level P_0 .

Numerical Example :

Let the demand for labour equation be $N = 80 - 10(W/P)$. Let the money wage rate be $W = 5$. Then, we have $N = 80 - 50/P$. Let the production function be $Y = 8N - 0.05N^2$. Substituting the expression for N , we get $Y = (80 - 50/P) (4 + 2.5/P)$.

Let the money stock $M = 100$, and the money market equilibrium condition be $M = 100 = 0.5PY + 50 - 0.5i$. This equation can be written as $0.5PY - 0.5i = 50$. Now, substituting the expression for Y we get :

$$0.5P(80 - 50/P) (4 + 2.5/P) - 0.5i = 50 \quad (i)$$

Let the savings equation be $S = 100 + 0.5Y + 0.5i$ and the investment equation be $I = 100 - 0.5i$. The savings-investment equality $S = I$ yields :

$$0.5(80 - 50/P) (4 + 2.5/P) - i = 0 \quad (ii)$$

Solving (i) and (ii), we get $P \approx 1$.

Then, from the expression for N we get $N = 30$. Note that this is less than the full employment $N_f = 40$. The full employment can be derived from the equality of labour demand and supply equations. We get $N_f = 40$ if labour supply equation is $L = 20 + 5(W/P)$. Then putting this value of N in the expression for Y we get the equilibrium income $Y = 235.5$. Lastly, putting this value in the money market equilibrium condition we get $i = 13.55\%$.

Complete Keynesian System (IS-LM Framework) :

The IS-LM model emphasizes the interaction between goods and assets markets. The Keynesian analysis takes note of aggregate demand in a capitalist economy in the short run. Aggregate demand (AD) consists of the demand for consumption (C), investment (I) and government spending on goods and services (G). In terms of the Keynesian analysis, demand for consumption is a function of (disposable) income. Investment demand depends on rate of interest in the economy. Goods market will be in equilibrium if aggregate demand (AD) is equal to the produced output (Y), $Y = AD$. This, in other words, implies the following equality.

$$(1.7) \quad Y = C + I + G$$

$$(1.18) \quad C = a + b(1 - t)Y$$

$$(1.19) \quad I = c - di$$

$$(1.20) \quad G = G^*$$

where $(1 - t)Y$ is disposable income with t being the tax rate, a is autonomous consumption expenditure which does not depend on income, b is the marginal propensity to consume, c is autonomous investment expenditure, i is the interest, G^* is fixed government spending.

Now, substituting for C , I and G into (1.17) we obtain :

$$(1.21) \quad Y = A + b(1 - t)Y - di$$

where $A = a + c + G$.

From (1.21) we get the equilibrium output as

$$(1.22) \quad Y = \alpha(A - di)$$

where $\alpha = 1/1 - b(1 - t)$ is the Keynesian multiplier. It shows to what extent income increases due to one unit increase in investment expenditure. Note that the equilibrium condition (1.22) is the goods market equilibrium condition. Equation (1.22) can be diagrammatically expressed in terms of a locus of points showing combinations of income and interest rate for which goods market will be in equilibrium. This is shown in figure 1.3. The curve labeled IS is the locus of combinations of interest rate and income for which goods market will be in equilibrium. It is negatively sloped because a higher level of interest rate reduces investment spending, therefore, reducing aggregate demand and thus the equilibrium income. The steepness of the curve depends on the interest rate sensitivity of investment, d , and the multiplier α . IS curve is shifted by changes in autonomous spending. For example, increase in government spending shifts the IS curve to the right. At points to the right of the IS curve, there is excess supply in the goods market and at points to the left of the curve, there is excess demand for goods.

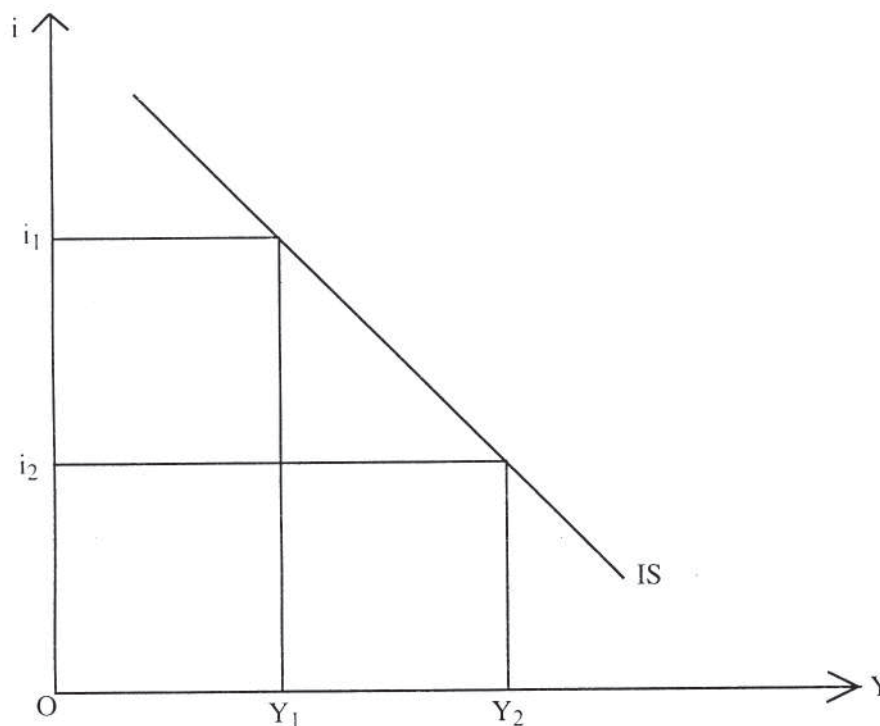


Figure 1.3

Now, let us turn to the asset markets. Asset markets are the markets in which money, bonds, stocks, houses and other forms of wealth are traded. We shall simplify by grouping all available financial assets into money and interest-bearing assets. Following Keynes, the demand for real balances consists of transaction and precautionary demand on the one hand and speculative demand on the other hand. Transaction and precautionary demand for real balances depends on money income (PY) where P and Y stand for the price level and real income respectively. Speculative demand for real balance depends on interest rate. With the rise in interest rate speculative demand for real balance decreases as the opportunity cost of holding money increases when interest rate rises. The opportunity cost of holding money is the foregone interest earnings from the interest-bearing assets. The demand for real balances is accordingly written :

$$(1.23) \quad L = kY - hi, \quad k > 0 \text{ and } h > 0.$$

Now, the money market will be in equilibrium if demand for real balance is equal to the supply of real balance. Money supply (M) is exogenously fixed by the monetary authority. Then the supply of real balance is M^*/P where M^* is the fixed money supply and P is the price level. Then the money market equilibrium condition can be written as :

$$(1.24) \quad M^*/P = L$$

From (1.24) substituting for L we obtain :

$$(1.25) \quad i = 1/h(kY - M^*/P)$$

Equation (1.25) depicts the relationship between interest rate and income consistent with money market equilibrium, given the money supply, price level, interest-sensitivity of money and velocity of circulation of money. This relationship is expressed diagrammatically with the help of the locus of points indicating the combinations of interest rate and income, which would ensure money market equilibrium. This is shown in figure 1.4 by the curve labeled LM, which is positively sloped. An increase in the interest rate reduces the demand for real balances. To maintain the demand for real balances equals to the fixed supply, the level of income has, therefore, to rise. Change in money supply shifts the LM curve. An increase (decrease) in money supply shifts it right (left). At points to the right of the LM curve, there is an excess demand for money and at points to its left, there is an excess supply of money.

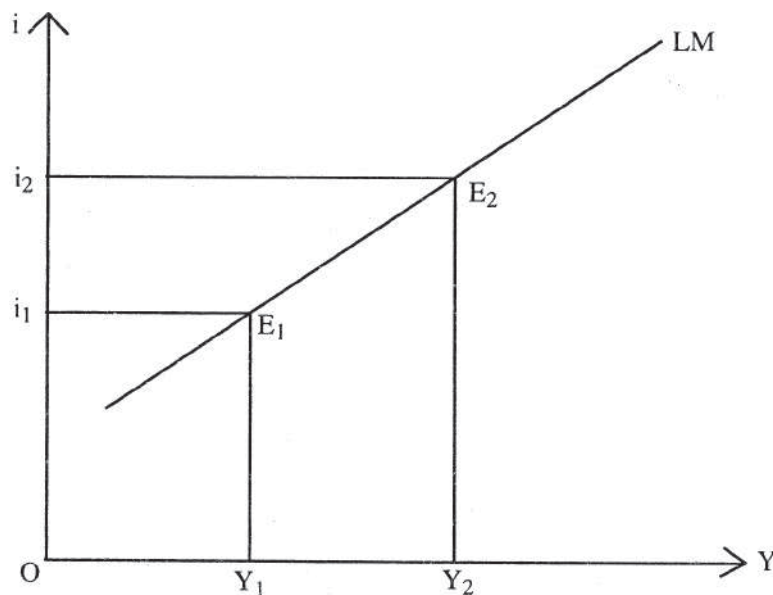


Figure 1.4

We are now ready to discuss the joint equilibrium of the goods and assets markets. The conditions that have to be satisfied for the goods and money markets respectively, to be in equilibrium are summarized by the IS and LM schedules. The task now is to determine how these markets are brought into simultaneous equilibrium. For simultaneous

equilibrium, interest rates and income have to be such that both the goods and money market are in equilibrium. The condition is satisfied at the point of intersection of the IS and LM curves, point E in the figure 1.5 below. The equilibrium interest rate is i_0 and the equilibrium level of income is Y_0 , given the exogenous variables, in particular the real money supply and fiscal policy reflected in terms of government spending. Note that in the IS-LM framework the major assumption is that the price level is constant and that firms are willing to supply whatever amount of output is demanded at that price level.

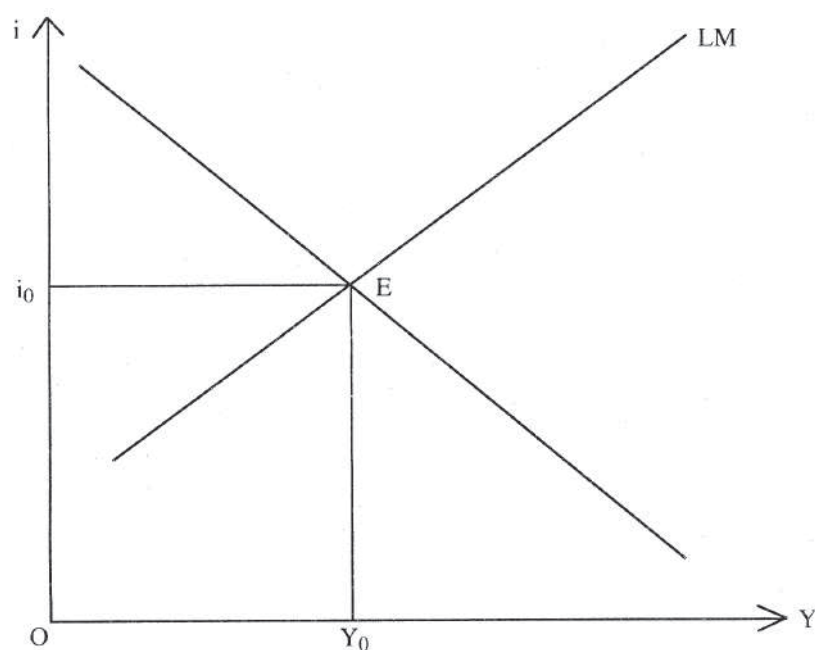


Figure 1.5

(c) The Monetarism

Monetarism is a modern variant of the classical macroeconomics. It emerged in the United States in the period since World War II. Professor Milton Friedman is the founder of this doctrine. Monetarism is the view that the money supply is the principal determinant of the levels of output and employment in the short run and the price level in the long run. It is based upon the monetarist conceptions of the demand for money and the transmission mechanism.

According to Friedman, money is one way of holding wealth. Wealth can be held in other forms : bonds, equities, physical non-human goods and human capital. The demand for money thus depends on the tastes and preferences of the wealth-owning units, the total

amount of wealth to be held in the various forms, and the price of, and returns to, the various forms of wealth. Specifically, the real amount of money demanded depends on the bond interest rate, the interest rate on equities, the expected rate of inflation, wealth (defined so as to include human wealth), the ratio of non-human to human wealth and any variables that can be expected to affect tastes and preferences. If wealth increases, more money is demanded. If either the bond or equity interest rate increases, society will demand less money since bonds or equities are now more attractive to hold than money. Similarly, if the rate of inflation rises, it becomes relatively more expensive to hold money as it depreciates in value with inflation. Consequently, if the expected inflation rate rises, the real amount of money demanded will be reduced. The ratio of non-human to human wealth and the variables which affect tastes and preferences are assumed constant in the short run.

Friedman's demand for money function is important, because with an increase in the money supply various portfolio adjustments occur. These adjustments are crucial to the monetarist view of the transmission mechanism.

In most versions of the IS-LM model, the money supply is assumed to affect income through the interest rate and investment. Monetarists claim that adjustment takes place over a broad range of assets and that the IS-LM framework is too narrow to capture the essence of the adjustment process. As a consequence, they offer an alternative view of the adjustment or transmission mechanism.

Suppose the monetary authority increases the money supply through open market purchases of the government securities. According to Friedman, the effects are twofold : the price of the securities increases, thereby reducing the yield, and the composition of the public's portfolio is altered. The public now holds more money and fewer securities. Since the public does not want to hold this much money, individuals try to rearrange their portfolios so as to reduce their money holdings. Suppose they first attempt to purchase marketable securities. As the purchases take place, security prices increase and yields decrease. Consequently, the demand for other assets, including equities and real assets such as houses and land increases. With the increase in demand, the prices of these assets increase, thus stimulating production of real assets. Consequently, the demand for resources used in their production increases. Moreover, increases in price of these assets imply that the price of these assets is higher relative to the prices of services. For example, it is now relatively less costly to rent an automobile than to buy one. Thus, the demand for services increases.

An increase in the money supply results in increased expenditures for financial and real assets and for services. The increases in expenditures include increased spending for both investment and consumption. The transmission mechanism may be described as operating through interest rates. But for this a much broader range of interest rates must be considered than is usually considered in the Keynesian model. An increase in money supply ultimately leads to a significant increase in both output and the price level. In the long run, it affects mainly the price level. Friedman believes that the long run growth rate of output is determined by real factors, such as the saving and the structure of industry. Thus, in the long run, more rapid increases in the money supply result in higher rates of inflation, not higher growth rates of output.

Based upon their view of the transmission mechanism, monetarists regard monetary policy as very powerful. At the same time, they regard fiscal policy, unless accompanied by a change in the money supply, as ineffective. In contrast, Keynesians, although conceding the effectiveness of monetary policy, maintain that fiscal policy, even in the absence of a change in the money supply, is effective.

In the Keynesian model, interest rate is assumed to fall in response to an increase in the money supply. In contrast, Friedman and other monetarists argue that the interest rate may rise. Initially, the interest rate may decline. With the increase in money supply, aggregate demand increases and hence, income increases. This raises the real amount of money demanded. Also, with the increase in the aggregate demand price level increases, thus reducing the real money supply. These effects, Friedman claims, will reverse the initial downward pressure on interest rates in less than a year. After a year or two, these forces will return interest rates to their original level. Given the tendency for the economy to overreact, the forces are likely to raise interest rates temporarily above their original levels. If people expect more inflation to prevail, interest rates will rise above their original equilibrium levels. This is substantiated by Friedman with the help of the relationship between interest rates and the expected rate of inflation postulated by Irving Fisher :

$$i = i_r + (\Delta P/P)^E,$$

where i is observed as nominal interest rate, i_r is the real interest rate and $(\Delta P/P)^E$ the expected rate of inflation. Friedman argues that changes in the price expectations are slow to develop. If money supply increases more rapidly for a prolonged period, prices would increase more rapidly. As people revise their expectations about inflation upward, the higher rate of monetary expansion will lead to higher interest rates.

Keynesians hold that a free enterprise economy needs to be stabilized, since the discretionary policy is stabilizing. Monetary and fiscal policy should be used for that purpose. In contrast, monetarists believe that there is no serious need to stabilize the economy; even if there were, discretionary policy should not be used since it is destabilizing. Discretionary policy should not be used since it is destabilizing. Discretionary policy is used to alter the economic growth and employment. By and large, monetarists believe that the economy tends to adjust until full employment prevails. For this reason they think discretionary policy is unnecessary. On the other hand, Keynesians believe that discretionary policy is necessary to attain full employment as the economy does not automatically gravitate to full employment.

(d) New Classical Macro Economics

Around 1970 a new macro economics school emerged, which came to be known as the new classical school. This school is based mainly on the supply side economics. This school included some of the prominent members like Robert Lucas, Thomas Sargent, Edward, Prescott etc., who mainly tried to put forward an economic theory which differs significantly from the Keynesian school. The two main tenets of the new classical macro economics are the rational expectation theory and the efficient market clearing argument. Apart from these two assumptions the new classical economists also believe that the economic agents always maximize provided with a given situation.

Below we have discussed briefly some of the important features of the new classical school.

- (1) The proponents of the new classical school argue that all economic agents make optimal decisions by using all the available information. Thus the decision made is supposed to be the best and it maximizes individual utility.
- (2) New classical economists believe that individuals formulate expectation, by efficiently using all the relevant information available to them about the future. This suggests that individuals do not make any mistake or errors while forecasting and their guesses about the future are, on average, correct. Thus, the proponents of the theory assume that people are rational. The new classical theory is also called the rational expectation model. The hypothesis of the rational expectation has three important implications for macro economic analysis.
 - (i) According to the rational expectation theory there exists no trade off between inflation and unemployment as was suggested by Phillips, even in the short run. (Monetarists proposed that in the short run a trade off between inflation and unemployment exists). A. W. Phillips indicated that there would be trade off between the ratio of change of money wage rate and the unemployment rate. Lower unemployment was assumed to

be obtained at the cost of higher inflation rate by effective increase in aggregate demand. But the proponents of rational expectation theory argue that any increase in the inflation rate will be immediately realized by the workers and hence will lead to spontaneous adjustment in their wage rate. Similarly, businessmen will also realize the increase in inflation rate hence will adjust the prices of their products accordingly. Therefore, any change in a policy like increasing money supply will not affect output or employment in any way. So according to the proponents of the rational expectation even though rate of inflation increases, it will not affect the unemployment rate by any means and hence there will be no trade off between inflation and unemployment.

- (ii) The proponents of new classical school argue that any kind of discretionary policy taken by the government will not affect output and employment in the economy. For example, an increase in government spending, say, by Rs. 100 crores, would immediately be anticipated by businessmen and workers and hence a spontaneous adjustment in the money wage rate and price level will take place. But no change will be observed in the level of output and employment.

However, if a change in government policy is not anticipated by the people then it may eventually lead to change in the output and the employment level. For example, if the increase in the government purchases was unanticipated, it would have increased both output and employment. But eventually when the household and firm come to anticipate the change in the policy, they will revise their expectation of wages and price sending the output and employment back to the initial equilibrium level.

- (iii) Another important tenet of the new classical economists is that they assume markets always clear. According to them, wages and prices are fully flexible and always adjust to equate demand and supply in various markets. Thus, from this fact it can be said that there is no scope for existence of involuntary unemployment in a new classical framework. Any unemployed person who really wants a job will always offer to cut his or her wage, until the wage is low enough to attract an employment offer from the employer. Similarly, any businessman with excess supply of goods will cut back prices of the goods. Thus this flexible adjustment always ensures that markets should always be in equilibrium.

The alleged fact that output and employment fail to change in response to anticipated changes in fiscal and monetary policy does not mean that they are constant over time. If the changes are unanticipated, output and employment will be altered. Unanticipated changes in aggregate supply or demand refers to shocks in new classical economics. The huge increase in crude oil prices in 1973-74 was a supply shock.

Since output and employment change in response to shocks, it is very tempting to argue that discretionary policy would work. According to the rational expectations theory, discretionary policy would not be successful in stabilizing the economy. In fact, the proponents of the theory argue that discretionary policy designed to offset shocks may generate errors in expectations, which will lead to greater fluctuations in output and employment. Thus, advocates of the rational expectation approach argue that monetary and fiscal policies should be designed so as to minimize uncertainty. For example, they favour increasing the money supply at constant rate.

Opponents of the rational expectations school offer three major criticisms. First, they note that if policy makers have more information about the economy or their own actions than does the general public, policies can be devised that can alter output and employment.

A Second criticism of the rational expectation theory has to do with the assumption of wage price flexibility. But they may be sticky. As a consequence, even if expectations are formed rationally, money wages and prices may adjust slowly, resulting in changes in output and employment. Hence, the critics argue that discretionary policy would work even if expectations are formed rationally.

Finally, it is held that the rational expectations theory fails to explain the prolonged period of unemployment that we sometimes observe. If expectations are rationally formed and if wages and prices are flexible, they claim that deviations from the equilibrium levels of output and employment should be short-lived. Since this implication appears to be inconsistent with actual experience, many critics reject the theory on this basis.

Supply-Side Economics

Supply side economics is another variant of new classical economic thought. The proponents of this approach argue that the best way to improve the economic performance of a country is to undertake policies designed to increase aggregate supply of goods and services. Thus, they favour sharp reductions in tax rates, which they believe, will provide greater incentives to work, save and invest. This view gained momentum in the United States in the early 1980s after Ronald Reagan became the President. That is why it is also called Reaganomics.

According to supply-side economics, taxes drive a wedge between the price a buyer must pay and the price the seller receives. High marginal tax rates discourage savings and encourage consumption. The advocates of this approach believe that entrepreneurs will have greater incentives for investment if personal income tax rates are reduced. The basic argument of the supply-side economics is that reduction in all types of taxes would stimulate aggregate supply in an economy and thereby would generate rapid economic growth.

There are three major criticisms against supply-side economics. First, the critics claim that even if a relatively large decrease in tax rates were to occur, the resulting increases in labour supply, savings and investment will be very modest, especially in the short run. Second, even if aggregate supply increases, aggregate demand will increase even more rapidly, resulting in a higher rate of inflation. Third, if contractionary monetary policy is used to reduce the rate of increase in aggregate demand, the consequent higher interest rates will discourage investment.

1.4 Implications of these Theories for LDCs

LDCs are characterized by both demand deficiency and supply side bottlenecks. No one theory discussed in the previous section is fully applicable here.

If we consider the classical paradigm then full employment equilibrium is a far cry. Wage price flexibility postulates are not relevant in the context of the LDCs. Due to the underdevelopment of money market it cannot be said that money supply growth will lead to output growth as suggested by the monetarists. The presumption of new classical school that people are rational and hence, they form rational expectation is not tenable. In all these theories, except that of Keynes, the role of the state is undermined. In that sense, Keynesian presumption in terms of expansionary Fiscal and Monetary policy-led economic growth has got some relevance in the LDCs context.

1.5 Let Us Sum Up

We have learnt that a paradigm is a dominating principle and there are quite a few paradigms in economics. There are several competing paradigms in macro economics also, such as classical, Keynesian, Monetarism and new classical. The classical idea is based upon Say's Law, which states that supply creates its own demand and self equilibrating market mechanism automatically ensures full employment equilibrium. Keynes ruled out wage price flexibility. Due to downward rigidity of wages, equilibrium can take place at the underemployment level. Keynes put main emphasis on the role of aggregate effective demand in explaining the functioning of capitalist economy. Monetarists stressed on the rule of money in fostering economic growth. New classical economics hold that individuals be rational and maximize their utility. So with full price flexibility there is no role of government policy action on the economy.

These theories do not hold good in totality for LDCs as the principal assumptions of classical or monetarists as well as new classical school widely differ from the LDC reality.

In some sense, Keynesian policies are relevant as it focuses on demand deficiencies from which LDCs mostly suffer.

1.6 Questions

- (i) What do you mean by a paradigm?
- (ii) Describe the classical system.
- (iii) Describe the Keynesian system.
- (iv) Distinguish between classical and Keynesian system.
- (v) What is monetarism? What are its main features?
- (vi) Briefly describe new classical thought.
- (vii) Briefly comment upon the implications of various economic paradigms on LDCs.
- (viii) What is supply-side economics? What are the main arguments against this view?
- (ix) Describe the complete Keynesian system.
- (x) The following equations describe an economy :

$$C = 0.7(1 - t)Y$$

$$t = 0.20$$

$$I = 800 - 40i$$

$$\bar{G} = 600$$

$$L = 0.25Y - 32.5i$$

$$\frac{\bar{M}}{P} = 500$$

- (1) What is the equation that describes the IS curve?
- (2) What is the equation for the LM curve?
- (3) Find out the equilibrium levels of income and interest rate.

1.7 References

Mankiw, N. Gregory, *Macroeconomics*, fifth edition, Worth Publisher, 2003.

Dornbusch, Rudiger and Fisher, Stanly, *Macroeconomics*, Fourth edition, Mc-Graw Hill International Editions, 1987.

Unit 2 □ Basic Macroeconomic Problems

Structure

2.0 Objectives

2.1 Introduction

2.2 Inflation and Unemployment—Short run and long run Phillips Curve

2.2.1 What is inflation?

2.2.2 Is there Inflation and Unemployment trade-off?

2.2.3 The Short run Phillips Curve

2.2.4 The Long run Phillips Curve

2.3 Money, Inflation and Unemployment

2.4 Stagflation

2.4.1 Causes of Stagflation

2.5 Expectations augmented Phillips Curve

2.6 The Political Economy of Inflation and Unemployment

2.7 Let Us Sum Up

2.8 Questions

2.9 References

2.0 Objectives

By the time you have studied this unit you should be able to :

- Explain the concept of inflation.
- Analyse the relationship between inflation and unemployment.
- Explain the notion of the Phillips curve.
- Explain stagflation and its causes.
- Explain the role of expectations in inflation and unemployment trade-off.
- Analyse the policy debate concerning inflation and unemployment.

2.1 Introduction

In this unit, we will deal with one of the major issues of economic theory : the trade-off between inflation and unemployment. From the 1950s this issue regarding negative

relationship between inflation and unemployment became popular. The Phillips curve that economists use today, differs in three ways from the relationship Phillips himself examined.

First, the modern Phillips curve substitutes price inflation for wage inflation. This difference is not crucial because price inflation and wage inflation are closely related.

Second, the modern Phillips curve includes expected inflation. This addition is due to the work of Milton Friedman and Edmund Phelps.

Third, the modern Phillips curve includes supply shocks. Credit for this goes to OPEC, the Organization of Petroleum Exporting Countries. In 1970s OPEC caused large increase in the world prices of oil, which made economists more aware of the importance of shocks to aggregate supply. We will analyze both the short run and long run view of the Phillips Curve. Then we will discuss the causes of stagflation. Next, we will analyze the importance of forming expectation regarding inflation, where we will mainly discuss the adaptive expectation model and the long run expectation augmented Phillips Curve. At the end, we will discuss the political economy of the Phillips Curve dwelling on the different policy options to contain both inflation and unemployment.

2.2 Inflation and Unemployment : Short Run and Long Run Phillips Curve

The relationship between inflation and unemployment has drawn considerable interest among economists throughout the world over the last fifty years or so. A noted British economist, A.W. Phillips, published an article in 1958 using historical data on the rate of wage inflation and unemployment rate of the U.K. during 1861-1957 in which he showed that there, in fact, existed an inverse relationship between the rate of wage inflation and the rate of unemployment. The original Phillips curve was a relationship between unemployment and the rate of wage increase. However, the rate of wage increase had long been taken to be the primary determinant of the rate of price increase (or vice versa), so that a Phillips curve could easily be restated as a relationship between unemployment and the rate of price inflation. This inverse relationship implies that for reducing unemployment price in the

form of a higher rate of inflation has to be paid, and for reducing the rate of inflation, price in terms of a higher rate of unemployment has to be borne. On graphically fitting a curve to the historical data, a downward sloping curve exhibiting the inverse relationship between the rate of inflation and the rate of unemployment was obtained. This trade-off is known to exist in the short run only, not in the long run. Figure 2.1 shows the short run Phillips curve.

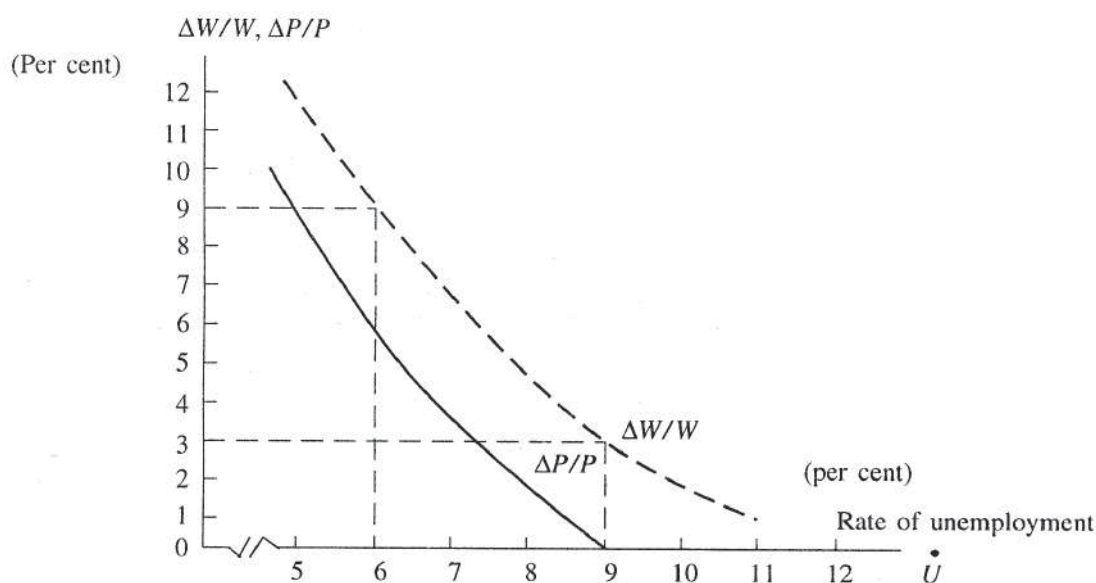


Figure 2.1

2.2.1 What is Inflation?

Inflation is commonly defined as a significant and sustained increase in general price level. It is not just high price but continuously rising price that constitutes inflation. Thus inflation is an explicitly dynamic process. Inflation is an important indicator of macro economic stability.

The rate of inflation, the percentage change in the overall level of prices, varies greatly over time and across countries. In the United States, according to the consumer price index, prices rose on an average of 2.4 per cent per year in the 1960s, 7.1 per cent per year in the 1970s, 5.5 per cent per year in the 1980s and 3 per cent in the 1990s. In some countries rate of inflation was much higher than these figures. A classic example is Germany in 1923, when prices rose on an average of 500 per cent per month. This is a case of what is called hyperinflation. Table 2.1 indicates the five year average rate for India.

Table 2.1

Five year Average Annual Inflation Rate

Period	52 week annual average	Point to pint (Month end)
1950—57 to 1960—61	6.3	5.2
1961—62 to 1964—65	5.8	5.9
1965—66 to 1970—71	6.7	5.7
1971—72 to 1976—77	12.0	10.8
1977—78 to 1980—81	8.5	11.0
1981—82 to 1985—86	6.5	5.5
1986—87 to 1990—91	7.8	8.5
1991—92 to 1995—96	10.6	9.3
1996—97 to 2000—01	5.0	5.3

*Source : Economic Survey, Government of India***2.2.2 Is there an Inflation Unemployment Trade-off?**

Ever since the late 1950s, economists, policy makers and politicians have speculated and argued about the existence of a trade-off between inflation and unemployment. Many have claimed that it is possible to reduce unemployment if we are willing to tolerate higher rates of inflation. Conversely it is often claimed that inflation can be reduced only by incurring higher rates of unemployment. The implication is that there exists a trade-off—we can have less unemployment for more inflation or less inflation for more unemployment. The graphical representation of this trade-off is known as the Phillips curve which we have already seen.

2.2.3 The Short run Phillips Curve

This Phillips Curve is downward sloping from left to right, suggesting that there is a trade-off between inflation and unemployment. Originally, the Phillips Curve was constructed in terms of negative relationship between the rate of increase in wage rate $\left(\frac{\Delta W}{W}\right)$ and unemployment rate (U). Now there is a direct relationship between the inflation rate and wage rate. For example, everything being equal, if initially money wage rate increases by

7% per year and labour productivity by 3% per year, then the price level will increase by 4%, i.e. there will be 4% inflation rate. A rise in the money wage rate from 7% to 9% per year with no change in the 3% growth rate of labour productivity will tend to raise the inflation rate from 4% to 6%.

Then a rise in the wage rate without increase in productivity will have direct effect on inflation rate. Now, if in addition to this direct effect between the rate of wage increase and the price increase, there is also an inverse relationship between the rate of wage increase and rate of unemployment, then it follows that there is an inverse relationship between the inflation rate and the unemployment rate. This analysis of the particular relationship between the rate of increase in price and the unemployment rate is shown in the short run version of the Phillips Curve. In figure 2.1, we have already plotted the short run Phillips Curve.

Both the rate of change of wage rate ($\Delta W/W$) and the rate of inflation ($\Delta P/P$), are measured along the vertical axis. The rate of unemployment (U) is measured along the horizontal axis. The upper curve relates $\Delta W/W$ to U , and the lower curve relates $\Delta P/P$ to U , which is based on the assumption of 3% increase in labour productivity per year. The relationship between the wage rate and the unemployment rate assumes that $\Delta W/W$ will be 3% per year if U is 9%. Accordingly, the Phillips Curve reveals that $\Delta P/P$ will be zero, or the price level will be stable if U is 9%. Again, if $\Delta W/W$ is 9% with U of 6%, $\Delta P/P$ is 6% with U of 6%. Thus from this analysis we can easily observe that there is a negative relationship between the unemployment rate and the rate of change in wage rate which, in turn, indirectly shows the negative relationship between the rate of change in inflation and unemployment.

2.2.4 Long Run Phillips Curve

During the sixties the Phillips Curve became an important concept of macro economic analysis. The stable relationship described by it suggested that policy makers could have a lower rate of unemployment if they could bear with a higher rate of inflation. But a stable Phillips Curve could not hold good during the later decades, especially in the United States. Since the oil price shock in early seventies we actually have periods when rate of both inflation and unemployment increased implying high rate of inflation along with high unemployment rate. The trade-off between the two rates was missing.

2.2.5 Causes of Shift in Phillips Curve

The absence of trade-off between the rate of inflation and unemployment can actually be explained by the adverse supply shocks in the form of fourfold increase in the prices

of oil and petroleum products. A supply shock causes the cost of production to rise, and hence, producers will now charge higher price to cover higher cost. There is then contraction in the aggregate supply. Given the aggregate level of aggregate demand, this means the rise in the general price level. This can be explained in terms of figure 2.2 below.

AD_0 and AS_0 indicate initial aggregate demand and supply curve respectively. Initial equilibrium was at point E_1 where the price is P_0 and output Y_0 . Now with the contraction of supply due to supply shock AS_0 shifts upward and to the left and the new aggregate supply is indicated by AS_1 . Given the demand, the new equilibrium occurs at point E_2 . Note that at the new equilibrium output has shrunk to Y_1 from Y_0 and price has increased to P_1 from P_0 . The fall in output implies rise in unemployment rate. Therefore, one notices a positive association between rate of inflation and unemployment rate following supply shock.

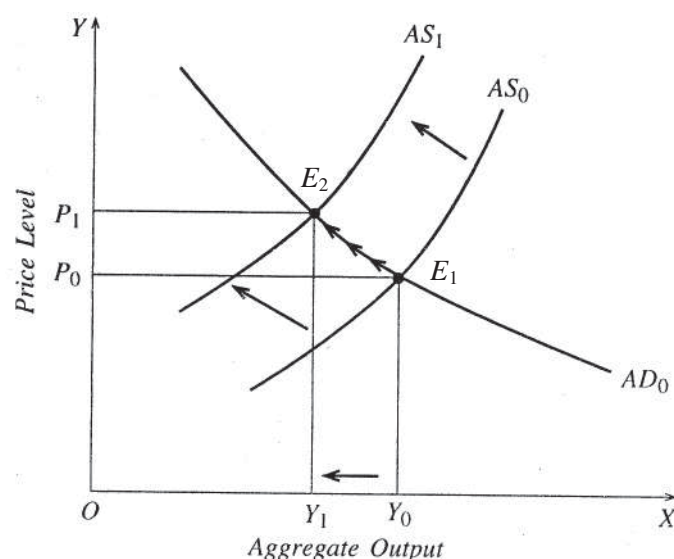


Figure 2.2

2.3 Money, Inflation and Unemployment

Now in this section we try to further evaluate the long run relationship between unemployment and inflation from the monetarist point of view. We will look at the effect of change in money supply on the short run and long run Phillips Curve.

The monetarist version of the Phillips Curve is based on the two concepts :

- (a) The natural rate of unemployment and
- (b) The adaptive expectation principles.

(a) The natural rate theory

According to the natural rate theory, there exists an equilibrium level of output and an accompanying rate of unemployment determined by the supply of factors of production, technology and institution of the economy. This rate of unemployment is Friedman's natural rate. Expansionary monetary policies move output above the natural rate and move the unemployment below the natural rate for a time. The increased demand resulting from such an expansionary policy would also cause prices to rise. Friedman does not believe that equilibrating forces cause the levels of output and employment to return to their natural rate over a longer period. In Friedman's view, it is not possible for the Government to use monetary policy to maintain the economy permanently at a level of output that holds the unemployment rate below the natural rate. The natural rate of unemployment is a level such that the labour demand equals labour supply at an equilibrium real wage. Such a situation is shown in Fig. 2.3 with two parts (a) and (b). The labour demand schedule in part-a is the familiar marginal product of labour schedule (MPN). At N^* , the natural rate of employment, labour demand is equated with the labour supply, where in drawing the labour supply schedule, N^S [$W/P^e = P$], we stipulate that the price level expected by labour supplier is equal to the actual price level ($P^e = P$). Only at this level of employment there is no tendency for the real wage to change. Labour demand and supply are equated. Moreover, labour suppliers have a correct expectation of the price level. If such were not the case, there would be a tendency for labour supply to change as workers perceived that their expectation were in error. The natural rate of unemployment can be found simply by subtracting those employed from the total labour force and expressing this number as a percentage of the total labour force. Using the production function in part b of the figure, we can find the level of output that will result from employment level N^* . This is the natural level of output, Y^* .

a. The Natural Rate of Employment

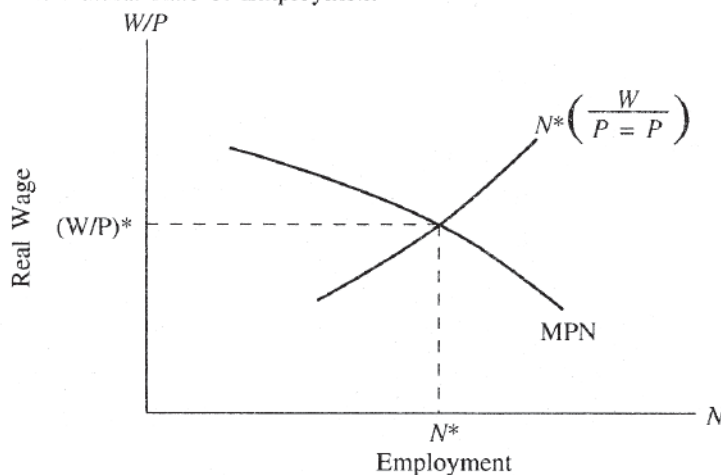


Figure 2.3 Part (a)

b. The Natural Rate of Output

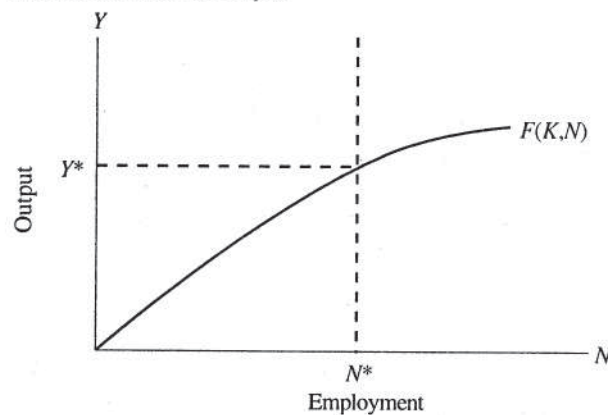


Figure 2.3 Part (b)

(b) The short run and long run Phillips Curve : A monetarist view

To see why Friedman and other monetarists believe that output and employment diverge from their natural rates temporarily, but come back to their natural rates, we examine Friedman's analysis of the short run and long run consequences of an increase in the rate of growth in the money stock.

Monetary Policy in the short run

Let us suppose that we begin with a situation in which the economy is in equilibrium at natural rate of unemployment and output. Also the money stock has been growing at rate equal to the rate of growth of real output. Thus the price level is assumed to be stable over time. Suppose now that the rate of growth in the money stock is increased above the rate consistent with price stability. The increase in the growth rate of the money stock will stimulate aggregate demand and as a consequence, nominal income increases. This will lead to an increase in employment level thus reducing unemployment. A rise in the price level as a result of increase in money supply can also be obtained from the quantity theory of money which is shown as $MV = PY$, where M is the money supply, V is the velocity of money, P is the price level and Y is the output. Now if V and Y are held constant, then an increase in M will directly result in an increase in the price level, P . Thus, increase in money supply will lead to inflation. But it will also stimulate aggregate demand and hence increase output level as a consequence and hence reduce unemployment.

The Phillips Curve (PC) is a negative relationship between the unemployment rate (\dot{U}) and the inflation rate (\dot{P}), as shown in Fig. 2.4. A high rate of growth in aggregate demand stimulates output and hence lower unemployment. Such high rates of growth in demand also cause an increase in the rate at which prices rise (i.e. raise inflation rate). Then the Phillips

Curve postulates trade-off between the rate of unemployment and inflation. The short run effect of an increase in the rate of growth of the money stock is shown in Figure 2.4.

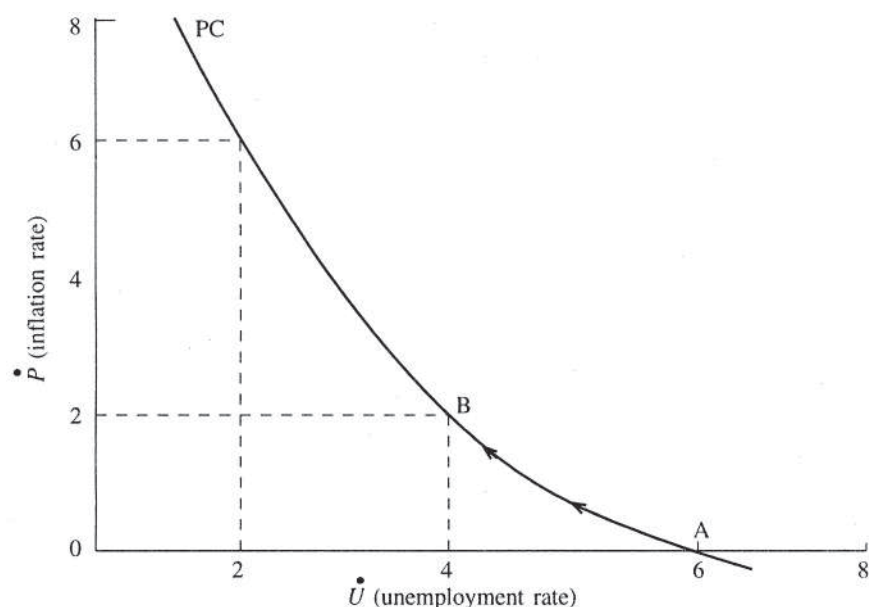


Figure 2.4

In the figure, the original equilibrium is with stable price ($\dot{P} = 0$) and unemployment equal to the natural rate assumed to be 6% (from point A in Fig. 2.4). We assume, as a result of the increase in the rate of growth in the money stock, the economy moves to new short run equilibrium with unemployment being reduced to 4% and inflation at 2% (point B in the figure).

Monetary Policy in the long run

The distinctive element in the Friedman's analysis is his view of the long run effects of monetary policy. Here the natural rate of unemployment theory also comes into play.

Friedman argues that in the short run, product price increases faster than the factor prices, the crucial factor price being the money wage. Thus the real wage (W/P) falls. But Friedman argues that workers are not always on the labour supply curves and does not know their real wage. In the short run, after a period of stable prices the workers are assumed to evaluate nominal wage offers at the earlier price level. Though prices have risen but not yet seen this rise, and they increase labour supply if offered a higher money wage even if this increase is less than the increase in price level i.e. even if real wage is lower. Thus in the short run labour supply increases along with an increase in labour demand. Unemployment can, therefore, be pushed below the natural rate.

But the above situation is temporary for workers who eventually observe the higher price level and demand higher money wages. According to Fig. 2.3, the real wage has been pushed below (W/P^*) , the wage that clears the labour market, once the labour supplier correctly perceives the price level and hence real wage. At a lower wage there is an excess demand for labour, which pushes the real wage back to its equilibrium level and this rise in the real wage causes employment to return to the natural rate shown in Fig. 2.3.

The implications for the Phillips curve of this long run adjustment are illustrated in Fig. 2.5. Here we have made explicit the fact that the curve is drawn for a given expected rate of inflation on the part of the suppliers of labour which in this case refers to stable prices ($\dot{P}^e = 0$, where \dot{P}^e is the expected rate of inflation).

Now suppose that there is an increase in the money supply which moves the economy from point A to point B.

But as suppliers can anticipate that prices are rising they will demand a higher rate of increase in money wage and as a consequence higher rate of inflation will now correspond to any given unemployment rate with the rightward shift of the short-run Phillips Curve. If the money growth shows no further change the economy will return to the natural rate of unemployment of 6%, but now with an inflation rate of 2% instead of stable price level. In terms of figure 2.5, the longer run adjustment moves the economy from point B to C.

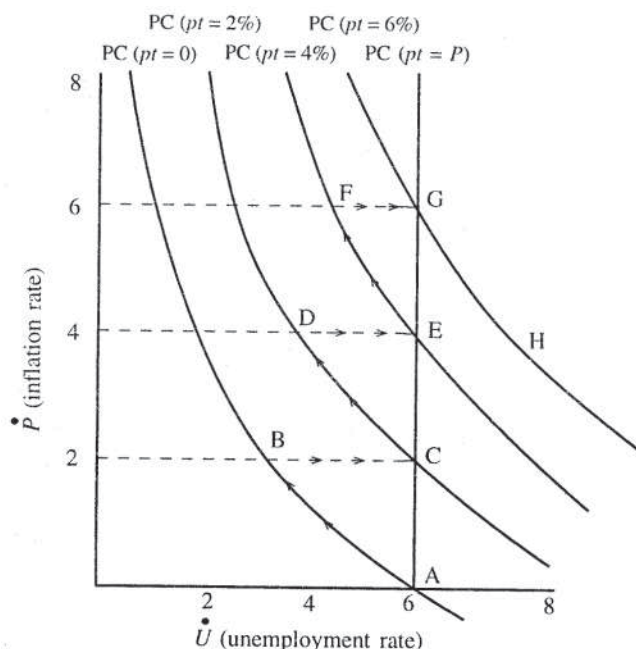


Figure 2.5

Eventually, this adjustment process can be followed continuously and by joining the points A, C and E we will obtain the long run Phillips Curve which as shown in Fig. 2.5 will be vertical.

However, when inflation has persisted for a long run, inflationary expectations become built in the system. At point E, the expansionary aggregate demand policies have increased the expected inflation to 4%. Any attempt to lower inflation by slowing the rate of growth in money stock will not immediately move the economy back to the initial point A. In the short run we will move along the short-run Phillips curve that corresponds to an expected inflation rate of 4%, to a point such as F, in Fig. 2.5 with high inflation and unemployment above the natural rate. This is stagflation.

Actually, here also the adjustment in the expectation, that inflation rate has slowed, will take time, and hence the wage rate will adjust slowly. In the meantime, the economy will suffer from high inflation and high unemployment i.e. stagflation.

2.4 Stagflation

Stagflation refers to a situation where a high rate of inflation occurs simultaneously with a high rate of unemployment. This is actually shown by the point F, in Figure 2.5. The term stagflation was coined in the seventies of the last century when several developed countries of the world received a supply shock in terms of rapid hike in oil prices. India too was hit by the oil price shocks in 1973 and 1979.

2.4.1 Causes of Stagflation

1) Supply Shock

Any shock to the economy that tends to shift the aggregate supply curve upward can lead to stagflation. For example, in 1973 the major oil producing countries hiked the oil price fourfold. Along with it there was also a relative increase in the price of foodgrain and worldwide shortage of basic raw materials. These resulted in rise in prices and thereby, rise in costs of production resulting in fall in aggregate supply. Actually, an adverse supply shock, which increased costs of production, shifted the aggregate supply curve leftwards. The phenomenon is illustrated in figure 2.6. With unchanged aggregate demand AD_0 the initial equilibrium was at E_0 . With an adverse supply shock, the aggregate supply curve AS shifts to AS_1 from AS_0 , with aggregate demand curve remaining unchanged at AD_0 . The new equilibrium occurs at E_1 , where there is both a rise in the price level and a reduction

in the output level, and thereby, in the level of employment. Thus stagflation may result due to adverse supply shock.

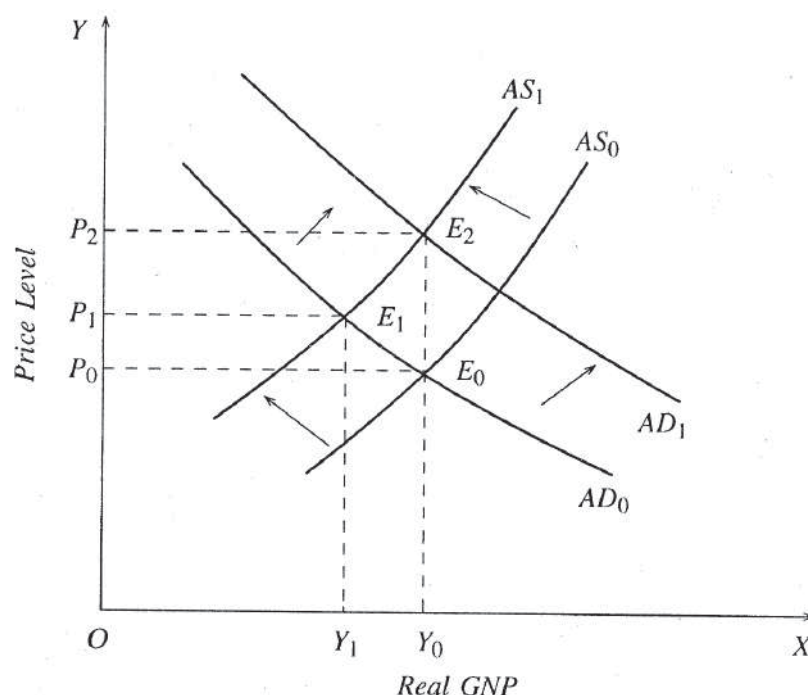


Figure 2.6

2) Policy Dilemma and Stagflation

Once the inflationary process sets in via any supply shock, the inflationary expectation will be continuously shifting the AS curve upwards. Suppose policy makers increase the money supply at a rate sufficient to keep total demand rising at the same rate as change in aggregate supply. Then aggregate demand will rise continuously, which further confirms the inflationary expectation and thereby, causes continuous rise in the aggregate supply. Total output remains stable. But price level rises continuously due to higher inflationary expectation. The employment rate remains the same, while the price level rises. This is actually stagflation. Now suppose the policy makers want to curb inflation. Therefore, certain demand restraint policies are pursued. So demand does not go up. But due to anticipated inflation AS curve continues to shift up and hence, total output reduces to Y_1 . Note that here shift in AS is due to inflationary expectations, and AD does not rise as the Government prevents it. The price level rises to P_1 along with rise in unemployment rate. Then the policy makers' attempt to halt the rise in the general price level does not succeed. At the same time, the economy experiences a recession and a rise in unemployment rate.

It is likely that policy makers will now be faced with the task of fighting the recession and reduce the unemployment rate. Then if they increase total demand by increasing money supply, total output will rise to Y_0 , and the equilibrium shifts to E_1 . Unemployment is reduced but there is rise in the price level.

3) Inflationary expectation

Inflationary expectation is another major cause of inflation in 1970's. With high inflationary expectations, due to the Vietnam War in 1960's, the workers continuously pressed for higher wage rates in the 1970's. Business firms, in the context of mounting inflation, did not resist demand for higher nominal wages by the labour force. Hence, they granted higher wages, raised unit cost of production leading to shift in the AS curve to the left. Thus stagflation sets in.

2.5 Expectation Augmented Phillips Curve

The Phillips Curve posits that the inflation rate, the rate of change in the price level, depends on three factors :

- 1) Expected Inflation
- 2) Cyclical unemployment
- 3) Supply shocks

These three factors are expressed in the following equation :

$$\Pi = \Pi^e - \beta(u - u^n) + V$$

where Π is rate of inflation, Π^e is expected inflation, $(u - u^n)$ is cyclical unemployment with u^n denoting the natural rate of unemployment, V the supply shock and β is a parameter measuring the response to cyclical unemployment.

Expectations and Inflation Inertia

To understand the options facing the policy makers, in terms of the Phillips curve we must know what determines expected inflation. A simple and often plausible assumption is that people form their expectation of inflation on the basis of recently observed rate of change in the price level. This assumption is called adaptive expectation. For example, suppose that people expect prices would rise this year, at the same rate they did last year. Then the expected rate of inflation is $\Pi^e = \Pi_{-1}$ where Π_{-1} is the rate of inflation last year.

Then we can write the equation of the Phillips curve as

$$\Pi = \Pi_{-1} - \beta(u - u^n) + V$$

which states inflation depends on past inflation, cyclical unemployment and supply shock. This natural rate of unemployment is often called the Non-Accelerating Inflationary Rate of Unemployment (NAIRU).

The first term of the Phillips Curve is the expected rate of inflation, which is based on the adaptive expectation model, given by Π^e . But here an expectation is formed via, the adaptive expectation model, so $\Pi^e = \Pi_{-1}$ which implies inflation inertia. That is, if unemployment is at its natural rate and if there is no supply shock, prices will continue to rise at prevailing rate of inflation. This is due to the assumption that past inflation influences future inflation expectations, and because these expectations also affect the wages and prices that people set. If prices have been rising quickly, people will expect them to continue to rise quickly, because the position of the short run Phillips Curve will be shifting upward over time.

2.6 The Political Economy of Inflation and Unemployment

Unemployment and inflation are both evils for a society and a democratic government will always want to reduce both. Simultaneous reduction in unemployment and inflation is, in the short run, the aim of the policy maker. But this policy is often offset by the issue of how to fight inflation shocks, knowing that such policy decision may lead to increase in unemployment. But in the long run, policy makers face the decision in order to accommodate a low inflation rate or allow positive inflation.

Different Policy Options

Here we will discuss about two possible adjustment paths in order to bring back an economy from a position of high inflation and unemployment to its long run stable equilibrium position.

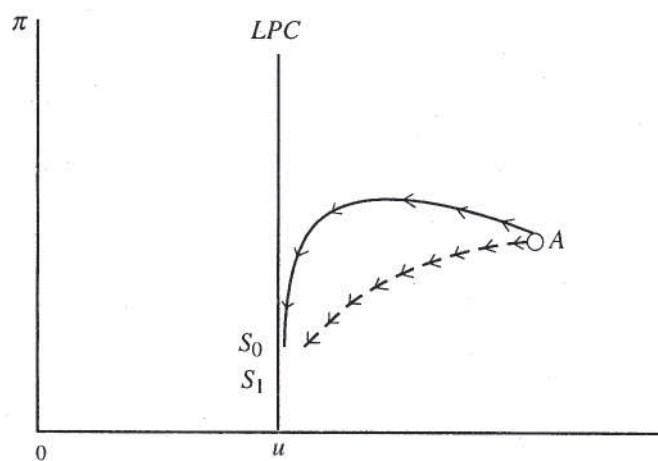


Figure 2.7

Figure 2.7 shows a long run Phillips Curve, showing long run trade-off between inflation and unemployment. Now suppose due to an oil shock, the economy is at point

A, with high inflation and unemployment. Two possible paths could be followed to bring the economy back at a stable situation with low inflation and unemployment.

In figure 2.7 we can see that if we follow the solid line, then there is higher inflation rates in the transition and corresponds to a policy choice of rapid restoration of low unemployment levels and then a period of rapid disinflation. This is a more gradualist disinflation policy and is known as Gradualism. The other path shows, an immediate reduction in unemployment. Actually, in the Gradualist policy, there is a small initial reduction in the money growth, which reduces the aggregate demand. The reduction in aggregate demand takes the economy to a new equilibrium with a lower level of inflation. In response to this lower inflation, the short run supply curve (in the fig. AS_0) shifts downward to AS_1 . A further small cut in the money growth rate, again, moves the economy to a new equilibrium at point E_2 , with further shift in the aggregate supply curve and the process continues, until the output returns to its previous level. This is explained in figure 2.8.

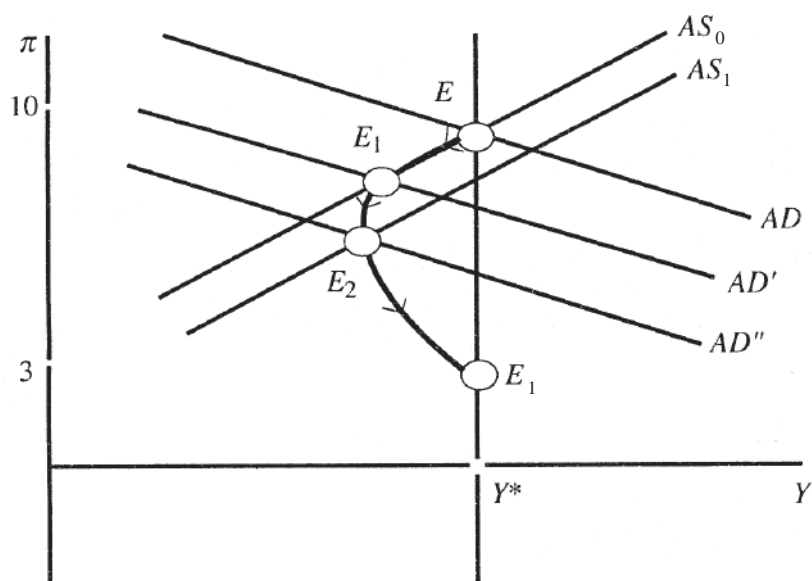


Figure 2.8

In the other strategy, all other things are the same, except that, initially there is a sharp initial decline in money supply, shifting the aggregate demand curve to AD_1 , (Shift in this curve is more than in case of gradualism). This reduces inflation sharply, resulting in further decline in the AS curve. The pressure is kept by holding the rate of money growth low. This is shown in figure 2.9.

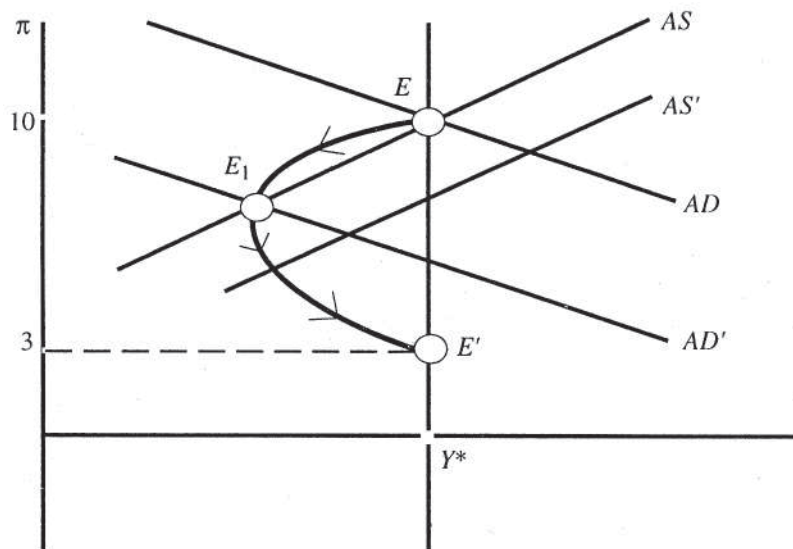


Figure 2.9

Regarding credibility it is argued that the second policy is much more credible, as people will be more aware of a change in policy and hence will adjust their expectations accordingly, which will further reduce inflation. Thus the task for the policy makers is not to choose between inflation and unemployment, but rather between the adjustment paths that differ in the inflation unemployment mix. There are two different ways of thinking about this problem : one way is to think that policy makers are benevolent dictators who act in the interest of a society. They estimate social cost associated with alternative paths of inflation and unemployment, and choose the path which minimizes the total cost of stabilization to the society. But, generally, we do find, policy makers respond to the electorate and choose policies that will maximize their chances of being kept in office. Thus, generally we find politicians use restrictive policies early in administration, raising unemployment to reducing inflation, putting the blame on previous administration, but as election approaches, expansion takes over to assure falling unemployment, to gain voters' confidence. Thus to get out of this political cycle, one important way is to keep the central bank out of the influence of politics, so that it can take timely stern action.

2.7 Let Us Sum Up

We have seen in this unit the relationship between inflation and unemployment. The short run Phillips curve indicates that there exists a trade-off between inflation and

unemployment. The short run view was refuted in the long run context by Friedman. In the long run the Phillips curve becomes vertical.

The idea of trade-off between inflation and unemployment received a big jolt in the seventies with the emerging situation where high rate of inflation and unemployment coexisted. This is known as stagflation. This was analysed in terms of aggregate supply shock in the economy.

Lastly, we have learnt about two different policy options.

Gradualist policy which attacks the problem of both inflation and unemployment by depressing aggregate demand and the other policy in which people will be more aware of a change in policy and hence will adjust their expectations accordingly.

2.8 Questions

- (i) What do you mean by inflation?
- (ii) Explain the short run Phillips curve.
- (iii) Explain the long run Phillips curve.
- (iv) What is stagflation? What are the different causes of stagflation?
- (v) Explain different policy options in reducing inflation and unemployment.
- (vi) Explain the role of expectation in analyzing the relationship between inflation and unemployment.

2.9 References

Mankiw, N. Gregory, Macroeconomics, Fifth Edition, Worth Publishers, 2003.

Unit 3 □ Central Bank, Money, Credit and Financial Markets

Structure

- 3.0 Objectives**
- 3.1 Introduction**
- 3.2 Money Stock Determination**
- 3.3 The Money Multiplier**
- 3.4 Equilibrium in the Financial Markets**
 - 3.4.1 The Supply and Demand for Loanable Funds**
 - 3.4.2 Equilibrium in the Financial Market**
- 3.5 Money, Credit and Interest Rates**
- 3.6 Targets for the Central Bank**
- 3.7 Let Us Sum UP**
- 3.8 Questions**
- 3.9 References**

3.0 Objectives

By the time you have studied this unit you should be able to :

- Explain what determines money stock.
- Explain the concept of money multiplier.
- Explain how equilibrium is attained in the financial market with the aid of a loanable funds theory.
- Explain the relationship between money, credit and interest rates.
- Describe the target for the Central Bank.

3.1 Introduction

In this unit, we will learn about money, credit and financial markets. Money is the medium of exchange and performs four different functions as a unit of account, medium of exchange, store of deferred value and means of payment. In the first section we have analysed how money stock is determined. The concept of money multiplier is introduced

in the next section followed by a description of the relationship between money, credit and interest rates in the following section. Lastly, we have analysed the targets for the Central Bank of a country in connection with the monetary policy goals.

3.2 Money Stock Determination

In this section, we will have a brief discussion of the mechanism of money supply determination. We will start our discussion first by analyzing the different components of money supply and then we will, briefly, discuss the different tools with which the government controls the money supply.

Money supply comprises mainly of the currency and demand deposits, i.e.,

$$M = CU + D \quad (1)$$

where M = money supply, CU = Currency and D = Demand deposit.

Here we are analyzing only uniform class of demand deposits, D , which are held by the public. The money supply is affected by the behaviour of both the public and the banks. The public's demand for currency affects the currency component, CU and its demand for deposits affects the deposit component, D . These deposits are actually debt which banks owe to the customers and here the banks play a vital role in controlling the money supply. The three major components which determine the money supply are :

1. Currency deposit ratio (CD)
2. The reserve ratio (RD)
3. The stock of high-powered money (H).

(1) The Currency Deposit Ratio :

The currency-deposit ratio is actually the ratio of currency held by the public to the demand deposits held by the public, $CD = \text{Currency}/\text{Demand deposit}$.

Generally, the payment habits of the public determine how much currency will be held by them relative to the demand deposits.

Factors affecting the currency deposit ratio :

- i) The costs and convenience of obtaining cash affect the currency deposit ratio. For example, if there is an ATM counter nearby, then people will, on an average, carry less cash with them because the cost of carrying cash will be lower.
- ii) The seasonal pattern is also important in influencing the currency-deposit ratio. In some seasons, say festival season, people tend to hold more currency as they need more liquidity. Hence, in such seasons currency-deposit ratio (CD) will tend to be higher.

(2) The Reserve Deposit Ratio :

The banks need to hold certain portion of their deposits in the form of reserves with the country's central bank. The Reserve deposit ratio (RD) is the ratio of reserves that the banks need to hold in the central bank to the demand deposits held by them. The banks hold the reserves in the form of currency and the deposits with the central bank. The banks hold these reserves to meet the liquidity requirements of their customers. Holding these reserves is statutory too.

Factors affecting the reserve-deposit ratio :

The reserve-deposit ratio (RD) is affected by two different factors :

Firstly, the central bank sets the minimum reserve requirements for banks, known as required reserves (RR). The banks are required to keep a statutory minimum proportion of the demand deposits held with them at the central bank.

Secondly, the banks also decide how much excess reserves they will keep beyond the level of required reserve. This is so because holding idle cash balance is not profitable for the banks. Hence, they decide how much to lend and how much to keep as excess reserve to meet the liquidity requirements of their customers. They take this decision by comparing the cost of holding more reserves vis-a-vis the benefits of holding excess reserves.

The cost of holding excess reserves is the interest earnings foregone from holding interest bearing assets. Thus, we can expect reserves to fall if banks hold interest bearing assets.

Banks keep excess reserves in accordance with the uncertainty in the market. In a market where risk or uncertainty is high, benefits of holding excess reserves is more because greater the uncertainty, the more likely a bank will have to face demands for cash withdrawal by the general public.

Another factor which affects the reserve deposits is the discount rate. The discount rate is the interest rate charged by the Central Bank to other commercial banks which borrow from it to meet the temporary need for reserves. Thus higher the discount rate more will be the tendency of the banks to keep excess reserves.

Higher discount rate, thereby, discourages banks to hold interest bearing assets. Therefore, the cost of holding excess reserves will be very high when discount rate is high because the banks are then forced to forego the interests earned on interest bearing assets.

Then if RE denotes the banks' excess reserves, then

$$RE = f(i, i_D, r_R, \sigma)$$

where i is the interest rate on interest-bearing assets, i_D is the discount rate, r_R is the rate of required reserves and σ refers to uncertainty.

An increase in i reduces excess reserve while an increase in the other variables increases excess reserves. From the above relation, we also find that if all other factors are

assumed to be constant, then supply of money itself may be a function of market interest rate.

(3) High-powered Money :

High-powered money (H) consists of currency and banks' deposits at the central bank. It actually consists of currency issued by the government and the central bank, CU, plus the reserves which are held by the banks, R.

$$\text{Then } H = CU + R, \quad (2)$$

where H is high-powered money.

In India, the central bank, the Reserve Bank of India, and the government are providers of the high-powered money.

If we compare equations (1) and (2), then we find that the difference between the two equations is that in equation (1) deposits are added to the currency held by the public while in equation (2) currency held by the public is added to cash reserves (R) of the banks. In fact, we will see that it is against the cash reserves, R, that banks are able to generate multiple expansions of credit and thereby, of money supply in the economy.

In figure 3.1, the base shows the total stock of money (M) while the top shows the supply of high-powered money, H. The total stock of money, as seen from the figure, is a multiple of the high-powered money. There exists one-to-one relationship between currency held by the public and money supply. But the bank deposits are multiple of the cash reserves of the bank, which is a part of the high-powered money. The relationship between money supply and the high-powered money is actually indicated in terms of the money multiplier.

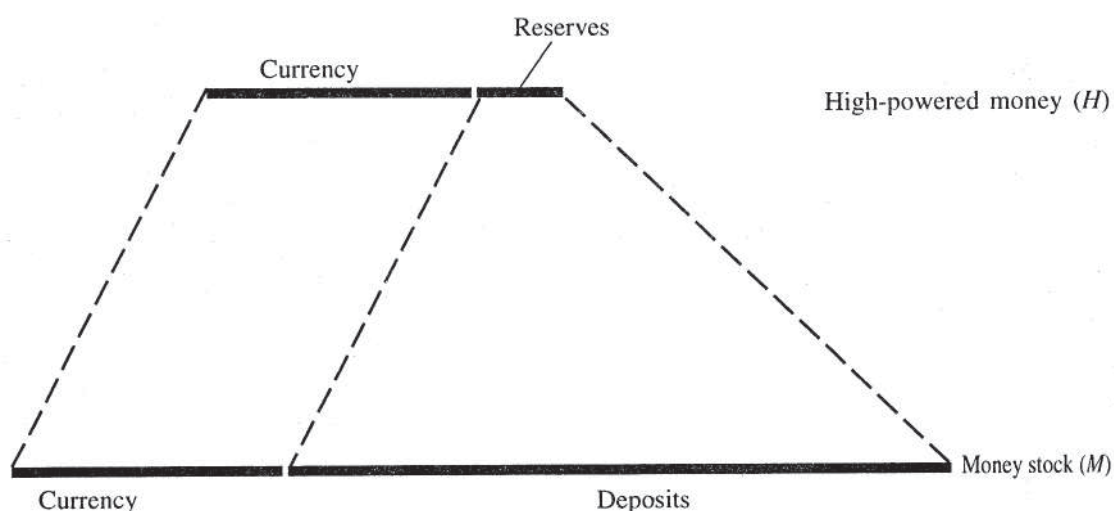


Figure 3.1

3.3 The Money Multiplier

The concept of money multiplier helps us to ascertain the relationship between money supply and high powered money. To what extent money stock changes due to an increment in high powered money is established by money multiplier. The money multiplier is the ratio of the stock of money to the stock of high-powered money :

$$\text{Multiplier (m)} = M / H$$

$$\text{or } M = mH$$

The value of the money multiplier is greater than unity.

Derivation of the money multiplier

First, let us consider the equation for money supply.

We know from (1).

$$\begin{aligned} M &= D + CU \\ &= (1 + CD)D \end{aligned} \tag{3}$$

where $CU/D = CD$, is the currency deposit ratio.

Now let us consider the equation of high-powered money. From (2) we know

$$\begin{aligned} H &= CU + R \\ &= (CD + RD)D \end{aligned} \tag{4}$$

where $RD = R/D$, the reserve-deposit ratio.

Dividing (3) by (4) we get :

$$M/H = (1 + CD)/(CD + RD) = m. \tag{5}$$

Then we find that the money multiplier depends on CD (currency deposit ratio) and RD (reserve deposit ratio).

$$\text{Hence, } M = m H. \tag{6}$$

Equation (6) indicates that the money supply depends on reserve ratio (RD), currency-deposit ratio (CU) and the stock of high-powered money, H.

Then we can write :

$$\Delta M = m \Delta H \tag{7}$$

where ΔM is change in money supply and ΔH is change in high-powered money. Thus, m indicates by how much money supply will change due to one unit change in high-powered money. Thereby, m is the money-multiplier.

The value of the multiplier depends on following factors :

- (1) The reserve ratio : the money multiplier is larger, the smaller the reserve ratio, RD.
- (2) The currency-deposit ratio : the money multiplier is larger the smaller the currency-deposit ratio, CD. This is because the smaller the CD, the smaller the proportion of the high-powered money as currency and larger the proportion that is available as reserves.

Note that $(1 + CD) > (RD + CD)$ since $0 < CD < 1$ and $0 < RD < 1$. Therefore, $m = (1 + CD)/(CD + RD) > 1$. This means that one unit increase in high-powered money will lead to multiple expansions in money stock.

Now we are in a position to discuss the money-multiplier process. It is called the multiplier process because it is a process over time which ultimately results in multiple expansion or creation of bank credit, deposits and money from a given increase in H. It explains 'how banks create credit or deposits' when their reserve base increases. Thereby, it also explains the source of the high-poweredness of H.

For analytical simplification of the multiplier process, we shall first make a few simplifying assumptions and conduct the analysis with the help of a numerical example.

The simplifying assumptions are given below :

1. Banks offer only one kind of deposits, namely, demand deposits (shown by D);
2. The earning assets of banks comprise only loans to commercial borrowers (shown by L);
3. The average as well as marginal value of the desired currency-deposit ratio (shown by CD) is 0.5;
4. The desired reserve-deposit ratio of banks (which includes both the required reserve ratio and their excess reserve ratio) is 0.1; and
5. There is no dearth of the demand for bank loans at the going lending rate of the banks, so that the banks can remain 'fully loaned up' all the time. This, then, gives only the maximum value of the multiplier, not necessarily its true value.

The underlying basis of the multiplier process is the fractional reserve system of the commercial banking, which is itself based on the common experiences of the banks : (a) that not all depositors come to withdraw all their deposits at the same time, a matter of faith in the continued liquidity and solvency of banks and (b) that if there are outflows of some deposits, there are inflows of fresh deposits every day, so that a bank need to keep only a certain fraction of total deposits in the form of cash reserves and the rest can be either loaned out or invested to earn income.

Now suppose that the public comes in possession of ΔH worth Rs. 60 crores, because (say) the government spends this amount on the purchase of goods and services from the public. Further suppose that the payment is made in the form of cheques drawn on the RBI. The public deposits these cheques with their banks for collection. The banks, after collection, credit the deposit accounts of their clients. Thereby, each of the D of the public and R with the banks increases by Rs. 60 crores. But, by our assumption of constant

currency-deposit ratio (CD) of 0.5, the public withdraws Rs. 20 crores from banks in currency and leaves only Rs. 40 crores worth of D and R with banks. Alternatively, we could have started the story by simply saying that the public comes in possession of additional currency (or ΔH) worth Rs. 60 crores, Rs. 20 crores of which they keep with themselves in the form of currency and deposit the rest (Rs. 40 crores) with banks, so that they maintain the value of their desired CD at 0.5.

The crucial point is that either way the banks come in possession of ΔR worth Rs. 40 crores through their sale of deposits of equal value. Such deposits that bring in new reserves to banks are called primary deposits. The multiple creation of credit deposits and money starts with the receipt of the new reserves, ΔR of Rs. 40 crores in the example. Till now nothing of the sort has happened.

Now, the banks find it neither necessary nor profitable to hold on to all the ΔR of Rs. 40 crores, as these reserves do not earn them any interest income. According to their desired reserve-ratio (RD) of 1 they need to keep only Rs. 4 crores with them and lend the rest (Rs. 36 crores) to the borrowers on interest. (We have already assumed above that the demand for bank loans at the going lending rate of banks is perfectly elastic). When the banks lend Rs. 36 crores, this constitutes the first round of their credit creation. Since the deposit liabilities of banks are a part of money supply in the economy, the banks do not (have to) pay their borrowers in the form of cash. All that they do is to allow their borrowers to draw cheques upon their loan/credit accounts with concerned banks upto the maximum amounts of loans or credit granted.

This is where another feature of commercial banking comes to the fore. When the borrowers spend the loan amount in the market, the recipients of payments withdraw in currency only a part of these payments and deposit the rest with banks. How much they withdraw in currency will depend on the desired value of CD of the public. In the example, we have assumed it to be 0.5. So, the public withdraws Rs. 12 crores in the form of currency and deposits Rs. 24 crores back with banks. The usual form of realizing payment of a cheque is to deposit it for collection in one's account with a bank. This way, though individual banks are subjected to clearing, most of the cash except that represented by currency drain stays with banks as a whole. This is a unique feature of the chequeable deposits of banks a feature which makes them serve as means of payment.

The currency withdrawal from banks is called currency drain (for banks) and the return flow of deposits represents accretion of secondary deposits. These deposits are different from primary deposits in that they do not bring in any new reserves to banks. Rather they have been created out of loans (or credit) extended by the banks themselves, as should be clear from the above example (For individual banks or depositors, however, the

distinction between primary and secondary deposits is of no significance or relevance, as they have no means of knowing which is what most of the time. For example, instead of writing a cheque on my account and depositing it with another bank, I may withdraw cash from one and deposit it in another bank. But, for understanding the process of multiple creations of credit, deposits and money for the banking system as a whole, the distinction is of great analytical significance.)

With the accretion of secondary deposits of Rs. 24 crores, the second-round increase in deposits and money has taken place. (It had started with loan-making or credit extension by banks.) When the banks receive Rs. 24 crores of (secondary) deposits, this indicates that out of the first-round credit of Rs. 36 crores, they have lost only Rs. 12 crores as currency drain to the public. That is, if they have Rs. 24 crores of new (or additional) deposit liabilities, they are also left with Rs. 24 crores of reserves with them. But not all of it can be lent out. Against change in deposits of Rs. 24 crores they have to keep reserves of Rs. 2.4 crores (at the value of 0.1 of reserve-deposit ratio). Then, the surplus or undesired excess reserves with them will be of the value of Rs. 21.6 (= 24-2.4) crores. Banks lend this again, which represents second-round creation of credit for them. Again, as the loan proceeds are spent by the borrower, the recipients of payments redeposit with banks only Rs. 14.4 crores and withdraw from banks Rs. 7.2 crores in cash to add to their holdings of currency. This currency drain reduces the surplus excess reserves with banks from Rs. 21.6 crores to Rs. 14.4 crores, the amount exactly equal to third-round gain of deposits by banks.

The above process goes on in several rounds of credit creation and creation of deposits and money. But in each round the amounts of credit deposit and money become smaller and smaller. As in the Keynesian theory of expectation multiplier, each series of expansion of credit, deposit and money is an infinite geometric series. But since each involves a positive common factor of value of less than one, each series can be summed up.

The formula for the sum of a geometric series, which can, in general, be written

$$\text{SUM} = 1 + a + a^2 + \dots$$

where a is a number between -1 and $+1$, is

$$\text{SUM} = [1/(1 - a)].$$

In our example, the rounds of expansion of D will be (in Rs. Crores) 40, 24, 14.4 They will sum up to $(1/CD + RD)$. ΔH or $1/(0.5 + 0.1) \times \text{Rs. } 60 \text{ crores} = \text{Rs. } 100 \text{ crores}$.

This can be explained as follows :

$$\Delta D = (1/1 + CD) + (1/1 + CD)(1 - RD/1 + CD) + (1/1 + CD)(1 - RD/1 + CD)^2 + \dots$$

This means in the first round deposits increase by $(1/1 + CD)$ if there is an increase in high powered money H by Rs. 1, say i.e. $\Delta H = 1$ here. This is because an increase of

H by one unit would increase currency holding by $(CD/1 + CD)$ units. So, the increase in deposit due expansion in H by one unit is $[1 - (CD/1 + CD)] = (1/1 + CD)$ units. Then, in round 2 expansion in deposits will be $(1/1 + CD)(1 - RD/1 + CD)$. This is because in the first round increase in reserves due to deposit expansion will be $(RD/1 + CD)$. Then, increase in bank loan will be $(1 - RD/1 + CD)$ units in the round 1. As a result of this credit expansion, currency holding would expand by $(CD/1 + CD)(1 - RD/1 + CD)$ units in the round 2. So, deposits will expand by $[1 - (CD/1 + CD)(1 - RD/1 + CD)]$ units $= (1/1 + CD)(1 - RD/1 + CD)$ in round 2. Similarly, the process continues in the next round and we get the above infinite geometric series which is converging. Note that if we take $(1/1 + CD)$ common, then the common ratio of the series, $r = (1 - RD/1 + CD)$. Then, applying the summation formula of the geometric series we obtain $\Delta D = (1/CD + RD)$. This is known as the deposit multiplier.

Applying the same logic we get the credit multiplier and money multiplier shown below.

The rounds of expansion of bank credit (in Rs. Crores) will be given by 36, 21.6, 12.96 They will sum to $(1 - RD) / (CD + RD)$. ΔH or $(1 - RD)$. $\Delta D = \text{Rs. } 90 \text{ crores}$.

Similarly, on summation, the expansion of money supply will be given by $(1 + CD) / (CD + RD)$. $\Delta H = 2.5 \times \text{Rs. } 60 \text{ crores} = \text{Rs. } 150 \text{ crores}$.

In the above example, the respective multipliers are :

(a) deposit multiplier $= 1/CD + RD = 1/0.6 = 1.667$

bank credit multiplier $= (1 - RD)/(CD + RD) = 1.5$ and

(b) money multiplier $= (1 + CD)/(CD + RD) = 2.5$.

We should also note that the multiplier process is a process over time, that the several rounds of expansion of deposits and credit are not completed in one day. Then the change in H—its injection and withdrawals through (say) budgetary and other operations—take place all the time. Consequently, the expansion in deposits as well as in bank credit over any short period is also the cumulative effect of several short—period ΔH s, past and present.

3.4 Equilibrium in the Financial Market—The Loanable Funds Theory

The loanable funds theory of the determination of equilibrium interest rate is an extension of the classical savings and investment theory. The only difference here is that here monetary and non-monetary factors of savings and investment are included. Major proponents of the loanable funds theory are Knut Wicksell and other Swedish economists

and the British economist, D. H. Robertson. According to the loanable funds theory, the demand for loanable funds and the supply of loanable funds jointly determine the equilibrium rate of interest in the economy.

Contemporary to the loanable funds theory, there is the liquidity preference theory propounded by Keynes for determination of equilibrium interest rate. The major difference between the two is that while Keynesian theory jointly determines the rate of interest along with the real income, the loanable funds theory determines only the interest rate. The former treats the interest rate determination as a macroeconomic problem, while the latter treats it in microeconomic perspective.

3.4.1 The Supply and Demand for Loanable Funds

Now in this section, we will try to analyze what are the factors which are responsible for describing the supply and demand for loanable funds.

The Supply of Loanable Funds

The banks, particularly the central bank, are responsible for determining the supply of funds for loan. We have already seen

$$\begin{aligned} M &= (1 + CD)/(RD + CD)H \\ &= m(i, i_D, r_R, CD, \sigma)H. \end{aligned} \quad (8)$$

In the above equation, we find the money multiplier, m , as a function of market interest rates, the discount rate, required reserve rate, the currency-deposit ratio and variability of deposit flows. Given H , the supply of loanable funds will increase with increase in interest rates, but will decrease with increase in other factors, i.e. i_D , r_R , CD and σ .

The central bank controls the process by increasing the various interests like the discount rate, i_D , required reserve ratio, r_R . It can also control the amount of excess reserves of the banks by controlling the amount of high-powered money by its open-market operations.

But the central bank cannot exactly control the money supply, because of the unpredictability of the money multiplier. This is because we take CD and RD as given, but actually both of them vary and the central bank does not know in advance what their values will be.

The supply of loanable funds depends on the following three components :

- I. Net aggregate savings of all households and firms, S .
- II. Aggregate dishoarding, DH .
- III. Incremental money supply, ΔM .

If we consider interest rate as the price for deferring present consumption to future, when a rise in interest rate will induce people to hold less amount of money in hand at current period and, therefore, will increase savings.

Aggregate dishoarding will also decrease with increase in interest rate, as people will find less incentive to hoard.

Further, we assume that any incremental money supply is autonomously given.

So, overall as both S and DH are increasing functions of interest rate and ΔM is exogenously determined, therefore, supply of loanable funds can be considered as an increasing function of interest rate. In short, we can write.

$$LS = S + DH + \Delta M$$

where LS is supply of loanable funds with $S^1(i) > 0$ and $DH^1(i) > 0$.

Figure 3.2 shows the supply curve of loanable funds. LS is the curve : it is upward sloping meaning that as interest rate increases supply of loanable funds also increases.

Supply of loanable funds schedule

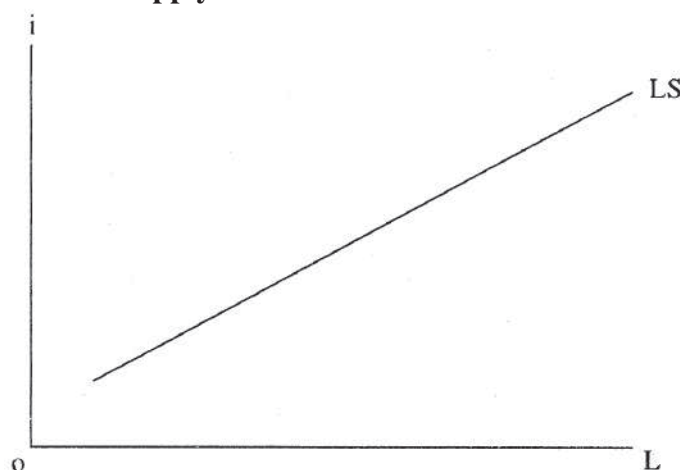


Figure 3.2

The demand for loanable funds

Money demand depends primarily on the amount of interest rate. When there is a rise in the interest rate the cost of borrowing increases and the demand for loanable funds falls. Thus when interest rate rises, people's demand for loanable funds will fall owing not only to higher cost of borrowing, but also because at higher interest rate, people will like to increase their bank deposits. So, at higher interest rate demand for money will also fall. Thus, we can write the demand for loanable funds as a function of interest rate, $L(i)$.

The demand for loanable funds is determined by the demand for gross investment expenditure and by the investment demand for money, which may also be referred to as hoarding. The standard theory suggests that investment and money demand are both a declining function of rate of interest. Whether to invest in a project depends upon the net

present value (NPV) of that project, which implies that an investment will be made if discounted cash flow from the project exceeds initial cost of investment :

i.e. if $NPV = -C_0 + \sum C_t / (1 + r)^t > 0$

where C_0 is the initial amount of investment and $\sum C_t / (1 + r)^t$ is the discounted cash flow with r being the discount rate and C_t being the cash inflow at period t .

When NPV is positive then the rate of return from a project exceeds the interest rate. Thus if interest rate rises, then chances of rate of return lying below the interest rate increases. Then overall investment in the economy will tend to fall.

Similarly, demand for money is also negatively related to interest rate—more is the interest rate, less will be the tendency of the people to hold idle cash balance and vice versa. Then demand for loanable funds is inversely related to interest rate. Figure 3.3 shows the demand schedule for loanable fund which is negatively sloped.

Demand for loanable funds schedule

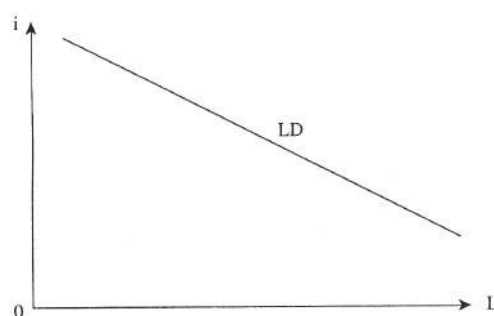


Figure 3.3

The demand for loanable funds (LD) is usually taken to be given by $LD = I + \Delta MD$; where LD is the demand for loanable funds, I is the gross investment expenditure and ΔMD is incremental demand for money or hoarding.

Equilibrium in the financial market—the loanable funds theory

The loanable funds theory is based on the following simplifying assumptions :

- a) The market for loanable funds is a fully integrated market and is characterized by perfect mobility of funds throughout the market. This assumption confirms the fact that there is one single rate of interest in the economy.
- b) Perfect competition prevails in the market so that each borrower and lender is a price taker. This assumption also ensures that one pure rate of interest prevails in the market at anytime.
- c) All other factors affecting the demand for and supply of loanable funds, other than the interest rate, are assumed to be given.

The loanable funds theory is based on the concept of flow demand and flow supply i.e. demand and supply change continuously per unit of time, and thus we obtain a flow equilibrium of loanable funds which determines the interest rate.

Equilibrium interest rate is determined by the point of intersection of the demand for and the supply of loanable funds. This means at the equilibrium.

$$LD = LS$$

or $I + \Delta MD = S + DH + \Delta M$

Figure 3.4 shows the equilibrium condition.

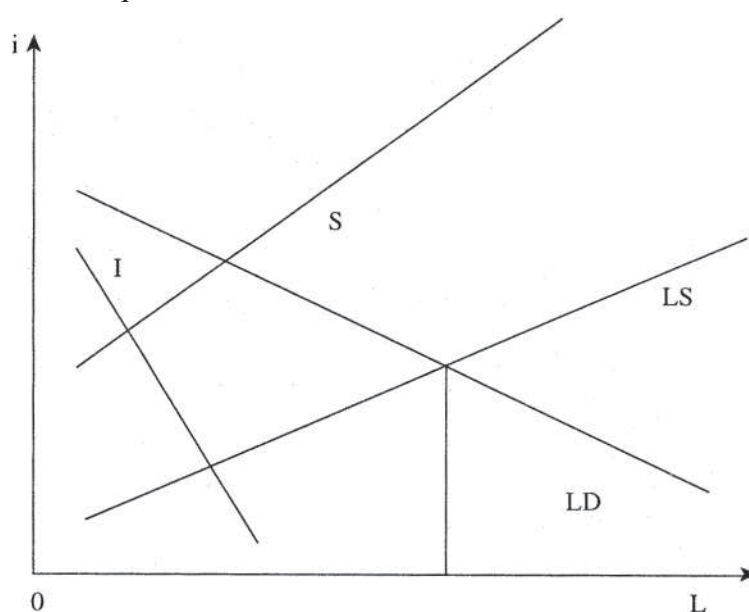


Figure 3.4

In the above figure, LD, LS, I and S are shown as functions of interest rate, i . The horizontal distance between LD and I indicates ΔMD and the horizontal distance between the LS and S schedules represent the sum of DH and ΔM . The distance between I and LD is found to be increasing with decreasing value of i as demand for money falls with fall in interest rate. Similarly, the distance between LS and S increases with increase in i , because DH is hypothesized to be an increasing function of i and ΔM is exogenously given.

Criticisms of the loanable fund theory

The loanable funds theory has been criticized on several counts :

- 1) It is argued that all that is saved is not invested via the loan market. Some savings are invested directly in the physical assets. Similarly, all investments are financed by borrowing funds, a part may be financed by own funds.

- 2) It is held that in the bond market interest rate is affected more due to exchange of old and the volume of outstanding bond, than due to the new supply of bonds and its demand at any point of time. In the loanable funds theory, it is assumed that the outstanding stock of debt does not exert any influence on determining interest rate, but this is not a very practical assumption.
- 3) It is assumed in the loanable funds theory that interest rate is not affected by changes in macroeconomic variables like savings, investment, real income, prices, demand for money and supply of money. But since interest rate determines all these variables so it is also affected by them.
- 4) Loanable fund theory also assumes fully integrated financial market but in the real world financial market is not perfectly integrated.

3.5 Money, Credit and Interest Rates

The objectives of monetary policy are to stimulate economic growth by twin goals of containing price inflation and reducing rate of unemployment at the natural rate. In this section, we will discuss the problems faced by the central bank in determining which policy variables to target to achieve its goal. First let us start our discussion with money and interest rates as target of the central bank.

Let us assume that the central bank aims a particular level of aggregate output.

In figure—3.5, the LM curve labeled LM (M) is the LM curve that exists when the central bank fixes the money stock. The LM curve labeled LM (i) describes the market equilibrium when the central bank fixes the interest rate. Its shape is horizontal at the chosen level of interest rate, i^* .

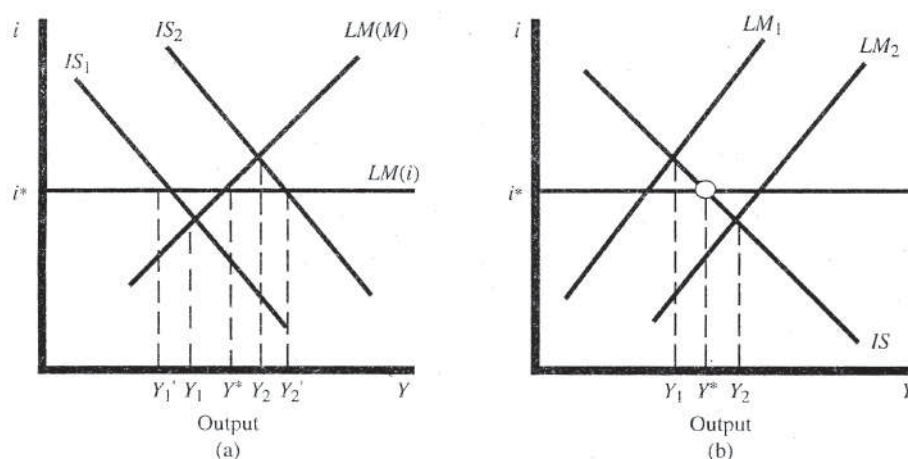


Figure 3.5

The problem regarding the policy is that the IS and LM curves shift unpredictably and hence output levels targeted is not achieved. In fig. 3.5(a), the two alternative positions of the IS curve are shown as IS_1 and IS_2 . We also assume that the central bank does not know in advance about the investment demand and hence cannot predict the exact position of the IS curve. But the central bank's aim is to have income level to come close to Y^* , the targeted level.

In Fig. 3.5(a), we see that the level of output stays closer to Y^* , if the LM curve is LM (M). In that case, the level of output will be Y_1 if the IS curve is IS_1 and Y_2 if the IS curve is IS_2 . But for any policy keeping interest rate constant we would have a level of income that is away from Y^* , Y_1 and Y_2 , instead of Y_2 . Thus we have our first conclusion that if output decreases from its equilibrium level mainly because of the shift in the IS curve, then output is stabilized by keeping the money stock constant. The central bank in this case should have monetary targets. The reason for this is that, when the IS curve shifts to the right and the LM (M) curve applies, the interest rate rises, thereby reducing investment demand and moderating the effect of the shift. But if LM (i) curve applies, there is no resistance from monetary policy to the effects of the IS shift. Monetary policy is thus automatically stabilizing when the IS curve shifts and money stock is held constant.

In fig. 3.5 (b), we assume that the IS curve is stable but the exact position of the LM curve is not known to the central bank. Assuming that the central bank can finance the money stock, a shift in the LM curve is due to the shift in the demand for money function. If the Central Bank does not know about the interest rate i while setting the money stock, then the LM curve could be any one between LM_1 and LM_2 . But if the Central Bank fixes the interest rate at i^* , then that would ensure that the level of output will be Y^* . If the Central Bank were to fix money stock instead without being not aware of the money demand function, (i.e., exactly about the position of the LM curve), then output could be Y_1 and Y_2 . But if it fixes the interest rate then the output will be exactly Y^* .

Therefore, if the output decreases from the equilibrium level because the demand for money function shifts, the central bank should operate monetary policy by fixing interest rate. That is how it automatically neutralizes the effects of shift in money demand.

But there are various criticisms, particularly from the monetarist school regarding the various Central Bank policies about fixing the interest rate.

The first criticism is that Central Bank's attempt to try to stabilize interest rate may lead to inflation. Secondly, monetarist critics argue that the Central Banks working produce through which it attempts to control and hence fixing the money stock technically defective.

In view of these criticisms and also of the different alternative policy options, it is suggested that the central bank should target both the interest rate and the stock money stock together.

Another possible target of the Central Bank, which got emphasis after 1982 basically in the USA is credit target. Benjamin Friedman of Harvard argued in favour of targeting the total debt of the non-financial sector, like government, households and firms. He showed that there exists a higher link between volume of debt and GNP than money and nominal GNP.

The amount of credit may actually be closely related to GNP because, spending may be financed by borrowing, so that growth in debt and spending moves together. In particular, investment spending is likely to be financed by borrowing or credit. Investment spending is key to the Keynesian business cycle. Thus we should expect the amount of lending to be related to GDP. Then by targeting the credit, the central bank can control GNP. The proponents of credit targeting view, emphasize on the importance of financial institution in credit targeting. They also propose that the large part of the decline in output during the 1930s Great Depression was due to the breakdown of financial system and collapse in the quantity of credit, rather than decline in the growth of money.

Secondly, the proponents argue that credit rationing does take place and its extent varies with the lenders' certain views of economic prospects. Thus, the volume of credit contains relevant information about the impact of monetary policy on the economy and not the interest rate, which no longer remains an appropriate indicator of monetary policy if credit rationing takes place.

3.6 Targets for the Central Bank

In this section, we will set the monetary policy in a broader perspective, by discussing the ultimate goals of the monetary policy. But before that we should note three points :

- (i) A key distinction between the ultimate targets and the intermediate targets. While ultimate targets are containing inflation, unemployment etc. intermediate targets are interest rates, discount rates etc.
- (ii) It matters how often the intermediate targets are reset.
- (iii) The need for targeting arises from a lack of knowledge. If the central bank has the right ultimate goals and knows exactly how the economy works, it could do whatever was needed to keep the economy as close to its ultimate targets as possible.

An ideal intermediate target for the Central Bank is available that it can control exactly and which has exact relationship with the ultimate targets of the monetary policy. But this kind of variable is not often found. So, in choosing intermediate target the Central Bank can trade off between those targets which it can control exactly and those targets that are most closely related to its ultimate targets.

One possible target of the Central Bank is its monetary base. The Central Bank can control monetary base exactly, if the latter is the ultimate target. But monetary base targeting is an intermediate one and hence may not be too reliable for hitting the ultimate target, due to the unpredictable changes in the money multiplier. Another possible target of the Central Bank is nominal GDP.

Finally, we can take the view of the critics of the Central Bank, who argue that in addition to these the Central Banks should target those intermediate variables, which will make it easy to judge its success in achieving its goals.

3.7 Let Us Sum Up

In this unit we have learnt how money stock is determined in an economy. Money stock comprises of currency in circulation with the public and demand deposits with the bank. Money stock depends on the currency deposit ratio, reserve deposit ratio and the stock of high-powered money. High-powered money is the sum of currency issued by the Central Bank and the reserves held with it.

Monetary expansion is explained by the money multiplier. Money multiplier indicates to what extent stock will change due to one unit change in the high-powered money. It also indicates that money stock increases more than the increase in high-powered money.

We have also learnt about the equilibrium growth by containing inflation and augmenting the employment. The monetary policy tools are money stock, interest rate and credit. The trade off between the intermediate targets of the monetary policy while targeting its ultimate goals have been analysed in describing the targets of the Central Bank.

3.8 Questions

- (i) Describe the factors which affect the monetary determination in an economy.
- (ii) What is money multiplier? How is it derived?

- (iii) Explain the money multiplier process.
- (iv) Explain the loanable funds theory of determination of equilibrium interest rate.
- (v) What are the criticisms against loanable funds theory?
- (vi) Critically evaluate the targets of a Central Bank in achieving policy goals.
- (vii) How would you describe the relationship between money, credit and interest rate?

3.9 References

- (i) Gupta, Suraj B., Monetary Economics—Institutions, Theory and Policy, S. Chand & Co. Ltd.; 1995.
- (ii) Dornbusch, R. and Fisher, S. Macroeconomics, 4th Edition, Mc. Graw Hill International Editions, 1987.
- (iii) Mankis, N. Gregory, Macroeconomics, Fifth Edition, Worth Publishers, 2003.

Unit 4 □ Business Cycles and Macro Economic Policy

Structure

- 4.0 Objectives**
- 4.1 Introduction**
- 4.2 Business Cycles : Basic Concepts and Simple Explanations**
 - 4.2.1 How the Economy Moves**
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 - 4.2.3 The Business Cycle**
 - 4.2.4 Different Theories for Business Cycles**
- 4.3 Economic Policy**
 - 4.3.1 Activist versus Non-Activist Policy**
 - 4.3.2 Rules versus Discretion**
 - 4.3.3 Rules for Monetary Policy**
 - 4.3.4 Rules for Fiscal Policy**
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- 4.5 Questions**
- 4.6 References**

4.0 Objectives

By the time you have studied this unit you should be able to :

- Explain what is business cycle.
- Explain different views of business cycle.
- Explain different economic policies aiming at stabilization.

4.1 Introduction

The world has registered remarkable economic progress during the last 150 years or so. But it would be wrong to think that this economic progress has been a steadily upward swing. In fact, there have been continuous ups and downs. In this unit, we will first discuss, in detail, the basic concept of a business cycle and then we will move on to discuss the various theories which explain such cycles. Here we have explained only four popular theories regarding the business cycles : those of Marx, Keynes, Samuelson and Hicks. It

must be mentioned here that the Marxian ideas are very much specific to the Marxian scheme of analysis, which is quite different from the mainstream economic analysis including the Keynesian analysis. The notion of business cycles involves long run analysis of output growth and fluctuations. However, Keynes himself did not offer any long run point of view. According to him, long run is summation of different short runs only, nothing more than that. Although he did not offer any long run analysis of output growth and fluctuations the later Keynesians, that is, those who adhere to Keynesian doctrine, provided some long run analysis of output growth and fluctuations, which came to be known as Keynesian business cycle theory. Then in the next section we have discussed about the various economic policies, which used to stabilize an economy from cyclical fluctuation. In doing so, we have focused on the various debates pertaining to different policies. Starting with the debate of active policy vs. passive policy, we have discussed whether to use a policy rule or to use discretionary policy measures. At last, we have specified some rules for monetary and fiscal policy.

4.2 Business Cycles : Basic Concepts and Simple Explanations

The long run expansions of industrialized market economics have been accompanied by cyclical fluctuations in the economic activity. The type of fluctuations is known as the business or trade cycles. In general, the feature of a business cycle is an expansion of economic activity followed by a contraction, which is, in turn, succeeded by further expansion. In the expansionary phase, we find an upward trend in the growth of real national output, which rises at a faster pace, when the economy just emerges from recession, but gradually slows down as it reaches the upper turning point of the cycle.

4.2.1 How the Economy Moves

A close look at our economy suggests that its growth path is not always smooth. It grows in 'fits and starts'. Periods of rapid growth alternate with periods of slower growth or even contraction. These economic fluctuations are most commonly recognized by their effects on unemployment, sales and the behaviour of prices—in particular the rate of inflation.

4.2.2 Growth and Fluctuations

Some idea about the way by which the economy moves is conveyed in figure 4.1 (a) shown by the graph of real GNP since 1929. Two things are obvious in the U.S.A. : one, economy grows over time and second, there are irregular fluctuations in its rate of growth one year to year. The size of these fluctuations is further illustrated by the graph of annual percentage change in real G.N.P. over the period of time, in figure-4.1 (b).

In the graph it is shown that since World War II, these fluctuations have been less evident than those of 1930's or 1940's.

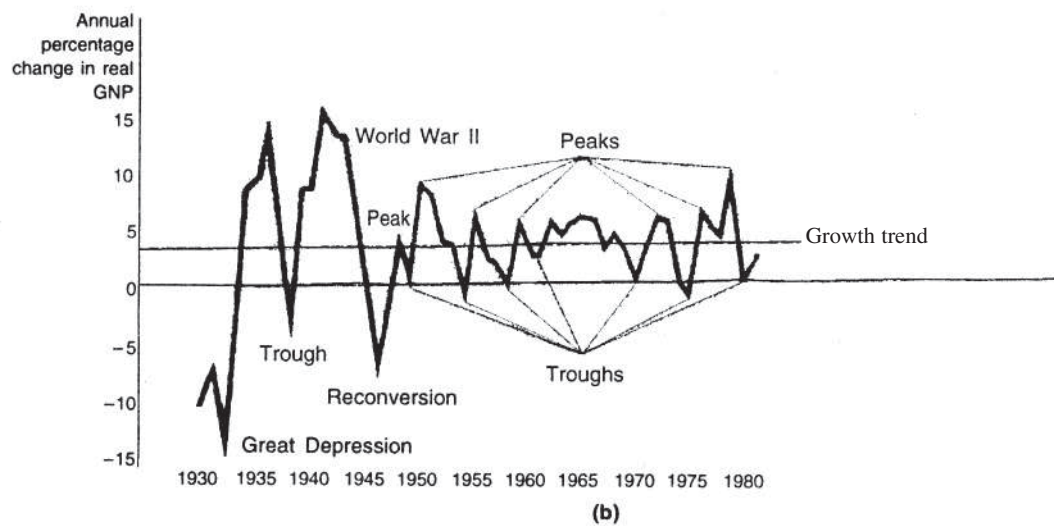
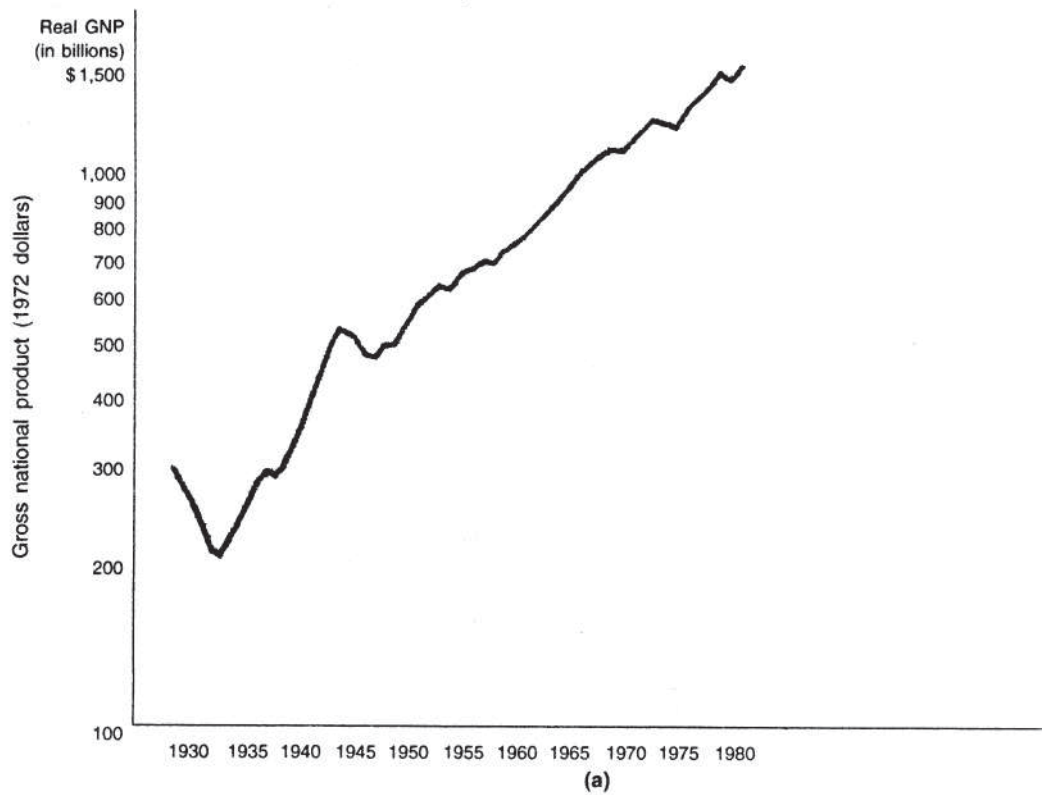


Figure 4.1

4.2.3 The Business Cycles

The fluctuations in real GNP, which are indicated in figure 4.1(b), are known as business cycles. Comparing part (a) and (b), we find that business cycle is a phenomenon quite separate from the growth trend in its aggregate measure. The growth trend is represented by the horizontal broken line in the bottom graph. The business cycles during this period are represented by the irregular but recurrent up and down movements of the saw-toothed solid line about the trend. In general, business cycles are irregular but quite recurrent patterns of fluctuations in economic activity. They appear in aggregate measures of sales, output, income, employment and host of other measures over a period of years, quite apart from any long-run trend in the series.

Phases of Business Cycles

In figure 4.2 we have plotted the trend in output against time. From the graph we observe that the cyclical fluctuations in output occur about the long run trend growth in output. Comparing the figures 4.2 and 4.1, we find real world and hypothetical business cycles are not same. Real world business cycle does not follow any particular pattern; they vary with respect to different time periods.

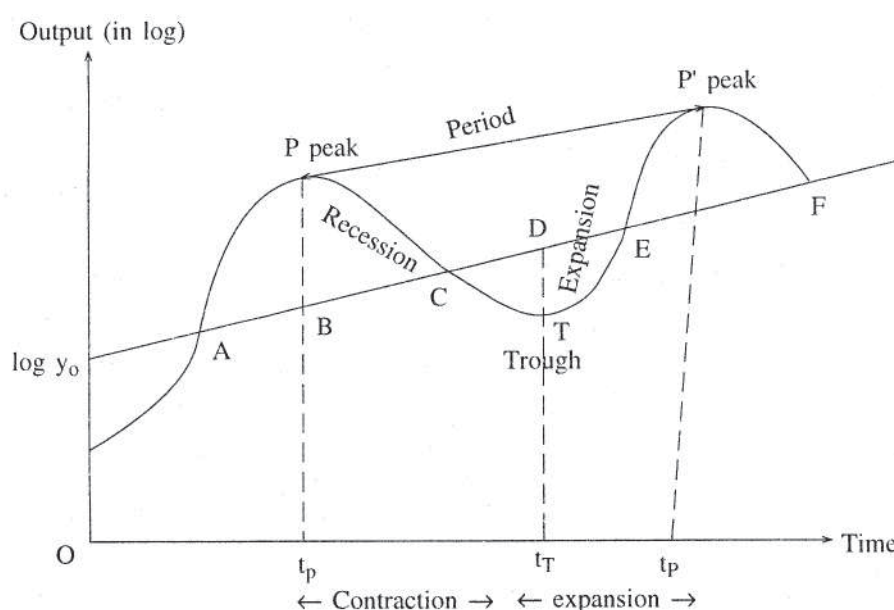


Figure 4.2

In a hypothetical business cycle, there are, in general, four phases : peak, recession, a trough and an expansion.

The Recession

This phase corresponds, not only to falling GNP but also to the falling level of employment. As a result, unemployment increases on a large scale. Investment decreases causing a further fall in consumption of goods and services, and hence, reducing the aggregate demand in the economy. Further, it leads to a fall in price level due to fall in the aggregate demand, thereby reducing inflation further. When recession is severe it is called depression, such as the Great Depression of 1930's, noted in Fig. 4.1.

Trough

The lower turning point of the business cycle is often called the trough. At this point, economic conditions are at low ebb and are accompanied by low output and huge unemployment. Generally, a trough does not last for a long duration because an expansionary phase quickly follows it.

Expansion or Revival

During this phase unemployment falls and all other economic variables such as sales, income, output and capital formation rise. This phase is often characterized by progress in technology, which makes the existing capital stock obsolete. Generally, when a banking system starts expanding its credit and when there is a spurt in investment activity, old capital gets replaced, and new investments are made, which increase the output and employment, thus bringing revival or recovery in the economy.

Peak

This phase is often also called the "Boom". Here, output, income, sales and capital formation reach the highest levels while unemployment falls to its lowest level.

Now let us have another look at Fig. 4.2. The slope of the line shows the rate of growth at any point of time whereas the slope of the line ABCDEF shows the trend rate of growth of output. The peaks, shown by point P and P', have occurred at the dates when actual rate of growth of output is above the trend rate of growth of output [after being equal at point A and C]. Similarly, the trough, shown at point T occurs when the actual growth rate has been below the trend growth rate.

A business cycle has two basic dimensions : One is amplitude, which measures the extent of the maximum duration of the actual growth rate from trend growth rate and is defined as half the distance between the peak and the trough.

The second dimension of the cycle is its time dimension. The period of the cycle is defined as the time it takes to move from a peak (trough) to the next peak (trough). Thus the time path, PCTEP', of a complete cycle can be divided into two phases. One is contraction and the other is expansion. Contraction is defined as the period of time, in

which the actual rate of growth is less than the trend rate of growth. This path shown by PT occurs during the time period $t_P - t_T$. The expansion occurs when the actual rate of growth is greater than the trend rate of growth and happens over time period, $t_P - t_T$.

Features of Business Cycles

- (1) Business cycle occurs periodically.
- (2) Business cycles are synchronic. That is, they do not cause change just in any single industry or sector but affects the whole economy.
- (3) Another important feature of business cycle is that investment and consumption of durable consumer goods are affected mostly by cyclical fluctuations.
- (4) Consumption of non-durable goods and services does not vary much during different phases of business cycles.
- (5) The variable which fluctuates most during business cycle, is the profit compared to any other type of income.
- (6) Lastly, business cycles are international in character. That is, once started in one country they spread to other countries trade relations between them.

4.2.4 Different Theories for Business Cycles

(1) Marxian Theory of Business Cycles

The noted philosopher Karl Marx predicted the collapse of the capitalist system due to emergence of under-consumption. He predicted that the simultaneous expansion and contraction will continue in a business cycle with each peak higher than its previous peak and each crash deeper than the last. According to Marx, the driving force behind business cycle is increasing income inequalities between rich capitalist and poor workers. As a result, purchasing power of the poor workers fall, resulting in under consumption along with the contraction of the market. But this contraction in market may lead to severe depression. But later with the discovery of new method of production and opening up of new market the economy starts to recover again.

According to Marx, every society must somehow direct the labour time at its disposal toward the production of the goods and services necessary to sustain and reproduce itself. In the case of class societies, the reproduction of the ruling class requires that it be able to extract a surplus product from the subordinate classes. This means that every ruling class must somehow get the subordinate classes to work beyond the time necessary to produce their own means of consumption, for it is this surplus labour which creates the requisite surplus product. The process remains hidden in capitalist society under the surface of exchange relations and money magnitudes. Marx assumes that the money price of each commodity is proportional to the total abstract labour time necessary for its production (its

labour value). In the case of wage labour, wages are proportional to the number of hours (v) workers must put in a given day in order to produce their collective daily means of consumption. Under the above circumstances, all commodities, including labour power exchange in proportion to the labour time socially necessary for their reproduction. During the production process a particular quantity of means of production is used up each day. The abstract labour time (c) which was previously required to reproduce them is thereby transferred to the product. If we add to this the labour time worked by workers in a given day (1), the resultant sum ($c + 1$) represents the total abstract labour time socially necessary to produce the daily product. If exchange is proportional to labour times, then the price of the product is proportional to ($c + 1$). But the corresponding money cost of producing this product is proportional to ($c + v$), since c represents the abstract labour cost of the means of production used up and v represents the corresponding costs of the workers employed. It follows from this that aggregate profits will exist only if $(c + 1) > (c + v)$, which implies $1 > v$. In other words, when prices are proportional to labour values (equal exchange), profit is the direct monetary expression of surplus labour time $s = 1 - v > 0$. This surplus labour time, performed by workers who produce commodities for capitalists, is what Marx calls surplus value. The Marxian scheme is based upon the concept of surplus value. It can be shown extraction of surplus value in capitalist societies leads to overproduction time to time.

According to Karl Marx, capitalist economic crises are always crises of overproduction of commodities. These commodities at times find no buyers. This unleashes a spiral movement of collapse of firms, firing of workers, contraction of sales (or orders) for raw materials and machineries, new redundancies, new contraction of sales of consumer goods etc. Through this prices collapse, production and income get reduced, capital loses value. At the end of the declining spiral, output (and stocks) has been reduced more than purchasing power. Then production can pick up again; and as the crisis has both increased the rate of surplus-value (through a decline of wages) and decreased the value of capital, the average rate of profit increases. This stimulates investment. Employment increases, value, production and national income expand, and we enter a new cycle of economic revival, prosperity, overheating and the next crisis. For Marx, periodic crises of overproduction are unavoidable under capitalism.

Criticisms :

There are many features other than growing income inequalities which are responsible for recession and thus Marx in under-consumption theory may be regarded as too simple in explaining the fluctuations of a business cycle.

(2) Keynes's Theory of Business Cycles

Keynes's theory is based on the effects of the aggregate effective demand. He assumed that any change in the level of aggregate demand will bring about fluctuations in

the level of income, output and employment. While a rise in aggregate demand will result in increase in output and income, a fall will reduce its output and employment. Any change in aggregate demand, according to Keynes, is due to fluctuations in investment demand, [though consumption demand later has a role to play]. Let us now briefly explain the Keynesian business cycle starting from the recession. It must be mentioned here that Keynes himself did not offer any theory of business cycle. Because Keynesian analysis of output and employment determination is essentially a short run analysis. But business cycle is a long run concept. The followers of Keynes later put forward some analysis of cyclical ups and downs in an economy based on Keynesian framework. Their basic tool of analysis is the concept of Keynesian multiplier. Multiplier analysis attempts to answer what is the effect of a change in the level of investment? The main effect of an increase in investment is that it induces an increase in consumption, savings and income. The final effect on the level of income will depend on the propensity to consume of the economy. Keynes argued that aggregate consumption expenditure is a stable function of aggregate income in an economy. This can be expressed in functional form as $C = C(Y)$, where C and Y denote aggregate consumption expenditure and income respectively. The average propensity to consume is measured as consumption expenditure per unit of income, C/Y . The marginal propensity to consume (c) is the change in consumption expenditure attributable to one unit change in income, $\Delta C/\Delta Y$. Both average and marginal propensities to consume lie between 0 and 1. The greater the marginal propensity to consume, the greater will be the increase in the demand for consumption goods resulting from an initial increase in the income generated in the capital goods sector. The immediate effect on the demand for consumption goods will be $C = cI$ where C and I are respectively the levels of consumption and investment and c is the weighted average of the propensities to consume out of wages and profits. The immediate effect on the level of income will be given by $\Delta Y = \Delta I + c\Delta I$. Note that a second round of the multiplier process will lead to an increase in the level of income given by $\Delta Y = \Delta I + c\Delta I + c^2\Delta I$. In the limit the effect will be given by $\Delta Y = \Delta I + c\Delta I + c^2\Delta I + \dots = [1/(1 - c)]\Delta I$. The term $(1/1 - c)$ is called the investment multiplier. According to Keynes, multiplier tells us that, when there is an increment of aggregate investment, income will increase by an amount which is $(1/1 - c)$ times the increment in investment. During an expansionary phase, increase in demand for capital goods due to large-scale investment activity leads to rise in price of those goods. This increases the marginal cost of their production, which further reduces the marginal efficiency of capital as cost of investment project increases. Apart from this, interest rate also rises due to rise in money demand during expansionary phase, which causes further decline in investment. Apart from this a decline in income due to fall in investment also ends in reducing consumption demand. Reduction in consumption expenditure reduces income further via the multiplier effect which magnifies the effect of decline in investment expenditure on

aggregate demand. Moreover, the fall in the expected prospective yield from the investment projects induces a pessimistic expectation among businessmen, which further worsens the situation. Thus slowly the depression sets in, with very low level of investment and output at the trough. Now over the time from boom to recovery there will be necessary wear and tear of durable capital assets on the one hand, and on the other hand, there will be absorption of excess stock of goods. Thus the size of capital stock declines, resulting in scarcity of capital. This raises the marginal efficiency of capital, which, further, boosts investment. Once investment increases, it induces further rise in income and consumption demand through the multiplier process. Thus with increase in the aggregate demand the expectation of the businessmen also changes, which tends the stock prices back to its higher levels. All these factors work simultaneously to lift the economy out of depression and eventually tend to boom.

Criticisms :

The Keynesian theory of multiplier is the sole cause of business upswings and downswings. But a basic feature of the trade cycle is its cumulative character both on upswing as well as on downswing. According to this character once the economic activity starts rising or falling, it gathers momentum and grows in that direction for a time. This feature of the trade cycle is lacking in Keynesian theory.

(3) Samuelson's Model of Business Cycles

One of the drawbacks of the Keynesian theory is that Keynes did not explain the critical and cumulative nature of the fluctuation in economic activity. This is due to the reason that Keynes did not give any importance to the accelerator in his explanation of business cycles. Samuelson took this point and showed that the interaction between the multiplier and the accelerator actually gives rise to critical fluctuation in economic activity. The multiplier is defined as the ratio of increment in income to the increment in investment. If ΔI stands for change in investment and ΔY for change in income then the multiplier is expressed as

$$m = \Delta Y / \Delta I.$$

Further, if c is the marginal propensity to consume, then change in income, ΔY , is related to the change in investment by the following equation,

$$\Delta Y = \frac{1}{1 - c} \Delta I$$

Thus, the multiplier shows the magnitude of increase in income due to increase in investment.

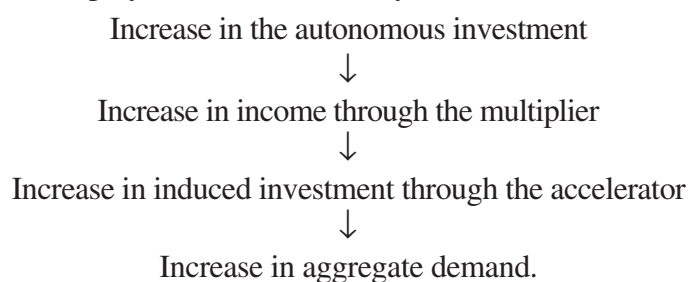
The accelerator, on the other hand, is the numerical value of the relation between the increases in investment, resulting from an increase in income.

In the accelerator theory, the capital-output ratio is used to represent the magnitude of the accelerator. That is, if K/Y is the capital-output ratio, then an increase in the capital

stock K via investment must occur in response to an increase in income Y , to keep the ratio K/Y constant. Thus, in the accelerator theory, investment is a function of income and an increase will result in an increase in investment.

The acceleration principle has been proposed as a theory of investment demand as well as a theory of determining the supply of capital goods. When combined with the multiplier, it has played a very important role in models of the business cycle. The main idea, underlying the acceleration principle, is that the demand for capital goods is a derived demand and that changes in the demand for output lead to changes in the demand for capital stock and hence, leads to investment. Underlying the acceleration principle is the notion that there is some optimal relationship between output and capital stock : if the output is growing, an increase in capital stock is required. In its simplest version of the acceleration principle $K_t^* = vY_t$ where K_t^* is planned capital stock, Y_t is output and v is a positive capital-output coefficient. Assuming that the capital stock is optimally adjusted in the initial period (that is, $K_t = K_t^*$ where K_t is the actual capital stock) an increase in output (or planned output) leads to an increase in planned capital stock, $K_{t+1}^* = vY_{t+1}$, and, again, assuming optimal adjustment in the unit period $K_{t+1}^* - K_t^* = K_{t+1} - K_t = I_t = v(Y_{t+1} - Y_t) = v\Delta Y_t$. In other words, for net investment to be positive, output must be growing : v is called the accelerator. The accelerator along with the Keynesian investment multiplier is used to explain the cyclical fluctuations in a capitalist economy. Note that $I_t = v\Delta Y_t = (v/1 - c)\Delta I_t$, where c is the marginal propensity to consume and $1/1 - c$ is the Keynesian investment multiplier.

In the model an autonomous increase in the level of investment raises income by a magnified amount depending upon the value of the multiplier. This increase in income further brings about an increase in aggregate demand for goods and hence results in further investment. Then there is a one to one relationship between investment and income. In the model investment affects income, which, in turn, affects investment demands, and in this process income and employment fluctuate in a cyclical manner.



One important point to note here is that the interaction between the multiplier and the accelerator without any external shocks can explain fluctuation in the business cycles where pattern differs depending upon the magnitude of marginal propensity to consume and capital-output ratio.

In this model, we assume consumption and investment both depend on income of previous periods. Now for various values of marginal propensity to consume, c , and the capital-output ratio, v , and by different combinations of these values, Samuelson actually described different paths the economy might follow. The different combinations of the marginal propensity to consume and the capital-output ratio are shown in figure 4.3.

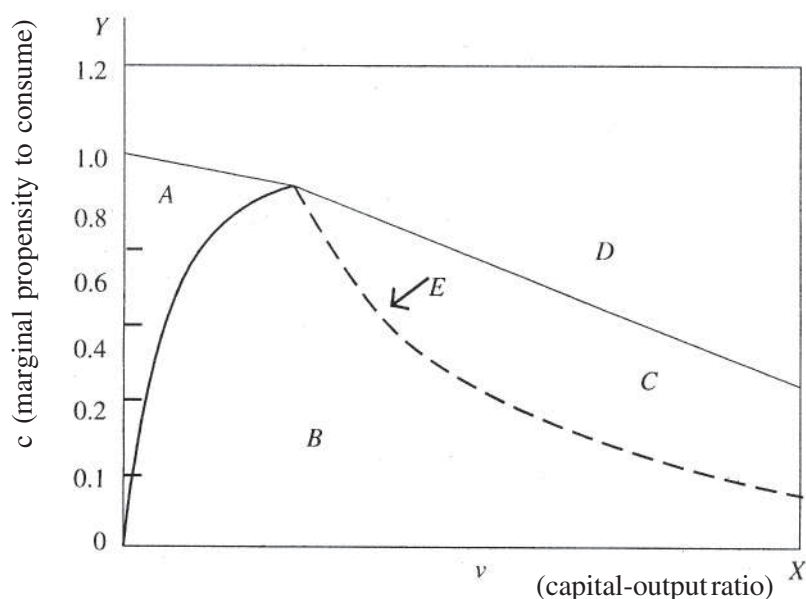


Figure 4.3

Further, the different patterns of income movements depending upon the various values of marginal propensity to consume (c) and capital-output ratio (v) are shown in Fig. 4.3. When the value of the marginal propensity to consume (c) and the capital-output ratio (v) are such that their combination lies within the region marked A, then with a change in autonomous investment, initially the GNP moves upwards slowly at a decreasing rate, until it reaches a stable equilibrium as shown in panel a of figure 4.4. If the values of c and v lie within the region B, then a change in autonomous investment will generate fluctuation in income which will follow a pattern of damped cycle, whose amplitude goes on declining until the cycle disappears as shown in panel b of Fig. 4.4. Thus regions A and B are alike in a sense that an initial autonomous investment finally brings about a stable equilibrium in the system. The specific feature of region B, where combination of the values of c and v produces damped cyclical fluctuations, is that the amplitude of the cycles shrinks to zero over a period of time, which contradicts the traditional business cycle theories. But this kind of behaviour actually highlights a cone time increase in autonomous investments where impact slowly dies over time.

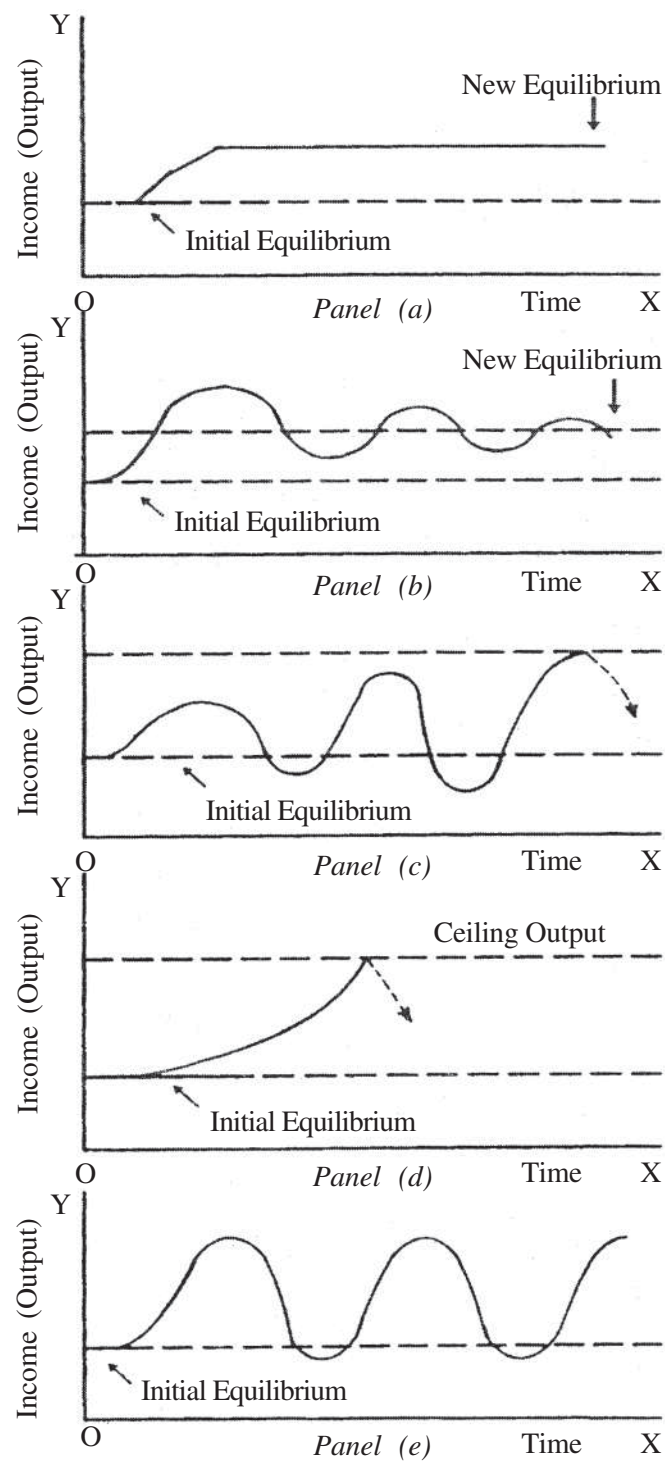


Figure 4.4

The region C in Fig. 4.3, represents combinations of c and v , which are relatively high and their combination brings about an explosive cycle. This situation is shown in panel (c) of figure 4.4.

The region D provides the combination of c and v , which causes income to move upward or downward at an increasing rate and here also the system tends to explode, as shown in panel (d) of 4.4. Both the region resembles each other but both of them cause great instability to the system as well because both of their values tend to diverge away from the equilibrium level.

In the case, where the values of c and v lie in the region E, we find cyclical fluctuation with constant amplitudes as shown in panel (e) of Fig. 4.4. Here the cycles will be much similar to the basic traditional business cycles. But real world situation would not match with this kind of fluctuation in general. Business cycles in real world do never have same amplitude and duration. Thus following the Samuelson's explanation the cyclical and the cumulative nature of fluctuations in economic activities can be accounted for.

(4) Hicksian Theory of Business Cycles

In the previous theory, we have conveyed the idea that the interaction between the multiplier and the accelerator gives rise to fluctuations in total national income. We have taken different values of marginal propensity of consume, c and accelerator, v and explained different magnitude of fluctuations.

Hicks' analysis is quite close, or, in fact, largely related to Samuelson's argument except for the fact that Hicks assumed that there is a limit to the increase in national income set by the full employment ceiling.

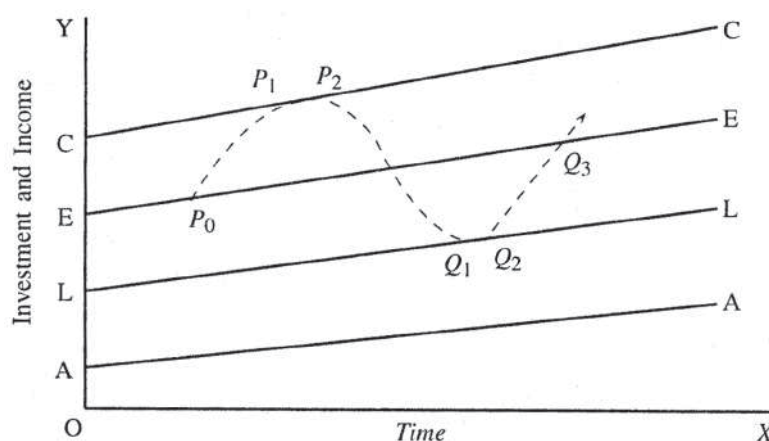


Figure 4.5

The above diagram will help us in understanding the different phases of the Hicksian trade cycle. In figure 4.5, AA is the line representing autonomous investment which grows

annually at a rate given by the slope of the line AA. Given the marginal propensity to consume, c , the multiplier is determined, which together with the autonomous investment, determines the equilibrium level of income shown by the line LL. Now with growth in income along the line LL, there will be increase in some amount of investment due to rise in income via the accelerator. The line EE shows the equilibrium time path of national income determined by the combined effect of the accelerator and the multiplier, EE is the full employment ceiling as assumed by Hicks.

Let the initial position of the economy be at point E. When the economy reaches point P_0 along the path EE, we assume that there is a jump in government's investment. This jump via multiplier effect increases income and output further and shifts the economy above EE. This increased national income further raises 'induced' investment through the acceleration effect. Thus under this combined effect, output will rapidly increase until it reaches P_1 . But at P_1 due to full employment ceiling [may be due to limited human resource] further expansion of national income is not possible. Prof. Hicks assumes that the growth rate of full employment ceiling is same as the rate of growth of autonomous investment. So at P_1 the economy grows at the same rate as usual growth of autonomous investment and crawls to P_2 . So there is a rapid decline in growth rate. But the decrease in rapid growth rate of national income will reduce investment via the accelerator. The sharp decline in investment will result in contraction in the level of income and business activity and the economy will move towards EE. Investment falls rapidly and the multiplier works in the reverse direction. This fall in output will continue further until it reaches point Q_1 . At this point, national income will not fall any further because this is the equilibrium level where the accelerator will stop working and thus prevent further reduction in investment due to fall in income. But the multiplier will still be at work and so there will be a growth of income from Q_1 to Q_2 , and this will induce further investment, so that both the multiplier and the accelerator will come in operation again.

4.3 Economic Policy

Looking at the fluctuations in the general business cycles, governments and the central banks use various monetary and fiscal policies to smooth out the fluctuations that may arise in the economic growth path. Governments are always ready to use various economic policies to stabilize the economy whenever necessary. At times when the economy finds itself in the grip of recession, when the level of national income, output and employment are far below their full potential level, then the government or the central bank uses various

expansionary monetary and fiscal policies, like cut in the tax rate or increase in government expenditures or rise in money supply. A brief example of how such fiscal policy may work is given below.

Suppose the economy is facing a recession. And this income, output and employment level in the economy will be very low. In such a recessionary situation, the fiscal policy in front of the government will be either to cut tax or increase the government expenditure. This is because, both tax cut and increase in government expenditure, will increase the income of the people directly or indirectly via the multiplier and hence increases aggregate demand, which will further increase income and output.

Similarly, during the boom period when, we can expect rising inflation, a government will stick to certain contractionary fiscal policies like increasing tax or reducing government expenditure, which will reduce the aggregate demand in the economy thus reducing the inflationary pressure which was generated due to such increase in aggregate demand. [We should be careful that when the economy is at boom, then it is already having full employment of its resources and thus an increase in demand will only lead to a rise in price because further output increase is not possible.]

But, in reality, we can not exactly be certain about the behaviour of these policies, in helping the economy to reach its desired level of output. Actually, various uncertainties can be observed about the functioning of these policies.

Practically, it is observed that the government is not always aware about the exact situation of the economy, because it may not know the expectations, which the firms or the consumers may be having.

We will provide a simple example to show how the inappropriate knowledge of expectation may lead to undesirable effect of a fiscal or monetary policy.

Suppose that because of weakness in the economy, the government decides to cut tax. Now the government has to guess how the public will react to such a temporary tax cut. One possible behaviour of the public due to tax cut may be to raise permanent income by a very little amount and hence increasing spending only by a small amount.

If the public behave in this manner then it will imply that the government has to impose a large tax cut in order to stabilize the economy. But, on the other hand, a different expectation on part of the consumers, expecting tax cut to last for a much longer duration than the government has announced, may increase their propensity to spend all of the tax cut. Thus, if the public has this kind of expectation then the government will require having a smaller tax cut to stabilize the economy. Thus if the government is wrong in its guess

about consumers' reactions, it would not deliver the desired outcome. Often it becomes difficult to forecast disturbances such as changes in the price of oil. They may also allow to disturb the economy before policies take effect.

This kind of uncertainties actually can lead to inappropriate or fluctuating values of multipliers, due to which outcome of a policy may not be certain.

4.3.1 Activist Policy versus Non-Activist Policy

The lists of difficulties in the way of successful policy making have raised the question about efficacy of policies in reducing the fluctuations in the economy.

By an activist policy we mean those policies which respond instantaneously to any disturbance in the current state of the economy. Arguments presented before, about the reaction of the government in accordance with the current state of the economy, may be regarded as the activist policy of the government. Activist fiscal or monetary policies are continuously engaged in "fine tuning" the economy in response to any small disturbance. By fine tuning, we mean deliberate government interventions to keep the GDP on a steady growth path.

But apart from the view of activist policy makers, there is another school in which Milton Friedman and others have argued that there should be no use of counter cyclical fiscal or monetary policies in response to a particular disturbance in the economy. Friedman suggested that, over the long run monetary growth should be kept constant and policies should not respond to such small disturbances. In doing so, the economy will not deviate from a steady course and hence the monetary authority would succeed in attaining economic stability.

The argument put forward by these economists is that there exists two lags, which influence the performance of any monetary and fiscal policy. One is called the inside lag and the other is called the outside lag. The inside lag refers to the time between any shock and the probable actions undertaken by the government in response to it. The lag arises because policy makers take sometime to recognize a particular shock and choose an appropriate policy to rectify it.

On the other hand, the outside lag is the time between a policy action and its influence on the economy. Spending or income is not immediately affected by a policy. It takes sometime for these policies to have desirable effects on these variables. This is called outside lag.

The proponents of passive policy suggest that due to these lags often the attempt to stabilize the economy leads to destabilization. A simple example will show how an active policy may lead to destabilization. Suppose, an economy has been suffering from deflations

six months ago. But at present price is at quite a high level. Suppose the government takes some policy to increase the price level six months before. But due to these lags the policy did not effect any change at that time. The price level is affected now and this would tend to raise the price further. Thus these policies to stabilize the economy are actually destabilizing the economy at present.

Due to these reasons advocates of passive policy favour a “hand-off” approach by the government towards macroeconomic policies. But depending totally on passive policies to recover an economy from a state of recession is also not correct. In cases when major disturbances occur, active policies should be used. For example, during 1930s the government should have followed an expansionary fiscal policy i.e. either a tax-cut or increase in government expenditure. Actually, in such a situation even the government may be aware of the uncertainties with regard to the use of such policies. But still during such grave conditions activist policies will, obviously, increase income or employment at least to a certain level, if not fully at the desired level.

Active policy may also be used overcome small fluctuations if they are due to some permanent distortions, as judged by the central bank. But in case of small fluctuations due to certain transitory or temporary factors the best policy would be to remain passive.

But a major controversial argument suggests that policy makers, if allowed to do anything, may perform in a much-aggressive manner instead of pursuing the policies, just required to offset a small disturbance. They may overreact, and that may lead to instability. This gives rise to a new debate pertaining to the use of a particular rule in using policy or whether to use discretionary measures.

4.3.2 Rules Vs. Discretion

The debate regarding rule vs. discretion arises due to the unpredictable behaviour of the policy makers. So, the economists argue that if policy makers are allowed to pursue discretionary policies to promote the political interests of their bosses in the election time particularly, the general interests of the public may be at stake. Distrust of the political process has led some economists to advocate policies to remain outside the realm of the political process and thereby, to construct certain rules for policy-making. However, the Keynesians argue in favour of the discretionary policy.

When the policy makers or the central bank announces a particular strategy, which they will follow at any given period and sticks to that in the specified time period, then it can be said that the economic policy is conducted by a rule.

On the other hand, discretionary policy refers to choosing the best policy given the current scenario. For example, in an inflationary situation the government must use anti-inflationary policy. Issues of rules vs. discretion is often clouded by the fact that most of the proponents of the rules are non-activists. But such idea does not stand because activist rule can be framed in accordance with the change in economic condition. Proponents of discretionary policies always give more importance to the fact that financial system responds very quickly to shocks and so, they believe that it is essential for policy-making body to have considerable discretion and flexibility to respond to the disturbances.

More recently, the proponents of rule have showed that discretionary policy may lead to sub-optimal situation from the long-run point of view. We have seen in the short run if money supply is increased then inflation will follow. Output will rise and unemployment will fall. But in the long-run due to the adjustment in inflationary expectation the economy, again, returns to the initial level of output and employment with a higher level of inflation than before. This is sub-optimal to the society. Instead, if the government would have selected a rule then on the assumption that people are rational would lead to a better outcome. This argument is put forward by the new-classical economists who presume that people are rational and hence their expectations are also rational.

4.3.3 Rules for Monetary Policy

(i) Generally economists suggest three basic rules in formulating a monetary policy. One basic rule generally suggested by the monetarists is that the central bank should keep the money supply growing at a steady rate. They believe that the fluctuations in money supply are responsible for large fluctuations in an economy. Constant growth of money supply would prevent such fluctuations.

But some economists criticize this rule. They argue that the velocity of money (that is, the rate at which money changes hand) may some time be unstable and thus the policy rule should allow money supply to adjust accordingly to maintain its steady growth.

(ii) Secondly, it is proposed that the central bank should announce a planned path for nominal GDP. If the nominal GDP rises above the target the central bank should reduce the money supply to dampen the aggregate demand which will pull back GDP to its target level and vice versa.

(iii) A third policy rule is to target the price level. The central bank announces a target price level and then adjusts the money supply when the actual price level deviates from the target.

Apart from targeting the nominal variables like money supply, nominal GNP, price level, the central bank can also target real variables. But generally targeting real variable is quite a complex matter. For example, no one knows exactly what the natural rate of unemployment is and, therefore, targeting it at an assumed level may further destabilize the economy. Due to this reason, the economists avoid targeting real variables.

4.3.4 Rules for Fiscal Policy

Though the economists and politicians give more importance to rules for monetary policy, they often propose a rule for fiscal policy. One possible rule is the balanced budget rule. Under this rule, the government is not allowed to spend more than it receives from tax revenue.

But many economists criticize this rule. They generally put forward the following three reasons :

1. In an economy there are certain automatic stabilizers like the income tax which changes according to the change in economic situation. For example, during recession they fall while rise during boom. During recession government actually has to increase its spending. Therefore, in order to maintain balanced budget taxes must be increased. But during recession, this may further destabilize the economy.
2. Unstable or frequently changing taxes often impose a large social cost. So total social cost is minimized by keeping the tax rate relatively stable rather than changing them frequently to maintain balanced budget.
3. A budget deficit can often be used to shift a tax burden from current to future generation which sometimes may be essential during emergency situations like wars.

These arguments often lead many economists to reject the fixed balanced budget rule.

4.4 Let Us Sum Up

We have learnt that a capitalist economy is subject to cyclical fluctuations known as business cycles. There are different theories of business cycle. Marxian view explains it in terms of under-consumption hypothesis. The Keynesian view explains it in terms of lack of effective demand. Samuelson explains it in terms of multiplier-accelerator framework. Hicks, on the other hand, differs from Samuelson in terms of full employment ceiling causing the fluctuation.

Economists differ in terms of their prescriptions for stabilization policies. While Keynesians favoured discretionary fiscal policies, monetarists argued in favour of non-discretionary rules. Believers in new classical school, on the other hand, favoured a “hand off” approach for the government as far as the economic policy is concerned.

4.5 Questions

- (i) What do you mean by business cycle?
- (ii) Explain different phases of business cycle.
- (iii) Critically evaluate Marxian theory of business cycle after explaining the concept of surplus value.
- (iv) What is multiplier? Explain the Keynesian theory of business cycle.
- (v) What is accelerator? Explain how Samuelson explained business cycle in terms of multiplier-accelerator model.
- (vi) What is the Hicksian view on business cycle?
- (vii) Distinguish between activists versus non-activist economic policy.
- (viii) What are the rules for monetary policy?
- (ix) What are the rules for fiscal policy?

4.6 References

- (1) Mankiw, N Gregory, Macroeconomics, Worth Publishers, fifth edition 2003.

Unit 5 □ Basic Characteristics of Open Economy

Structure

5.0 Objectives

5.1 Introduction

5.2 National Income Accounting in an Open Economy

5.3 The International Flows of Capital and Goods : Small vs. Large Open Economy

5.4 Let Us Sum Up

5.5 Questions

5.6 References

5.0 Objectives

By the time you have studied this unit you should be able to :

- Explain the national income accounting in an open economy context;
- Explain the inter-relationships between real and nominal macro-variables in an open economy context;
- Explain the international flows of capital and goods in both small and large economy context.

5.1 Introduction

Before we move on to study the various relationships which exist between different economic variables, we must first measure the values of these variables. In this unit we will discuss how to measure the national income of an open economy. But measuring national income will also require measurement of other important variables like GDP, GNP to gauge the actual performance of the economy.

In the first part of the unit, we will try to find how all these variables could be measured. Thereafter, we will make a simple framework, with the help of which we will study the various relationships which exist between different macro economic variables in an open economy.

In the final section, we will try to make a comparative analysis of the factors which are responsible for guiding the capital flows in a small open economy and large open economy. There we will see that, in general, an expansionary fiscal policy would lead to capital inflow, whereas a contractionary policy is associated with capital outflows.

5.2 National Income Accounting in an Open Economy

The ultimate goal of Macroeconomics is to determine an economy's level of output, employment, interest rates and various other macro economic variables, which help to

determine an economy's progress. To understand elaborately about these economic variables we must, first, understand how to measure these variables in practice. National income accounting deals with various procedures to measure these variables.

Let us first start our discussion by looking into some of the basic concepts of National Income Accounting. Then, after this, we will deal with some simple national income identities in an open economy.

(i) Gross Domestic Product :

GDP is defined as the value of final goods and services produced within the domestic territory of the country within a given period.

We consider only final goods and services to avoid the problem of double counting. GDP values goods at market price. If we want to get the value of GDP at factor cost then we will have to subtract indirect taxes from GDP calculated at market price.

(ii) Calculating Net Domestic Product :

We can obtain Net Domestic Product (NDP), if we subtract the capital consumption depreciation, from GDP. NDP thus excludes the wear and tear of capital and includes only the net amount of goods produced in the country.

(iii) Gross National Product :

GNP is defined as the value of final goods and services produced by the domestically owned factors of production within a given period.

In case of GNP, we include value of all goods and services, which are produced by domestic factors of production, though these may be produced in foreign territories. An example will make it clear.

Indian GDP will include the profits that are earned by a Japanese manufacturer producing in India, as production is made within the domestic territory of India. But the profit of the Japanese firm will not be included in the GNP of India; rather it will be included in the GNP of Japan.

(iv) Calculation of National Income in an open economy :

National income is net national product at factor cost. We can obtain national income from the GDP in the following way :

$$\text{GDP} + \text{Net factor payments from abroad} = \text{GNP}.$$

$$\text{GNP} - \text{Depreciation or capital consumption allowance (CCA)} = \text{NNP at market price}.$$

$$\text{NNP at market price} - \text{Indirect business tax} = \text{NNP at factor cost or National Income}.$$

GDP and Personal Disposable Income :

GDP measures the overall output produced in the economy. Corresponding to this output, income is received by owners of factors of production. Personal disposable income is the level of income available for spending and saving by households in the economy.

Personal Disposable income = GDP + net factor income from abroad – depreciation – retained earnings – taxes + transfer payments i.e., we add those items which increase the spending capacities of individuals and subtract those, which reduce spending power.

With this let us now construct a simple framework which will help us to analyse the various relationships between the important macro economic variables in an open economy.

In our economy let us suppose that there are five sectors, namely private sector, government sector, banking sector, the central bank and the foreign sector and six markets or transactions categories. The total framework is shown in the table below. The symbols are explained in the text.

Table 5.1

Market \ Sectors	Private	Government	Banking	Central Bank	Foreign	Row Total
Goods and Services	I-S	G-T	—	—	Exp-Imp	0
Domestic Monetary Base	ΔH_p		ΔH_b	ΔH_c		0
Domestic Bank Deposit	ΔD_p		ΔD_b			0
Domestic Securities	ΔN_p	ΔN_g	ΔN_b	ΔN_c	ΔN_f	0
Foreign Money			ΔR_b	ΔR_c	ΔR_f	0
Foreign Security	ΔF_p		ΔF_b	ΔF_c	ΔF_f	0
Column Total	0	0	0	0	0	

Now let us make a brief analysis of each sector and modes of transaction. The private sector includes the producing and household sector.

The private sector includes all transactions that do not belong to any other sector. The government sector refers to general government and includes all departments, establishments and agencies of the country's central, regional and local governments.

The banking sector includes commercial banks and financial institutions.

The central bank is the apex bank within the country holding high-powered money base. The foreign sector includes all non-residents. Now let us focus on the type of transaction. The transactions on goods and services constitute the real markets.

The market concerning domestic money formulates the monetary base and bank deposits. The monetary base, generally the liability of the central bank and the demand deposits, consists of mainly the deposits held by the private sector in the banking sector.

The national securities include all other financial assets which are not included as money. It also includes any form of marketable debt instrument.

We consider both cash and deposits exchanged by the foreign residents as foreign money. And foreign securities are the securities issued by the foreign governments.

The sum of rows, in the table (Table 5.1), is seen to be zero. This shows that the excess demand for an item by a particular sector is exactly equal to the excess supply from other sectors, thus making their sum equal to zero.

The sum of each column in the table is also equal to zero. This reflects the fact the receipts and outlays of a particular sector are also same. Thus, an accounting link is established between the real and financial flows for every sector.

Now, let us analyze the relations that are present within an open economy between various macro-economic variables.

The first row gives the relation, $(I - S) + (G - T) + (\text{Exp} - \text{Imp}) = 0$
or $(\text{Imp} - \text{Exp}) = (I - S) + (G - T)$ (1)

Here I and S are private sector investment and savings respectively, and $(I - S)$ shows excess of investment over savings; and $(G - T)$ shows the budget deficit with G and T being government expenditure and tax revenue respectively and $(\text{Export} - \text{Import})$ is the trade balance. Thus equation (1) shows the relationship between the current account balance and budget deficits and shows that the current account deficit increases with government deficit. Conversely, the current account improves if the budget deficit is reduced.

Now if we define savings as $S = Y_d - C$ or $Y - T - C$ where Y_d is the disposable income and C is consumption and T is tax and substitute it in equation (1), then we can easily derive the basic macro economic identity :

$$Y = C + I + G + (\text{Exp} - \text{Imp}).$$

The derivation is shown below :

$$(I - S) + (G - T) = \text{Imp.} - \text{Exp.}$$

$$[I - (Y - T - C)] + (G - T) = \text{Imp.} - \text{Exp.}$$

$$I - Y + C + G = \text{Imp.} - \text{Exp.}$$

$$\text{Or } Y = C + I + G + (\text{Exp.} - \text{Imp.}) \dots \dots \dots (1a)$$

This shows that in an open economy, the total amount of real output produced is the sum total of consumption spending, investment spending, government spending and net exports.

The second row shows

$\Delta H_p + \Delta H_b + \Delta H_c = 0$ where H_c is the domestic monetary base, H_p is the currency with public and H_b is the bank's monetary base.

$$\text{Or } \Delta H_c = - (\Delta H_p + \Delta H_b) \dots \dots \dots (2)$$

The second relationship shows that the domestic monetary base (H_c) issued by the central bank is held by the private sector and the banking sector.

The third row gives that

$$\Delta D_p + \Delta D_b = 0$$

where D_p and D_b denote private sector's and banking sector's demand deposits respectively.

$$\text{Or } -\Delta D_b = \Delta D_p \dots \dots \dots (3)$$

This shows that only private sector holds the deposit which are issued by the banking sector.

Here it should be noted that the central bank does not hold any deposit with the banking sector and any deposit with the central bank is considered as monetary base.

The next row shows that,

$$\Delta N_p + \Delta N_g + \Delta N_b + \Delta N_c + \Delta N_f = 0$$

$$\text{Or } \Delta N_g = -(\Delta N_p + \Delta N_b + \Delta N_c + \Delta N_f) \dots \dots \dots (4)$$

where the symbol N denotes domestic security.

This shows that the domestic securities are issued solely by the private sector, banking sector, central bank and the foreign residents.

The fifth row shows

$$\Delta R_b + \Delta R_c + \Delta R_f = 0$$

$$\Delta R_f = -(\Delta R_b + \Delta R_c) \dots \dots \dots (5)$$

where R is the foreign money.

Here it is shown that only the banking sector and the central bank hold the foreign money which are issued by rest of the world. But this is rather a simplified assumption, as in practice other sectors may also hold foreign currencies. So, we have assumed here that the amount of foreign money held by a country is the sum total of money held by the banking sector and the central bank.

Finally, we come to the last relationship

$$\Delta F_p + \Delta F_b + \Delta F_c + \Delta F_f = 0$$

where 'F' denotes foreign securities.

$$\text{Or } -\Delta F_f = \Delta F_p + \Delta F_b + \Delta F_c \dots \dots \dots (6)$$

The above relationship shows that the foreign securities issued are generally held by the private sector, the banking sector and the central bank. Again, we have made a simplifying assumption here that the government sector does not hold any foreign security. Thus, we can obtain the total amount of foreign securities held by a country by adding the amount of security held by the banking sector and the central bank.

With this we find the basic relationship which may exist across different sectors.

Sector-specific relationships in an open economy

Now let us turn to each sector and estimate the sector-specific receipts and expenditures.

The first sector is the private sector which shows that,

$$(I - S) + \Delta H_p + \Delta D_p + \Delta N_p + \Delta F_p = 0$$

$$\text{or } (S - I) = \Delta H_p + \Delta D_p + \Delta N_p + \Delta F_p \dots\dots\dots(7)$$

This relationship shows that when there is excess saving made by the private sector, then it is generally held to accumulate monetary base (ΔH_p), deposits (ΔD_p), domestic securities (ΔN_p), or foreign securities (ΔF_p). Generally, we find accumulation of these stocks to increase with the increase in saving by the private sector.

We can also write the identity (7) as

$$(I - S) = -\Delta H_p - \Delta D_p - \Delta N_p - \Delta F_p \dots\dots\dots(7a)$$

This shows that any excess investment is actually financed by decumulation of monetary base, ($-\Delta H_p$), deposits ($-\Delta D_p$), domestic securities ($-\Delta N_p$) and foreign securities ($-\Delta F_p$).

The second column shows $G - T + \Delta N_g = 0$

$$\text{or } (G - T) = -\Delta N_g \dots\dots\dots(8)$$

This shows that the government budget deficit is financed by issuing securities by the government.

But here we have assumed that government does not use domestic monetary base or foreign securities to finance a budget deficit, otherwise the relationship would have been a different one.

The next relationship regarding the banking sector is shown below.

$$\Delta H_b + \Delta D_b + \Delta N_b + \Delta R_b + \Delta F_b = 0 \dots\dots\dots(9)$$

The relationship shows that any increase in the bank deposits which is a liability of the bank is actually balanced by flow of funds from domestic securities, foreign currency holding of the bank, foreign securities held by the bank and its holding of the monetary base issued by the central bank. All these are credit item and the bank will receive money at its exchange.

The fourth identity shows

$$\Delta H_c + \Delta N_c + \Delta R_c + \Delta F_c = 0 \dots\dots\dots(10)$$

This column shows the receipt and expenditure of the central bank. While the issuing of high-powered money is a liability of the central bank, its credit items are its acquisition of national and foreign securities (ΔN_c and ΔF_c) and foreign exchange (ΔR_c). Thus, any change in monetary base of the central bank depends upon its change in holding of domestic and foreign securities and foreign exchange.

Ultimately, the last column shows the overall balance in the economy. The identity of the last column is as follows :

$$(Exp - Imp) + (\Delta N_f + \Delta F_f) = -\Delta R_f \dots\dots\dots (11)$$

In the identity, $(Exp - Imp)$ shows the current account balance and $(\Delta N_f + \Delta F_f)$ shows the capital account balance shown by the change in the stock of domestic security owned by non-residents and the change in stock of foreign security owned by the residents. The current account and the capital account both are used to maintain the overall balances and any discrepancy is reflected by inflow of excess stock reserve or its outflow to maintain the overall balance.

5.3 The International Flows of Capital and Goods : Small versus Large Open Economy

By “Small” we mean that the economy is a small part of the world market and this cannot affect the world’s interest rate by changing its domestic policies. We have also considered the economy as an open economy and thus it has access to world’s financial market. This allows unhindered flow of capital to the economy. Thus the interest rate in the open economy equals the world’s real interest rate and any divergence from this rate will actually result in excessive incoming or outgoing of capital from the economy, thus putting the interest rate back at the world level.

In the world’s financial market, this interest rate r^* , is determined by the equilibrium level of world’s savings and investment. As the economy, we are considering, is small, it has negligible effect on a world’s savings and investment and hence cannot influence the world’s interest rate.

Here we assume that, output in the economy is fixed by the given amounts of factors of productions labour (L) and capital (K) and a fixed production function.

The consumption is a function of the disposable income $(Y - T)$, where Y is the income and T is the tax : $C = C(Y - T)$.

We also assume that the investment I, to be negatively related to interest rate.

Let us return to the basic national income identity derived from identity (1a). It is given by :

$$Y = C + I + G + NX \dots\dots\dots (12)$$

We manipulate this to obtain,

$$Y - C - G = I + NX \dots\dots\dots (12a)$$

$$[Y - C(Y - T) - G] = I + NX \dots\dots\dots (13)$$

We have assumed income to be fixed at Y, and consumption is a function of disposable income $(Y - T)$, and investment is a function of rate of interest r^* , we can write equation (13) from equation 12(a).

$$\text{Or } [Y - C(Y - T) - CG] - I(r) = N(X)$$

$$\text{or } S - I(r^*) = N(X) \dots\dots\dots (14)$$

where savings $S = Y - C(Y - T) - G$.

NX shows the difference between export and import and thus determines the current account deficit or surplus. The capital account is determined by the inflow and outflow of capital into the economy. Thus the difference between investment and savings determines the capital account. If investment is higher than savings then it would mean that, domestic savings is insufficient to finance domestic investment and any higher investment must be financed by borrowing from abroad and hence implies capital account surplus. Whereas an increase in domestic savings would imply capital account deficit, as capital must be flowing out of the economy.

From equations (13) and (14), we find that domestic savings $S = Y - C(Y - T) - G$ depends on government's fiscal policies (G and T). Government purchases or higher taxes affect national savings, whereas investment depends on the world's interest rate r^* . Thus from equation (14) we can also say that the capital account which is determined by the investment function, is also dependent on world's interest rate.

Now let us analyse how a change in fiscal policy may affect flow of capital and goods in the economy and hence influence its capital and current accounts.

Effects of changes in Fiscal Policy in the small open economy :

Suppose initially the country is in a position of balanced trade, having both the current account and the capital account at equilibrium. Now suppose the government increases its purchases, G. This will lead to a reduction in national savings, as savings is defined as $S = Y - C - G$. But the world interest rate will not change and the amount of investment will remain same in the economy. Thus, $I - S$ will rise leading to capital account surplus.

This is because with lowering of domestic savings the initial level of investment will have to be sustained by borrowing from abroad. Equation (14) also shows that current account must balance capital account and hence, a surplus in capital account must imply a deficit in the current account.

This may also be explained from the fact that a rise in domestic consumption of foreign goods, i.e. a rise in imports, must be financed by borrowing funds from abroad (inflow of capital) if domestic savings do not rise. Hence a current account deficit must be accompanied by a capital account surplus. On the other hand, a surplus in the current account would imply more consumption of domestic goods by foreigners and hence, must be financed by outflows of capital from the domestic economy leading to capital account deficit.

The same applies to a decrease in taxes, T. A tax cut increases disposable income, $(Y - T)$, and hence stimulates consumption and reduces savings. Thus, this results to inflow of capital into the economy. Thus, an expansionary fiscal policy that reduces savings will

lead to inflow of capital, creating a capital account surplus and inflow of goods creating current account deficit.

Now let us try to analyse the impact of a change in policies by a large economy upon the capital flows into the small economy.

Let us suppose that the world's interest rate is influenced by economic policies taken by the large country. Suppose that the large country undertakes an expansionary economic policy, i.e. say, the government purchase rises in that country. As the country is a large economy, therefore, increase in purchases by the government in that country reduces the world's savings and hence raises the world's interest rate. But an increase in world's interest rate will reduce investment in the small open economy. As domestic savings do not change, so with a fall in the domestic investment ($I - S$) must fall, implying a capital account deficit, and hence resulting in outflow of capital from the country. Again, as $NX = S - I$, therefore, reduction in investment will imply that NX must rise, (i.e., exports of the country must exceed imports) in order to equalize both sides. Thus an expansionary fiscal policy abroad, influencing the world's interest rate will result in both outflow of capital and goods from the domestic economy.

Shift in Investment Demand :

Let us suppose that in our small economy, the government undertakes a policy (like changing tax level etc.) which encourages investment activity and hence results in a higher level of investment. But as domestic savings is same, therefore, this higher investment is actually financed by borrowing from abroad. This will result in inflow of capital and hence there will be the capital account surplus. As $(I - S)$ rises, there must be deficit in current account. Therefore, an outward shift in the investment schedule causes a capital account surplus and a current account deficit.

Thus, we can conclude that in a small open economy, the flow of goods and services measured by the current account is inextricably connected to the flow of funds for capital accumulation measured by the capital account. Any economic policy that increases investment, puts capital account towards surplus and current account towards deficit, and policies increasing savings push the capital account towards deficit and current account towards surplus.

The above analysis is appropriate for a small open economy, but the analysis may change if we consider a large economy. By a large economy we mean that any change in the domestic economic policies would influence the world's rate of interest and hence can determine the flow of capital.

In a large economy, the flow of capital is the increasing function of the rate of interest. If a large country like USA starts borrowing excessively then it will pull the world interest rate upwards. Thus USA will have to pay higher interest rate if it increases borrowing. Thus unlike in a small open economy, where the flow of capital was independent of the interest rate, in a large economy capital inflow increases with the increase in the interest rate.

Since the country under consideration is large, the intersection of demand for and supply of loans determines the equilibrium real interest rate.

From the national income identity we obtain :

$$S = I + NX \quad (15)$$

or, $NX + (I - S) = 0$.

Now, $I - S$ is capital flow (CF) and hence,

$$NX + CF = 0$$

$$\text{i.e., } NX = -CF \quad (16)$$

Substituting (16) into (15) we get :

$$S = I - CF$$

$$S + CF = I. \quad (17)$$

The above equation states that the supply of loans must equal the demand for loans.

Now, $S = Y - C(Y - T) - G$ and CF is a function of rate of interest i.e. $CF(r)$. Then, we can write (17) as

$$Y - C(Y - T) - G + CF(r) = I(r)$$

$$S + CF(r) = I(r) \quad (18)$$

Investment is negatively related to the rate of interest, r , and therefore, the demand for loan schedule will be downward sloping. Higher interest rate induces capital inflow from abroad and hence, $S + CF(r)$ curve will be upward sloping. This is shown in figure 5.1. The intersection of the two curves determines the equilibrium interest rate, r^* .

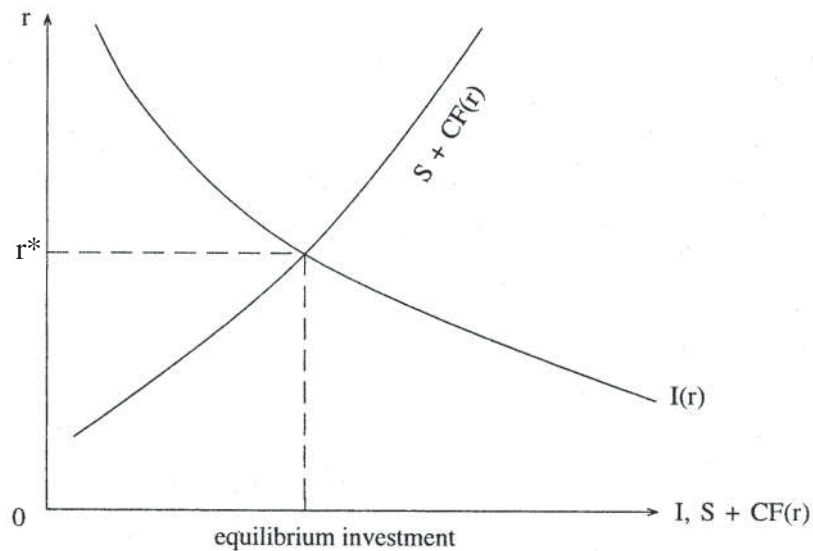


Figure 5.1

Now let us analyse how a change in economic policy will determine the capital flow in a large economy. Let us presume that the government undertakes an expansionary fiscal policy, like increase in government purchases. This will reduce national savings as $S = Y - C - G$ and thus, will reduce the supply of loan. Due to the largeness of the economy, interest rate will increase implying a leftward shift in the $S + CF(r)$ curve in figure 5.1. This will, in turn, reduce investment and increase capital inflows since current account and capital account are assumed to balance each other. Therefore, a surplus in capital account must be balanced by a deficit in the current account. Thus, NX must fall. Since NX is negatively associated with real interest rate, the real interest rate must rise. Then an expansionary fiscal policy in a large open economy will also increase capital inflow as was in the case of a small open economy. But here, in addition, a fiscal expansion will raise investment and hence crowd out domestic private investments.

5.4 Let Us Sum Up

In this unit we have analysed the national income accounting in the context of an open economy. Also, we have discussed the inter-relationship between different macro-economic variables in the context of an open economy. We have also explained the international flows of capital and goods in both small and large economy context.

Some problems and their solution :

1. Suppose for an economy $C = \text{Rs. } 2500$ crore, $I = \text{Rs. } 950$ crore, $G = \text{Rs. } 800$ crore. Imports : $\text{Rs. } 350$ crore and Exports : $\text{Rs. } 200$ crore. Find out GDP.

Solution : We know that $GDP = C + I + G + (X - M)$

Putting the given values we get the necessary GDP as

$$\begin{aligned} & 2500 + 950 + 800 + (200 - 350) \\ & = 4250 - 150 = 4100 \text{ crores.} \end{aligned}$$

2. From the following data find out personal income.

	(Rs. in crore)
(i) Income from domestic product accruing to private sector	224
(ii) Net current transfer from the rest of the world	3
(iii) Net current transfer from the Govt.	9
(iv) National debt interest	8
(v) Undistributed profit	1
(vi) Corporate tax	3

Solution : Personal income = (i) + (ii) + (iii) + (iv) – (v) – (vi)

$$= 224 + 3 + 9 + 8 - 1 - 3$$

= Rs. 240 crore.

3. On the basis of the following information, calculate personal disposable income :

(Rs. in crore)

(i) Private income	2000
(ii) Income accruing to corporations	500
(iii) Personal income tax	100
(iv) Dividend	50
(v) Miscellaneous receipts of govt. administrative department	50

Solution : Personal income = 2000 – 500 + 50 (dividend) = 1550

So, personal disposable income is 1550 – 100 – 50 = Rs. 1400.

5.6 Questions

- (i) Define GDP, GNP and NDP.
- (ii) Discuss the inter-relationship between different real and nominal variables in an open economy national income account framework.
- (iii) Discuss the international flows of capital and goods in the case of a small open economy.
- (iv) Discuss the international flows of capital and goods in the case of a large open economy.
- (v) Explain the effects of fiscal expansion in a small open economy. How are they different from the effects of fiscal expansion in a large open economy?
- (vi) Explain the implications of shift in investment demand. Contrast them with the implications of shift in investment demand in a large open economy.

5.6 References

Mankiw, N. Gregory, Macroeconomics, Worth Publishers, Fifth edition, 2003.

Dornbusch, Rudiger and Fischer, Stanley, Macroeconomics, Fourth Edition, McGraw-Hill International Edition, 1987.

Unit 6 □ Balance of Payments and Exchange Rates

Structure

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- 6.9 Exchange Rate Fluctuations and Interdependence**

6.9.1 Sterilized and Non-sterilized intervention

6.9.2 Interdependence

6.10 Capital Account Convertibility

6.11 Let Us Sum Up

6.12 Questions

6.13 References

6.0 Objectives

By the time you have studied this unit you should be able to :

- Explain balance of payments
- Explain exchange rates
- Explain adjustments under fixed exchange rates
- Explain adjustments under flexible exchange rates
- Explain purchasing power parity
- Explain interdependence between nations under flexible regime
- Explain capital account convertibility.

6.1 Introduction

In this unit we have discussed the concepts of balance of payments and exchange rate. We have explained nominal and real exchange rate and foreign exchange market. We then discussed how BoP deficit is adjusted under both fixed and flexible exchange rate regime. Then we have analysed the concepts of exchange rate overshooting, purchasing power parity and interdependence. Lastly, we discuss what is meant by capital account convertibility.

6.2 Balance of Payments

The balance of payments (BoP) accounts are an integral part of the national income accounts for an open economy. They record all transactions between ‘residents’ of the country concerned and those of other countries, where ‘residents’ are broadly interpreted as all individuals, businesses and governments and their agencies : international organisations are classified as ‘foreign’ residents for this purpose.

The balance of payments accounts serve another purpose. The balance of a country's foreign transactions and the accompanying issues of the exchange rate and reserves (whether of gold or of foreign currencies) has long been a focus of interest for policy-makers.

6.2.1 The balance of payments : book-keeping

The balance of payments is essentially an application of double-entry book-keeping, since it records both transactions and the money flows associated with those transactions. If we do this in a proper way debits and credits will always be equal, so that in an accounting sense the balance of payments will always be in balance. An accounting balance is, however, not synonymous with equilibrium.

It is important to keep in mind that a balance of payments account records flows between countries over a specified period of time (usually a year for the full accounts, but often less for some components of the accounts). Some items in the balance of payments are readily identified as flows, such as exports. Other items, however, are flows arising from changes in stocks, and the appropriate handling of these is often a source of confusion.

Traditionally, there are two basic elements in a balance of payments account : the current account and the capital account. Each of these usually subdivided, the former into visible and invisible trade and unrequited transfers, the latter into long-term and short-term private transactions and changes in official reserves. The essential difference between the two is that the capital account transactions necessarily involve domestic residents either acquiring or surrendering claims on foreign residents, whereas current account transactions do not. In practice, there is a third element, the 'balancing item' or 'errors and omissions' which reflects our inability to record all international transactions accurately.

6.2.2 The Current Account

The current account records imports and exports of goods and services and unilateral transfers. Balance of payments accounts usually differentiate between trade in goods and trade in services. The balance of exports and imports of the former is referred to as the balance of visible trade or as the balance of merchandise trade. It is often useful for economic purposes to distinguish between factor non-factor services. Trade in the latter, of which shipping, banking and insurance services, and payments by residents as tourists abroad are usually the most important, is in economic terms little different from trade in goods. That is, exports and imports of such services are flows of outputs whose values will be determined by the same variables that would affect the demand and supply for goods.

Factor services, which consist in the main of interest, profits and dividends, are, on the other hand, payments for inputs. Exports and imports of such services will depend in large from foreign residents.

Unilateral transfers, of ‘unrequited receipts’, are receipts which the residents of a country receive ‘for free’, without having to make any present or future payments in return. Receipts from abroad are entered as positive items, payments abroad as negative items.

The net value of the balances of visible trade and of invisible trade and of unilateral transfers defines the balance on current account. Table 6.1 shows the various components of the current accounts of the United State in 1989.

6.2.3 The Capital Accounts

The capital account records all international transactins that involve a resident of the country concerned changing either his assets with or his liabilities to a resident of another country. Transactions in the capital account reflect a change in a stock-either assets or liabilities.

It is often useful to make distinctions between various forms of capital account transactions. The basic distinctions are between private and official transactions, between portfolio and direct investment, and by the term of the investment (i.e. short or long term).

Table : 6.1

	<i>United States</i>
A : Merchandize exports	360.46
B : Merchandize imports	475.33
C : Visible trade balance ($A + B$)	-114.87
D : Exports of services	242.71
E : Imports of services	-223.14
F : Invisible trade balance ($D + E$)	19.57
G : Private unrequited transfers (net)	-1.33
H : Official unrequited transfers (net)	-13.43
I : Current account balance ($C + F + G - H$)	110.06

Direct investment is the act of purchasing an asset and at the same time acquiring control of it (other than the ability to re-sell it).

Portfolio investment, by contrast, is the acquisition of an asset that does not give the purchaser control. An obvious example is the purchase of shares in a foreign company or of bonds issued by a foreign government. Loans made to foreign firms or governments come into the same broad category. Such portfolio investment is often also distinguished by the period of the loan (short, medium or long are conventional distinctions, although in many cases only the short and long categories are used). The distinction between short-term and long-term investment is often confusing, but usually relates to the specification of the asset rather than to the length of time for which it is held.

The purchase of an asset in another country, whether it is direct or portfolio investment, would appear as a negative item in the capital account for the purchasing firm's country, and as a positive item in the capital account for the other country. That capital outflows appear as a negative item in a country's balance of payments, and capital inflows as positive items, often causes confusion. One way of avoiding this is to consider the direction in which the payment would go (if made directly). The purchase of a foreign asset would then involve the transfer of money to the foreign country, as would the purchase of an (imported) good, and so must appear as a negative item in the balance of payments of the purchaser's country (and as a positive item in the accounts of the seller's country).

The next value of the balances of direct and portfolio investment defines the balance on capital account. Table 6.2 shows the various components of the capital accounts of the United States in 1989. Official long-term transactions are subsumed in 'Other long-term capital'.

6.2.4 The remaining items in the balance of payments

The balance of payments accounts are completed by the entry of other minor items that can be identified but do not fall comfortably into one of the standard categories; errors and omissions, which reflect transactions that have not been recorded for various reasons and so cannot be entered under a standard heading, but which, we know, must appear since the full balance of payments account must sum to zero, and changes in official reserves and in official liabilities that are part of the reserves of other countries.

Table : 6.2

		<i>United States</i>
J	Direct investment (net)	40.50
K	Portfolio investment (net)	44.79
L	Other long-term capital (net)	2.64
M	Long-term capital balance (J + K + L)	87.93
N	Short-term capital balance (net)	16.32

Errors and omissions (or the balancing items) reflecting the difficulties involved in recording accurately, if at all, a wide variety of transactions that occur within a given period (usually 12 months). In some cases there is such a large number of transactions that a sample is taken rather than recording each transaction, with the inevitable errors that occur when samples are used. In other words, problems may arise when one or other of the parts of a transaction takes more than one year : for example, with a large export contract covering several years some payment may be received by all exporter before any deliveries are made, but the last payment will not be made until the contract has been completed. Dishonesty may also play a part, as when goods are smuggled, in which case the merchandize side of the transaction is unreported although payment will be made somehow and will be reflected somewhere in the accounts. Similarly, the desire to avoid taxes may lead to under-reporting of some items in order to reduce tax liabilities.

Finally, there are changes in the reserves of the country whose balance of payments we are considering, and changes in that part of the reserves of other countries that is held in the country concerned. Reserves are held in three forms : in foreign currency, usually but not always the US dollar, as gold, and as Special Drawing Rights (SDRs) borrowed from the IMF. Note that reserves do not have to be held within the country. Indeed most countries hold a proportion of their reserves in accounts with foreign central banks.

Table : 6.3

		<i>United States</i>
I	: Current account balance	–110.06
M	: Long-term capital balance	87.93
N	: Short-term capital balance	16.32
O	: Other recorded items	1.55
P	: Net errors and omissions	22.60
R	: Exceptional financing	—
S	: Liabilities constituting other authorities reserves	8.48
T	: Total change in reserves	–26.81

The changes in the country's reserves must, of course, reflect the net value of all the other recorded items in the balance of payments. These changes will, of course, be recorded accurately, and it is the discrepancy between the changes in reserves and the net value of the other recorded items that flows us to identify the errors and omissions.

Table 6.3 records the fall in balance of payments for the United States, in 1989. The balances on current account and on the long and short-term capital accounts are taken from Table 6.1 and 6.2.

6.2.5 Autonomous and Accommodating Items

Economists have often found it useful to distinguish between autonomous and accommodating items in the balance of payments. Transactions are said to be autonomous if their value is determined independently of the balance of payments. Accommodating items, on the other hand, are determined by the net consequences of the autonomous items. An alternative nomenclature is that items are 'above the line' (autonomous) or 'below the line' (accommodating). Obviously, the sum of the accommodating and autonomous items must be zero, since all entries in the balance of payments accounts must come under one of the two headings.

Whether the balance of payments is in surplus or deficit that depends on the balance of the autonomous items. The balance of payments is said to be in surplus if autonomous

receipts are greater than autonomous payments and in deficit if autonomous receipts are less than autonomous payments.

Unfortunately, the distinction between autonomous and accommodating items is not as straightforward as it may seem. Essentially the distinction lies in the motives underlying a transaction, which are almost impossible to determine. There is nevertheless a great temptation to assign the labels 'autonomous' and 'accommodating' to groups of items in the balance of payments. That is, to assume that the great majority of trade in goods and of long-term capital movements are autonomous and that most short-term capital movements are accommodating.

Whether that is a reasonable approximation to the truth may depend, in part, on the policy regime that is in operation. For example, what is an autonomous item under a system of fixed exchange rates and limited capital mobility may not be autonomous when exchange rates are floating and capital may move freely between countries.

In the current system, however, the exchange rate system is one of managed flexibility, with the official reserves used to smooth exchange rate fluctuations rather than to maintain the rate within a given band, and capital is much more mobile. A case can be made for regarding capital movements as autonomous under this system (determined by investment opportunities, savings rates, etc.). Movements in capital then determine the exchange rate, which, in turn, determines the current account balance, so that trade in goods and services is the accommodating item.

6.2.6 Deficit and surplus in the current account

As far as the notions of imbalances are concerned, the conventional focus is on three main imbalances that may occur within the balance of payments. The first is the current account and/or the trade account.

6.2.7 The Basic Balance

The basic balance is defined as the sum of the current account balance and the net balance on long-term capital, which were then seen as the most stable elements in the balance of payments, and so placed 'above the line'. A worsening of the basic balance (an increase in a deficit or a reduction in a surplus, or even a move from surplus to deficit) was seen as indicating a deterioration in the (relative) state of the economy.

An alternative approach is to consider whether the next monetary transfer that has been made by the monetary authorities is positive or negative-the so-called settlements

concept. If the net transfer is negative (i.e. there is an outflow) then the balance of payments is said to be in deficit, but if there is an inflow then it is in surplus. The basic premise is that the monetary authorities are the ultimate financiers of any deficit in the balance of payments (or the recipients of any surplus). These official settlements are thus seen as the accommodating item, all others being autonomous.

The monetary authorities may finance a deficit by depleting their reserves of foreign currencies, by borrowing from the IMF, or by borrowing from foreign monetary authorities. The latter source is of particular importance when other monetary authorities hold the domestic currency as part of their own reserves. A country whose currency is used as a reserve currency (such as the United States) may be able to run a deficit in its balance of payments without either depleting its own reserves or borrowing from the IMF since the foreign authorities may be prepared to purchase that currency and add it to their own reserves. The settlements approach is more relevant under a system of pegged exchange rates than when exchange rates are floating.

6.3 Exchange Rates

The exchange rate between two countries is defined as the price at which the currency of one country is exchanged for the other. Exchange rates can, broadly, be of two types : fixed exchange rates and flexible exchange rates. Though there are various intermediate versions which are not fully fixed or fully flexible.

6.3.1 Fixed Exchange Rates

In the fixed exchange rate system, the exchange rate is actually pegged to a particular fixed value by the government. A fixed exchange rate is defined as the exchange rate of a currency with other currencies within prescribed limits that are maintained by a government intervention through its central bank.

6.3.2 Demand for foreign exchange

Demand for foreign currency is a downward sloping curve based on the assumption that as the price of foreign exchange increases [i.e. when value of home currency falls with respect to foreign currency] its quantity demanded will decline. Thus, demand for foreign exchange is a function of exchange rate, e , and is denoted as $D(e)$.

6.3.3 Supply of foreign exchange

The supply curve of foreign exchange is an upward sloping curve, based on the assumption that if the price of foreign exchange increases, then quantity supplied of the foreign exchange [by the foreign country] must also increase.

The interaction of demand and supply schedule of foreign exchange determines equilibrium value of the exchange rate as shown in the figure below.

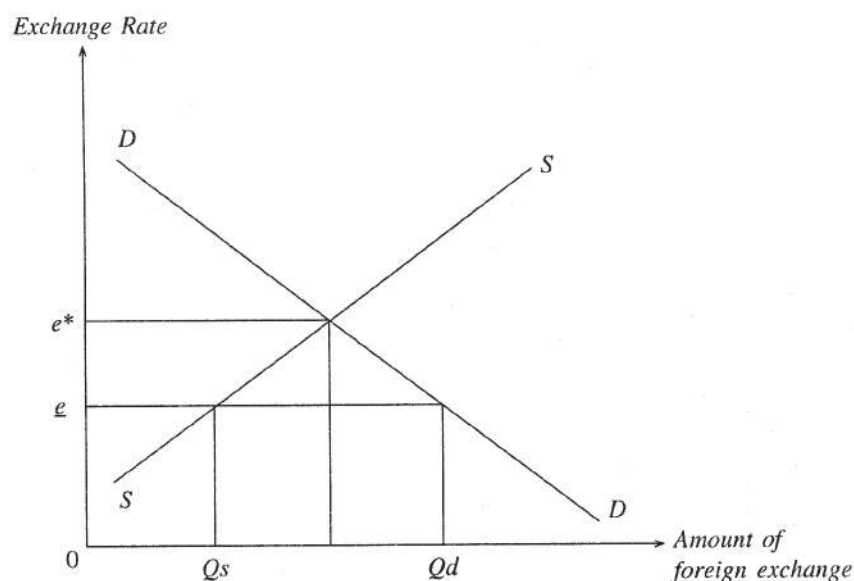


Figure 6.1

In figure (6.1), we have shown that the equilibrium exchange rate is at e^* . But now, suppose, there is a balance of payments deficit, so there will be an excess demand for foreign currency. Suppose the government has fixed the exchange rate at e . Then due to this excess demand for foreign currency, $[Q_d - Q_s]$, the exchange rate will tend to rise to e^* . But at this point the government must intervene to keep it fixed at e , by supplying the excess foreign exchange that is demanded. Conversely, when there is surplus in BoP, then, there is excess supply of foreign exchange and hence government must purchase this excess amount to keep the exchange rate fixed.

But if due to some unavoidable reasons, the government is forced to increase the pegged exchange rate, the price of foreign currency in terms of domestic currency increases and the domestic currency is set to be devalued. On the other hand, if price of foreign currency in terms of domestic current decreases, then the domestic currency is set to be

revalued. The term devaluation and revaluation is referred in the context of fixed exchange regime mainly when the monetary authority deliberately changes the exchange rate. In the context of flexible exchange rate regime they are known as depreciation and appreciation respectively.

6.3.4 Flexible Exchange Rate

Exchange rate is said to be flexible when it is determined in the foreign exchange market. Ideally there is no intervention by the monetary authority to set the exchange rate. Equilibrium exchanged rate is determined as indicated in figure 6.1.

6.4 Nominal and Real Exchange Rates

Economists are concerned with both nominal and real values of foreign currencies called the nominal and real exchange rates respectively.

6.4.1 Nominal exchange rate

The nominal exchange rate is the relative price of one currency with another currency, say Indian rupees versus US dollar. This is the conventional measure of exchange rate and measures the price of the foreign currency in terms of home currency. For example, the nominal exchange rate between Indian rupees and US dollar is Rs. 45/- per dollar. Here the exchange rate is expressed directly i.e. price of one unit of foreign currency in terms of domestic currency. This means that one-dollar can be purchased for Rs. 45. Generally, in daily life, the exchange rates which we find quoted in newspapers are nominal exchange rates. Nominal exchange rates can also be expressed indirectly i.e. price of one unit of home currency in terms of foreign currency.

6.4.2 Real Exchange Rate

The real exchange rate is the rate at which we can trade the goods of one country for the goods of another. That is, it shows the relative price of two goods. The following example will make it clear. Suppose, an Indian car costs Rs. 10,00,000/- and an American car cost \$ 40,000. Also suppose the nominal exchange rate between rupees and dollar is Rs. 50/- per US dollar or \$. 02 for Re. 1/-. Thus now if we compare the price in terms of dollar of the Indian car [\$20000] with the price of the American car [\$40,000], we find that we buy two Indian cars at the price of one American car.

Thus, Real Exchange rate

$$= \frac{\$0.02/\text{Rs} \times \text{Rs}10,00,000/\text{Indian car}}{\$40,000/\text{American car}}$$

$$= \frac{0.5 \text{ American car}}{\text{Indian car}}$$

That is, in terms of real exchange rate, one half of the American car is equal to price of one Indian car, or price of two Indian cars is equal to the price of an American car.

Generally, we can write :

$$\text{Real Exchange Rate} = \frac{\text{Nominal Exchange Rate} \times \text{Price of Domestic Goods}}{\text{Price of Foreign Goods}}$$

The rate at which we can exchange foreign and domestic goods depends on the price of the goods in the local currencies and on their exchange rates. Let us now consider a broader basket of goods. Let P^* be the price level in the foreign currency and P is the price level in home currency, and E is the nominal exchange rate, in this case the real exchange rate, is given as :

$$\text{Real exchange Rate (e)} = \frac{\text{Nominal Exchange Rate (E)}}{\text{Ratio of price levels (P/P*)}}$$

$$\text{Or, } e = E(P/P^*) \dots\dots\dots (1)$$

6.4.3 Determinants of nominal exchange rates

In this section, we will look into the impact of changes in relative price level on the exchange rates.

Rearranging equation [1], we can get,

$$E = e \times (P^*/P)$$

i.e. nominal exchange rate = real exchange rate \times ratio of foreign price level to domestic price level.

This equation shows that the nominal exchange rate depends on the real exchange rate and on the price levels in the two countries. Thus, if there is a rise in the domestic price, then it would lead to a fall in the nominal exchange rate. On the other hand, if the price level in the foreign currency rises, then, it would mean that the currency of that country can buy fewer amounts of goods. So the exchange rate will rise.

More generally we can express equation [2] by taking logarithm on both sides as

$$\log E = \log e + \log p^* - \log p$$

Taking the total differential of both sides we get :

$$dE/E = de/e + dP^*/P^* - dP/P \dots\dots\dots (3)$$

$$\text{i.e. } \hat{E} = \hat{e} + \hat{P}^* - \hat{P} \dots\dots\dots (4)$$

where ^ indicates the proportionate change.

Percentage change of price in home currency is the rate of inflation in the home currency and percentage change of price in foreign currency is the rate of inflation in the foreign currency. Thus, if Π^* is inflation in foreign currency and Π is the inflation in home, then,

$$\% \text{ Change in } E = \% \text{ change in } e + [\Pi^* - \Pi]$$

This shows that, if a foreign country have a higher rate of inflation relative to India, then our currency will buy an increasing amount of the foreign currency over time, i.e. the nominal exchange rate will rise, i.e. E will appreciate. Whereas, if a country has a lower inflation relative to India, it will mean that Indian rupees can buy a decreasing amount of foreign currency, i.e. E will depreciate.

Then from here we observe that if a country takes an expansionary monetary policy, when the economy is already near full employment of its resources, then it may lead to increase in the inflation level in that country, and which will, in turn, lead to depreciation of the home currency with respect to the foreign currency and if a contractionary monetary policy is taken, it will lead to the appreciation of the home currency. Contractionary monetary policy means that interest rate will rise as money supply falls. This will further attract foreign funds in the country, and hence will increase the demand for home currency, which will further pull exchange rates up i.e., the home currency will appreciate. Similarly, an expansionary monetary policy will reduce inflation rate, thus reducing demand for home currency and hence will depreciate home currency.

6.5 Adjustment Under Fixed Exchange Rates

In the previous section, we have defined fixed exchange rate regime. In this section, we will show how a BOP deficit or surplus could be adjusted under the fixed exchange rate system. Generally, there are few adjustment processes : one is change in economic policy and the second is through automatic adjustment mechanism.

Let us start our analysis by considering an open economy. The aggregate demand in the open economy will be a downward sloping curve, like that of in a closed economy, showing that a fall in the price level will induce higher spending and vice-versa. But in this case there is another additional reason for the curve to be downward sloping. In the closed economy, a rise in the price level with given nominal money supply, means lower real balance M/P . But money demand remaining same, it would mean a rise in interest rate, which will, in turn, lower investment demand and hence lower spending. Thus, with a rise in price level spending reduces in a closed economy. But in an open economy, an increase in price of goods reduces their competitiveness in the global market, making them more expensive than the foreign produced goods. Thus this reduces the demand for the goods. Therefore, in an open economy, the aggregate demand for goods is equal to aggregate spending by domestic resident plus net export. The aggregate demand curve is constructed on the assumptions that foreign prices, nominal money supply, fiscal policy and exchange rate are given. Any change in of these variables will shift the aggregate demand curve.

Similarly, the aggregate supply curve will be positively sloped showing output produced in a country will rise with a rise in the price level. This relationship can be explained from the labour market point of view. A rise in output means increased employment, and, therefore, increased wage costs and this increased wage cost will, in turn, raise aggregate price level. The interaction of the aggregate demand and the supply curve fixes the level of output at Y . In the open economy model, another additional factor must also be considered. This is the trade balance equilibrium schedule shown by $NX = 0$. It shows the different levels of output where the trade balance is at equilibrium, i.e., where exports equal imports. This schedule is also a downward sloping schedule, because any increase in income must be accompanied by a fall in price to restore trade balance. The reason is given below. Suppose there is an increase in income of the domestic currency, then it will lead to increase in imports. And this will create BoP deficit. To rectify this deficit, price of the domestic goods must fall, so that export of the country becomes cheaper relative to its import. Thus, to restore equilibrium price must fall. Any point on the right of the $NX = 0$ schedule, like point E in figure 6.2 will imply the country has trade deficit, because at this point either domestic prices are too high, reducing exports, or incomes are too high, increasing imports.

The point where all these three schedules intersect will signify both the full employment and trade balance equilibrium level of output. This is shown at point E', in figure 6.2 below.

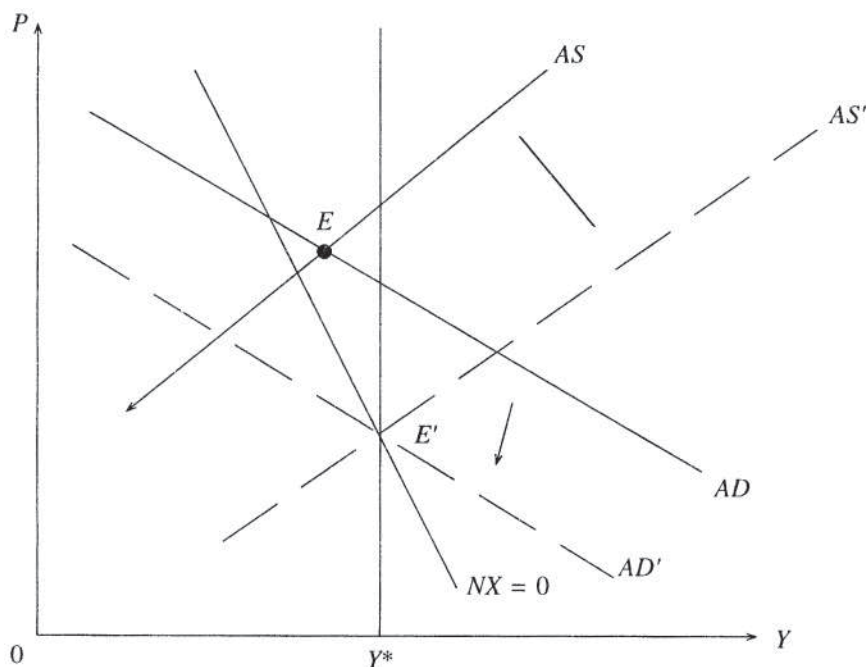


Figure 6.2

But suppose the economy, initially, is at a point E, which shows that there is trade deficit, as it is on the right of the $NX = 0$ curve. Also there is unemployment. In such a situation in order to move to an equilibrium situation, there are two options open to the government. One is the automatic adjustment process, in which the central bank has to intervene, and the other is by using different policies, like imposing tariff or devaluation of the currency.

6.5.1 Automatic Adjustment

In the automatic adjustment process, the central bank has to intervene, in order to remove the deficits. Let us assume that initially the country is at point E. At a point E then the country runs a BoP deficit and hence the demand for foreign exchange is larger than its supply in the economy. So, the central bank steps in and sells the required excess foreign exchange to maintain exchange rate fixed. But in doing so, it reduces the domestic high-powered money, and hence the money supply will fall. So, this will shift the aggregate demand schedule of the economy downwards and to the left.

Now let us consider the aggregate supply curve, where there is unemployment at point E. Hence it will lead to a decline in wages and cost. This will shift the aggregate supply schedule downwards. These shifts in both supply and the demand curves will continue until they move to the new equilibrium at E'. E' is the long run equilibrium point. At E', trade balance is in equilibrium, as there is no pressure on exchange rate. The demand schedule will not change further because there is no change in money supply. Aggregate supply curve will also stop shifting owing to constant wages and costs. Thus at E', the country has successfully adjusted to the initial BOP deficit. It has achieved trade balance equilibrium combined with full employment. This process of adjustment is also called the classical adjustment process.

6.5.2 Policies to Restore Adverse Balance Of Payments Situation

One of the drawbacks of automatic adjustment process is that it not only takes a long time to adjust but also requires a very long recession, so it may lead to increase in unemployment during adjustment.

So often, instead of using automatic adjustment process, different policies are used in order to adjust trade deficit. One such method is imposing tariff i.e. taxes on imports and thus imposition of tariffs will raise the price of imports and thus will reduce the demand for imported items in the economy. Thereby, it will correct the balance of payments situation. But with the emergence of international institution like the WTO, tariffs can no longer be used freely to adjust adverse BOP situation.

So, another policy which is often used to adjust the adverse BOP situation is to reduce aggregate demand. We know from national income identity that

$$Y = C + I + G + NX \dots\dots\dots (1)$$

where C = Consumption Expenditure

G = Government spending

I = Investment

NX = net export or trade surplus,

or NX = Y – (C + I + G).

Thus reducing domestic spending relative to income, Y, can reduce a trade deficit. This reduction in expenditure can be possible by using various restrictive monetary and fiscal policies.

A third method which may be used for adjustment is via devaluation.

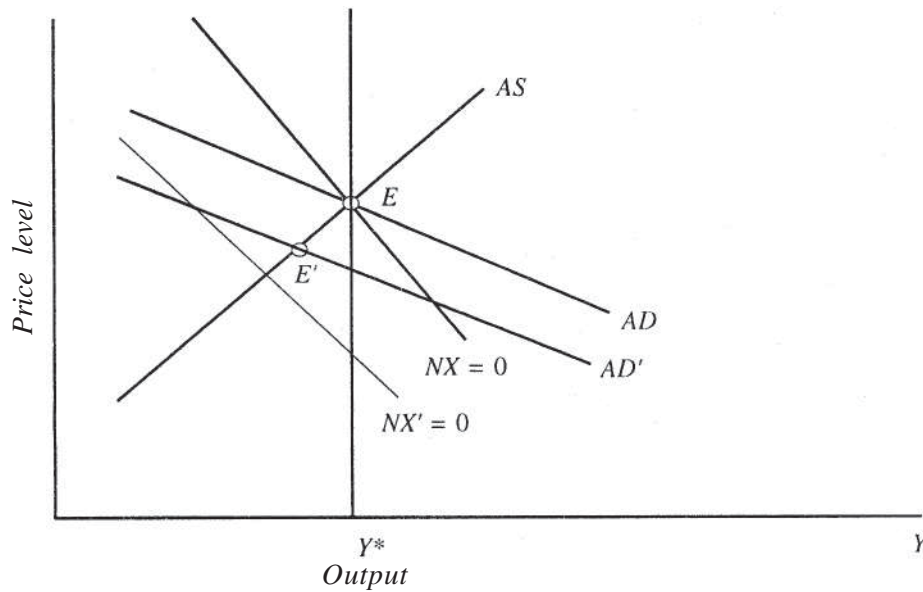


Figure 6.3

In figure 6.3, we have shown how such a policy actually works. In figure 6.3, it is shown that the intersection of the aggregate demand and the supply curve gives the initial equilibrium level of the country at point E , which is also the full employment equilibrium situation. There is also equilibrium in the trade balance at this point. Now suppose an external shock leads to reduction in export and hence reduces the export earnings. This shifts the trade balance curve $NX = 0$ to $NX' = 0$. At this point, due to lower demand for exports a fall in the aggregate demand will follow. The output level will fall. Thus aggregate demand will decrease, shifting the AD curve downwards to AD' , and, again, automatic adjustment procedure would start, which will shift the economy to a new equilibrium level. But instead, somehow if one could move the $NX = 0$ curve back to the full employment level of income, then also, the trade deficit will be eliminated. This can actually be done with devaluation of the domestic currency. By devaluation, we mean an increase in the domestic price of foreign exchange. Devaluation actually reduces the relative price of exports of the devaluing country and increases its relative price of its imported goods. So, a devaluation will increase the aggregate demand, thereby, increasing the export earnings, which will, in turn, restore the trade balance equilibrium at the full employment level of output.

6.5.3 Devaluation and Price Change

If domestic prices and foreign prices are constant, then devaluation will be successful in reducing the relative price of a country's goods. But if the price level increases with devaluation of its currency then, the beneficial effect of devaluation may not be obtained. This is because the price of the country's goods in the world market may not change at all and hence devaluation may no longer be useful as a tool for correcting trade deficit. Thus, what is needed is real devaluation. A country achieves a real devaluation when a devaluation reduces the price of the country's own goods relative to the price of foreign goods.

If the real exchange rate (e) is given by $E(P/P^*)$, then a real devaluation occurs when P/P^* rises, or when the exchange rate increases by more than the price level. In figure 6.4, we have described this in detail.

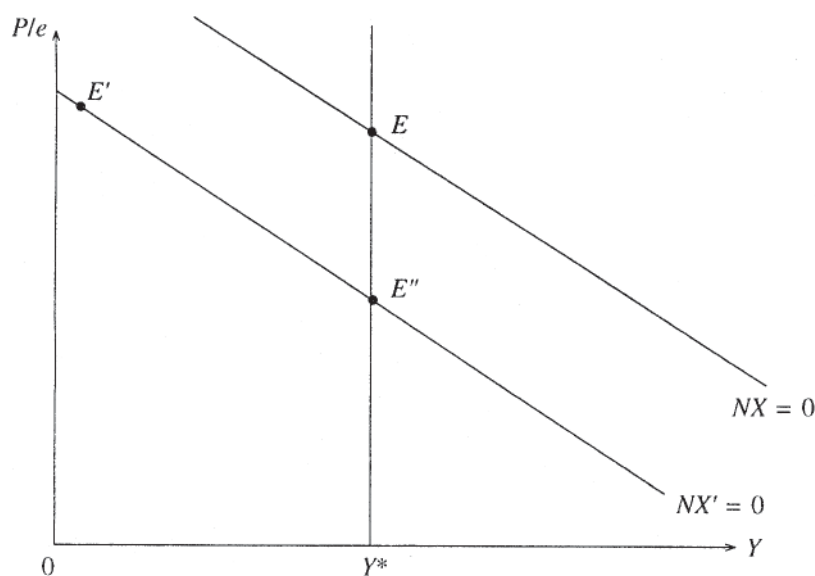


Figure 6.4

We have taken output in the horizontal axis and the exchange rate adjusted price i.e. international price of domestic output along the vertical axis. Now suppose there is a fall in the export earnings of the country. This shifts $NX = 0$ curve downwards to $NX' = 0$. So now the economy is at point E' . But this is not the full employment situation, so

somehow, the economy must shift to E'' to maintain the full employment equilibrium. So to reach that point, it has to devalue its exchange rate, i.e. E rises, and hence P/E falls, [i.e. relative price of domestic goods falls in foreign market.] But, if this rise in E is offset by an equal rise in price level P , then there will be no effective fall in the price level and hence competitiveness will not increase in the international market. Thus if aggregate demand does not increase output will not increase and hence it cannot move to the full employment level of output at Y^* . Thus devaluation as a policy measure will not work, if it is accompanied by inflation in the domestic market.

6.6 Flexible Exchange Rate, Money and Prices

In this section, we will discuss about the adjustment procedure under flexible exchange rate regime with respect to any change in the macro-economic policy.

In flexible exchange rate system, the demand for foreign currency and the supply of foreign currency jointly determine the equilibrium exchange rate. Any increase in demand for foreign currency reduces the demand for home currency and thereby price of home currency falls in comparison to foreign currency, i.e. exchange rate depreciates. Further, when supply of foreign currency exceeds the demand for foreign currency, the home country's exchange rate appreciates.

Now let us see how the output, price and exchange rate adjust to an initial policy change in such a system.

Our analysis is based on some initial assumptions. Firstly, we assume that there is perfect capital mobility, indicating that the world's interest rate and the home interest rate will always be equal. The line BB' shows the point where the trade balance will remain always at equilibrium. Whenever there is a monetary expansion leading to lowering of interest rate, capital will flow out of the country. This means that demand for home currency with respect to foreign currency falls and hence there is depreciation. But with depreciation, exports increase, leading to increase in income, which further increases demand for money, thus, pulling back the interest rate back to the world market rate. Thus, whenever interest rate of domestic countries changes from the world's interest rate, adjustments will take place, which will restore the interest rate back to initial level. Secondly, we assume that prices rise whenever output exceeds the full employment level.

Thus, we can summarize our assumptions accordingly, in the figure given below.

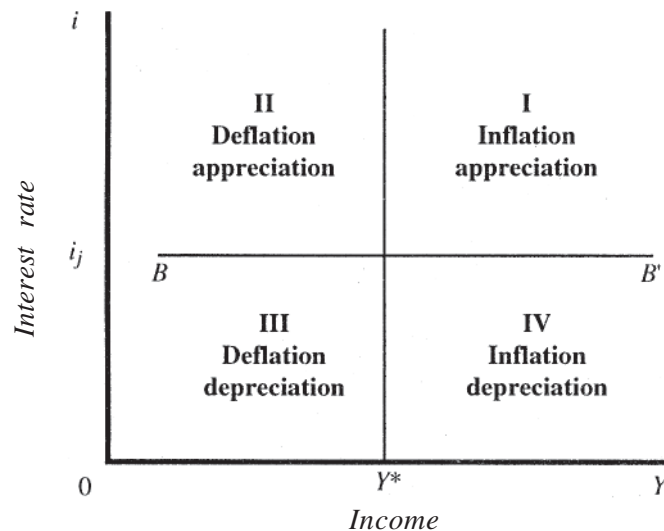


Figure 6.5

In the figure above, we have shown that above the line BB' , there is trade surplus, due to excess inflow of capital, and hence there is appreciation of exchange rate, and below BB' , there is trade deficit, so exchange rate of home currency will depreciate.

Similarly, at the output level above Y^* , [as Y^* is full employment level] price will be rising and below it, prices will fall.

Now let us see how a monetary expansion will work, when prices are flexible. The diagram below shows the adjustment procedure.

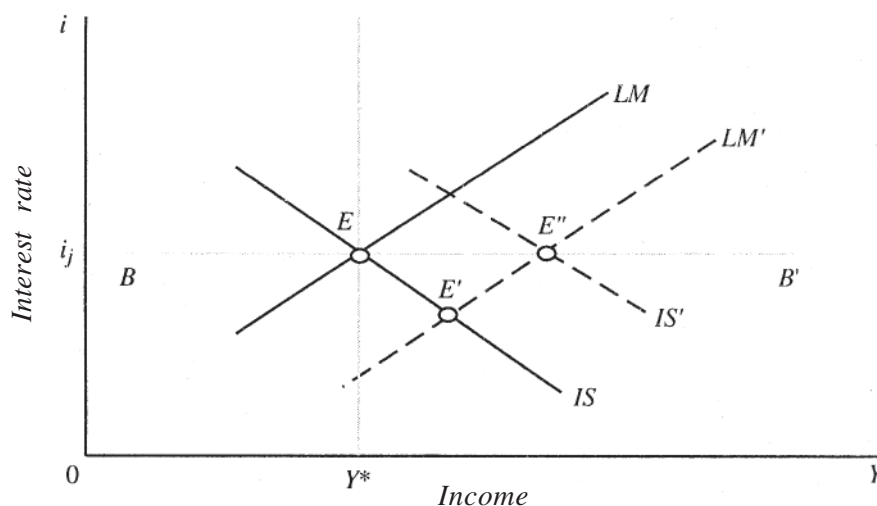


Figure 6.6

We will find that an output expansion under such a framework is temporary, and in the long run, it only leads to an exchange depreciation and to higher prices, with no change in relative competitiveness.

We start our analysis, by assuming that the economy was initially, at the level of output Y^* , as shown by the point E. At this point, there is money market, goods market and trade balance equilibrium. Now suppose there is an increase in the supply of money, but initially with price level fixed, this will increase the real money supply M/P , thereby, increasing output and reducing the interest rate below the world level. Thus, the new equilibrium will be formed at point E'. Now as interest rate falls, capital will move out of the country, thus creating a BOP deficit. So, exchange rate being flexible, it will immediately depreciate, raising the competitiveness of the domestic goods in the world market. This will increase income further, thereby increasing the demand for money, which will, in turn, increase the interest rate up. So the new equilibrium will occur in the world market at point E". But at E", the output is above full employment, so there will be inflation in the domestic market. This will again, reduce the real money supply M/P . With decline in real balances M/P , the LM curve starts shifting to the left. This increases the interest rate still further above the BB' line. With higher interest rate than the world market, again, there will be continuous capital inflow, resulting in appreciation of the home currency. This will decline the competitiveness of the domestic goods and thus reduces exports, increasing imports. Hence income will fall and along it there will be fall in the aggregate demand, which will reduce output level further. So the IS curve will, again, shift back from IS' to IS. So ultimately both the IS and LM schedules are back at point E, with no ultimate change in the output level.

So in the long run, we find that in the whole adjustment process, the relative price, and exchange rate rose (by the same proportion), leaving aggregate demand unchanged. Thus, in the long run, effect of an increase in the supply of money has no effect on output or employment level.

6.7 Exchange Rate Over Shooting

In the previous section, we have seen that the exchange rate and the prices do not adjust at the same rate. When there is a monetary expansion it pushes down interest rate and exchange rates adjust immediately, but prices adjust only gradually. Thus at first instance there is increase in the exchange rate. But, with this depreciation of the exchange rate, due to excess aggregate demand from the world market, output will increase above

the full employment level and so price will rise along with appreciation of the exchange rate [as M/P is falling, interest is rising, so fund coming in, leading to appreciation].

Over time, price rise will match the initial increase in money and the exchange rate will also match the higher level of money and prices. Thus, in the long run, real variables are unchanged. But initially we will find that the exchange rate will depreciate to a much greater extent, then the equilibrium level will require, thereafter returning to long run equilibrium again. This is called overshooting. Thus by overshooting means changes in monetary policy that produce large change in the exchange rate.

Exchange rate overshooting is quite common in the real world. Such over shooting often introduces an undesirable instability into the economy, demanding government intervention. The sharp dollar appreciation of 1980-85, strongly reinforced the call for such intervention.

6.8 Purchasing Power Parity

The purchasing power parity (PPP) was first stated by the Swedish economist Gustav Cassel in 1918. There are two versions for defining purchasing power parity : absolute version and relative version.

In its absolute version, purchasing power parity states that exchange-adjusted price levels, should be identical worldwide. That is, in other words, one unit of home currency should have the same purchasing power around the world.

According to the new version of the purchasing power theory, which is used more commonly, exchange rate between the home currency and any foreign currency will adjust accordingly to reflect changes in the price levels of the two countries. For example, if rate of inflation is 5% in the United States, and 1% in Japan, then in order to equalize the dollar price of goods in the two countries, the dollar value of Japanese Yen must rise by about 4%.

In the preceding analysis, the exchange rate rises precisely, by almost the right amount to offset the effect of domestic inflation on real exchange rate. That is, in response to increase in domestic prices, the exchange rate depreciated, so that the price of goods remained same in the world market.

That is, if the real exchange rate is $e = E(P^*/P)$, then with a change in P^* and P , e must also change in such a way that the real exchange rate must remain constant.

Though purchasing power parity holds in general, but two points must be mentioned in this regard.

Firstly, in the short run, any monetary expansion can effect exchange rate, so that it depreciates more than the price level. Thus, in the short run, we can see substantial deviation of exchange rates though purchasing power parity may hold in the long run. Secondly, we saw in our analysis, that an increase in exports will cause domestic currency to appreciate at unchanged domestic prices. This clarifies that over time, adjustment to real disturbances will affect equilibrium real exchange rate and in the long run exchange rates and prices may not necessarily move together.

6.9 Exchange Rate Fluctuations and Interdependence

One of the major causes of the break down of the Bretton Woods system was that frequent changes in exchange rates expectations generated huge capital inflows or outflows, which ultimately resulted in actual change in exchange rate in the line of the expectations, by the speculators. Such changes often hampered the level of output and employment within the economy leading to lower level of output and employment, thus destabilizing the economy. This drawback actually led to the emergence of the flexible rate system. In the flexible exchange rate regime, the government takes no action in the foreign exchange market. But in the real world, such kind of fully flexible exchange rate system is not common, except for some exceptional cases, like during 1981-82 in the United States. More often we find that governments do intervene in the foreign exchange market, via buying or selling foreign exchange in order to influence the exchange rates. Such kind of exchange rate system, in which government makes substantial intervention, is called dirty float or managed float regime. But the government does not commit itself to maintain certain fixed exchange rate.

There are mainly three reasons for government intervention in forex market. Amongst them, the main reason is to stabilize the economy from excessive capital inflows/outflows resulting from unstable adverse expectations. For example, let the expectation be that exchange rate will appreciate. Suppose further the domestic interest rate is higher than the world interest rate. Therefore, capital will flow in the country. But this excessive capital inflow means the demand for domestic currency will rise, leading to increase in its value compared to the foreign currency i.e. the domestic currency will appreciate. But this can be unfavourable to the country's international competitiveness, thereby reducing the aggregate demand for its product in the world market.

Thus in order to prevent the country from such a situation, the central bank may step in to prevent such appreciation by purchasing the excess foreign reserves.

Secondly, if the central bank wants to affect trade by removing the real exchange rate, it must intervene.

Thirdly, the central banks in order to reduce inflationary pressure in the domestic market, deliberately prevent depreciation of the exchange rate, thereby preventing import prices to rise which help in containing inflation. But critics argue that it is not always possible to exactly predict the fluctuations in the exchange rate. Central bank's attempt to smooth out such fluctuations may often be, thus, misleading.

6.9.1 Sterilized Versus Non-Sterilized Intervention

To judge the effectiveness of intervention, we must distinguish between sterilized and non-sterilized intervention. Sterilized intervention means an intervention by the government in the forex market does not change the money supply within the economy. For example, when the central bank, in order to prevent appreciation, gets involved in purchasing foreign exchange, then it increases the domestic money supply within the economy, which may, in turn, affect the price level. But simultaneously if the government in order to prevent increase in money supply, starts selling government securities, then the excess money supply which resulted due to purchase of foreign exchange will be absorbed. This kind of intervention is actually called sterilized intervention. But if the government does not take any action after purchasing the excess foreign reserves, then the money supply would have increased in the economy. This kind of intervention, which may lead to change in money stock [or other macro economic variable] due to its effect, is known as non-sterilized intervention. Non-sterilized interventions generally affect exchange rates, because it changes the money supply. But effectiveness of government interventions is not always guaranteed. It depends upon the speculation about future course of policies. The following examples will clear this point. The US dollar was appreciating at a large scale between 1980 and 1985. This was a major concern of the policy makers. The policy makers thought that the market expectation has pushed the dollar to such height and speculative prices are responsible for keeping it up. In September 1985, the finance ministers of the Group of Five (US, Japan, Germany, France and UK) announced their view that dollar was too high and thus their central banks want to sell dollars. This announcement by the Group of Five to take subsequent action induced a widespread speculation that dollar was going to depreciate. Thus, eventually the dollar responded quickly to such reverse speculation and hence the exchange rate was brought down i.e. dollar depreciated.

In this example we can, clearly, observe how speculation can work even if there is no change in actual policy.

Thus, the effectiveness of a government intervention also depends on the fact that how successful the effect has been to drive speculations in the right direction. Otherwise, no government intervention can be effective.

6.9.2 Interdependence

In this part we will discuss about one of the drawbacks of the flexible exchange rate system. Interdependence or spill over effect is quite common with flexible exchange rates.

By interdependence we mean policies taken within a country not only affect the variables within the domestic territory, but may also affect the macro economic variables of countries which are competitors of the home country.

The following example will make it clear. Suppose the United States tightens its monetary policy, increasing the interest rate within the country, due to rise in money demand. This will, in turn, attract capital and will thus result in appreciation of dollars. But appreciation of dollar will imply depreciation of other currencies. Now this appreciation in dollars will make US goods uncompetitive in foreign market, thereby reducing its demand. Thus output and employment will fall within the country. But other currencies [of the competitors] depreciate with respect to US dollar, so their goods will be cheaper in the foreign market and so demand for their goods will expand. This leads to expansion of output and employment within the competitor's country.

But apart from this effect, there can be another spill over effect in terms of price. When US currency appreciates, it makes their import cheaper thereby reducing inflation in the US. But conversely, inflation in the competitor countries rises as their currency depreciates.

In the same way, any fiscal expansion taken by the US will cause dollar appreciation [as expansionary fiscal policy increases interest rate, so inflow of foreign fund will cause exchange rate to appreciate], which will also, in turn, affect employment and inflation abroad, in the same way, which we have just discussed.

So policy makers of the US trading partners will have to decide, whether to accept employment and inflation or to take necessary steps to prevent inflation. One possible measure to prevent inflation is to take contractionary monetary policies. Thus, a contractionary monetary policy in the US may also result in contractionary monetary policies in its trading

partner's economy. This was substantially what happened in the worldwide recession of 1981-82.

Thus this kind of interdependence under the flexible exchange rate regime has suggested that policy coordination between different countries should take place, so that managing their macro economic problems becomes easier. But, although the leaders of the major industrial countries have repeatedly recognized their interdependence and agreed to work towards more coordinated policies, there have been no major institutional changes so far to ensure such coordination.

6.10 Capital Account Convertibility and Its Effects on Macro Economy and Trade

Capital account convertibility is synonymous with capital account liberalization. It implies relaxing of all restrictions or controls on capital inflows and outflows in an economy. Capital controls were exercised by many countries in the past to avoid adverse balance of payments situation. In fixed exchange rate regime which lasted till the collapse of the Bretton Woods system in the early 1970s most of the countries restricted free flow of capital. In particular, stringent restrictions used to be there on capital outflows so as to avoid adverse effect on balance of payments and thereby, on exchange rate. Capital account convertibility aims at lifting of such restrictions on international capital flows to and from domestic economy.

Since the inception of liberalization of our economy in 1991 one of the major debates that has emerged has been in regards to capital account convertibility (CAC). Capital account convertibility refers to removal of controls on capital movements or opening up in capital account of the balance of payments in order to ensure capital mobility.

In India, under the chairmanship of the former Deputy Governor of the Reserve Bank S. S. Tarapore a committee was appointed by the Reserve Bank of India, on February 28, 1997, to look after the possibilities for introduction of capital account convertibility.

In order to attain full capital account convertibility the various impediments that prevent the free mobility of capital must be removed. All forms of stringent capital control like exchange and quantity restrictions, dual or multiple exchange rate arrangements and taxes on external transactions must be removed to ensure its free mobility.

It has been found that imposition of tighter and more extensive controls often creates serious distortions in the economy. For example, such controls can inhibit certain external

transactions which may have been profitable for the economy, limit access to international financial markets preventing the opportunity to borrow from the cheapest market and also restrict competition in the domestic financial markets thus reducing their efficiency. Further, maintaining a tight control over the flow of capital is also quite costly in regard to enforcing controls, monitoring violations and prosecuting violators. Apart from these, if the capital account controls are removed then it would also improve the global intermediation of resources, thus ensuring that the domestic savings are utilized in the most productive way. It would also allow the domestic residents to hold an internationally diversified portfolio of assets making their income less vulnerable to domestic shocks.

The above advantages may influence an economy to liberalize its capital account at any time. But before the imposition of full convertibility, certain reform policies must be undertaken in order to prevent the economy from the vulnerabilities of free capital flows. These policies include elimination of domestic and international interest rate differentials, fiscal reforms, proper regulation and supervision of the domestic financial markets by increasing its transparency, removal of barriers to wage and price flexibility.

Effects of capital account convertibility

Here we will analyse the effects of removal of CAC on the various macro economic variables. Firstly, removal of restrictions in the capital accounts integrates the domestic markets with the international markets and hence encourages introduction of the new financial instruments in the domestic financial market. This kind of innovations, on the one hand, will increase competition and hence, would increase the efficiency in the financial market. But, on the other hand, they would introduce complex risk elements, which would eventually generate problems in fixing the correct price for these financial instruments. The experience of the developed countries suggests that at times of financial innovations the market for new product eventually grows rapidly and hence initially appropriate pricing of the instruments is not possible. This is simply because there are some costs in acquiring the knowledge and experience for efficient pricing, (learning cost may appear in the form of under priced transactions which may generate short term losses). Thus the rapid changes in the financial markets resulting from the opening up of capital account may result in accumulation of some undesired risks in the process of learning to price the new products more efficiently. Therefore, to take care of this risk the domestic financial institutions will have to be supervised and regulated properly so that they can sufficiently cope with the risk associated with liberalization of the capital accounts.

Secondly, another effect which may result from CAC is the harmonization of the taxes within the country. If tax differentials exist then it may generate arbitrage opportunities.

Finally, CAC may lead to high asset price variability due to international fluctuations, and hence may produce an adverse effect on employment, output and wealth.

Effects of CAC on Trade

Implementation of CAC means removal of all kinds of restrictions from the capital accounts. If under this scenario, the domestic interest rate after being adjusted for depreciation, is found to be more than the interest rates prevailing in the international financial market, then this will result in a spontaneous capital inflow in the economy. Such huge amount of capital inflows will cause appreciation of the exchange rates. This appreciation of the exchange rate, in turn, will make our goods costly in the world market and hence make our exports uncompetitive. This will, eventually, reduce profits in the tradable sector and hence the productive resources will be transferred to the import competing non-tradable sectors. For example, Korea in 1960's and Chile in 1980's both experienced significant exchange rate appreciation of their currencies after liberalizing their capital account. This, in turn, adversely affected the performance of their export sector.

If capital flows are volatile then it may lead to fluctuation in exchange rate. But if exchange rate fluctuates it may generate intersectoral transfer of resources. These transfers involve an intersectoral adjustment cost, which the economy has to bear. For example, if a sudden excessive inflow of capital leads to appreciation of the exchange rate then it may result in switching of the productive investments from the export sector to the non-tradable import competing sector. If the market is volatile then after a little gap a depreciation of the exchange rate may result in switching the productive investments back to the export sector.

Thus, if the international market is volatile then the society will have to bear a cost of switching the productive resources from one sector to another. Thus, to avoid such costly movement of resources within the domestic economy financial reform policies must be implemented before the CAC is implemented.

6.11 Let Us Sum up

In this unit, we have learnt about balance of payments and exchange rates. Balance of payments is a record of transactions of a country with the rest of the world. In

accounting sense it is a double entry book keeping system and does always balance. By BOP surplus/deficit it is meant the gap between the country's receipts and payments.

Exchange rate is the price of foreign currency in terms of domestic currency. Under fixed exchange rate regime, the monetary authority fixes the exchange rate and intervenes in the forex market to keep it at the fixed level. Under flexible exchange rate regime exchange rate is market determined.

Nominal exchange rate is the nominal value of a currency in terms of another currency. Real exchange rate refers to the goods one unit of domestic currency can buy vis-a-vis the foreign currency. Nominal exchange rate depends on real exchange rate, foreign and domestic price level. Under fixed exchange rate regime the government may allow automatic adjustment mechanism to take care of BOP deficits. Or it can use policy induced measures. Under flexible exchange rate regime adjustment mechanism may have some impact on real variables but in the long run, no impact will be there, exchange rate may overshoot in the short run when adjustment sets in to cure BOP deficits under the flexible regime.

Purchasing power parity (PPP) means that the exchange rate adjusts to the ratio of domestic price level P , and the world price level, world P^* . This is the absolute version of PPP. The relative version states that the exchange rate fluctuation is equal to the rate of inflation between home and foreign country.

To take care of BOP deficits, if government intervenes then it affects the money supply of the country. To take measures against that government may get involved in open market operations, which is known as sterilized intervention.

The exchange rate fluctuation in one country, under flexible exchange rate regime, affects macro variables of other countries. This warrants policy coordination among the countries.

By capital account convertibility we mean the removal of all controls on capital flows to and from a country. There are certain costs and benefits of such convertibility.

6.12 Questions

- (i) What is balance of payments? Explain what you mean by BOP deficit/surplus.
- (ii) How government intervenes under the fixed regime in the forex market?

- (iii) Describe the adjustment mechanism under the fixed exchange rate regime.
- (iv) Describe the adjustment mechanism under flexible exchange rate regime.
- (v) What do you mean by exchange rate overshooting?
- (vi) Explain the concept of purchasing power parity.
- (vii) Why should there be policy coordination among nations under flexible exchange rate regime?
- (viii) What is the capital account convertibility? What are its effects?

6.13 References

Sodersten and Reed, Geoffrey, International Economics, Third Edition, Macmillan, 1994.

Dornbusch, Rudiger, and Fischer, Stanley, Macroeconomics, Fourth Edition, Mc-Graw Hill International Editions.

Levi, Maurice D., International Finance. McGraw-Hill International Editions. Third Edition; 1996.

Unit 7 □ Foreign Exchange and Risk Management

Structure

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7.0 Objectives

By the time you have studied this unit, you should be able to :

- Explain the function of a forex market.
- Explain the derivative market—markets for options, future and swaps.
- Explain the exchange rate management in the period of liberalization in India.
- Explain different exchange rate exposures and how to manage them.

7.1 Introduction

The scenario in international finance has changed dramatically since 1970 after the fall of the Bretton Woods System. With the emergence of the flexible exchange rate regime, the size and volume of the transactions in the forex market changed multiplicatively and handling of foreign exchange has become much more complex. In this unit, we will first briefly discuss the forex markets : the spot and the forward market and the operation procedures in those markets. Then we will discuss about the derivative market along with the various financial derivatives i.e., options, future and swaps in the context of international finance.

Thereafter, we will discuss about the foreign exchange exposures and associated risks and various tools which can be utilized to manage those exposures.

Apart from this, we will also discuss the exchange rate management system in India and its various modifications. The major focus of this unit is to describe the international financial markets, particularly the concepts associated with forex management.

7.2 Foreign Exchange Operations

The volume of international transactions has grown enormously all over the world since the end of the World War-II. In US, exports of goods and services now account for about 10% of its GNP or over \$500 billion annually. Further investigation shows that transactions involving hundreds of billions of dollars occur between the United States and other nations. But different countries in the world have different currencies and they all would require receipts denominated in their own currencies. This international trade of such huge amount would not be possible without the ability to buy and sell foreign currencies. Different categories of people involved in cross border activities like importers, tourists and investors require conversion of foreign currencies to their own currencies and vice versa.

In order to facilitate international trade and investment, activities throughout the globe, exchange of currencies takes place continuously at a very fast pace, in the foreign exchange markets.

Let us now look at the mechanisms by which the forex market performs. The main function of the foreign exchange market is to permit transfers of purchasing power denominated in one currency to another, that is, to trade one currency for another. Apart from this, there are various other functions performed by the foreign exchange market, which are indicated below.

7.2.1 Functions of the Forex Market

1) Transfer of purchasing power among currencies

Suppose a trade agreement is made between a Japanese manufacturer and a Brazilian importer. The agreement is such that the entire transaction will take place in terms of dollar. So, the Brazilian importer will have to transfer purchasing power to dollar which will be recovered by the Japanese exporter, who, in turn, will have to convert it to Yen. For all these currency transactions to take place the foreign exchange market is required. There are two types of forex market : the spot market and the forward market.

In the spot market, currencies are traded for immediate delivery, or at the most within two business days all transactions are being concluded. However, in the forward market, contracts are made to buy or sell currencies for future delivery.

2) Provisions for Credit

Forex markets may also be used to make arrangement of credit to facilitate international trade. Forex dealers issue “Letter of Credits” (LoC) for such purpose. Letter of Credit (LoC) is nothing but a guarantee, which is provided to the manufacturers’ banks by the importers’ bank about the stipulated payment in advance. This then helps the manufacturers to start production without any anxiety about the payment.

3) Minimizing foreign exchange Risks

Another important function of the forex market is to minimize risk. Foreign exchange market fluctuates quite unpredictably due to uneven fluctuations of the exchange rates. This kind of fluctuations may often lead to transaction loss and give rise to exchange risk.

For example, suppose an American investor invests \$1000 in India at an exchange rate of Rs. 50/- per dollar. That is, he invests Rs. 50000/- in Indian currency. Now suppose he expects an overall return of Rs. 60000/- after three months. Therefore, at the current exchange rate, he is expecting \$1200 after three months. But suppose the exchange rate of rupees to dollar depreciates and becomes Rs. 60/- per dollar after three months. Therefore, instead of receiving \$1200, now the American investor will receive \$1000 [as Rs. 60 = 1\$, so Rs. 60000/- = \$1000]. So, he will actually incur a loss of \$200 in terms of American currency. This is known as exchange risk. So to avoid such risk, resulting from fluctuations in exchange rates, investors and traders often enter into contracts, with forex dealers at a certain cost like the forward market contracts or use various financial derivatives to hedge the risk emerging from exchange rate fluctuations.

There are different kinds of players in the forex market. We discuss about them below :

7.2.2 Market participants

Generally, there are four categories of market participants : the dealers, the individuals, arbitrageurs and the speculators, the central banks and other aggressive market players.

(a) Dealers :

Generally, large banks and non-banking financial institutions act as forex dealers. Most of the transactions in a forex market is done via forex dealers. If an individual wants to buy dollar then, bank will be responsible for selling dollars to him. Simultaneously, if an individual wants to sell dollar banks will be buying dollars from him. Thus in an operational sense, dealers ensure a complete market, acting both as sellers and buyers of forex reserves.

(b) Individual Traders :

Second category of participants in the forex market is individual traders, multinational corporations and big investors. They take part in the forex market primarily to convert one currency to another.

(c) Arbitrageurs and Speculators :

Third category of participants is the arbitrageurs and speculators. Arbitrageurs are persons, who buy foreign currency cheaply and sell at high price. In the currencies market they buy foreign currencies at a cheap rate in one market and sell them in another market where the price of the currency is high. This kind of opportunities may emerge due to minute difference in the exchange rates between countries.

For example, suppose a person can buy pound sterling at \$1.9809 in New York, and Deutschmark at \$0.6251 in Germany, and at the same time London banks are offering pound sterling at DM 3.1650.

Looking at the above situation an arbitrageur will sell dollar for Deutschmark in Germany, collect Deutschmarks to acquire pounds sterling in London and sell them in New York.

Specifically, the trader could acquire DM 15997444.04 for \$1000000 in Frankfurt, sell their Deutschmarks for £505,448.35 in London and resell the pounds in New York for \$1,001,242.64. Thus within a few minutes, he will gain \$1242.64 which is totally a riskless profit, as it does not depend upon fluctuations in exchange rate. But apart from the

arbitrageurs there is another category of individuals who try to make profit depending upon the fluctuations in exchange rates. We may call such category of individuals as speculators. They may make profit if their expectation is fulfilled, but make loss otherwise.

(d) Central bank and aggressive market players :

Central banks buy or sell huge amount of foreign exchange, so that they can influence the exchange rate. In the fixed exchange rate regime, the central bank intervene in the forex market to keep exchange rate fixed. In the flexible rate regime, they may intervene to prevent exchange rate from either depreciation or appreciation.

7.2.3 Size of the Forex Market

The foreign exchange market is the largest financial market in the world. According to an estimate in 1990, the average foreign exchange trading volume is over \$650 billion daily or a \$160 trillion a year. The size of the transaction daily in a forex market is such that volume equals two months trading in the US stock market. The figure below shows the average daily foreign trading in the three leading industrialized countries.

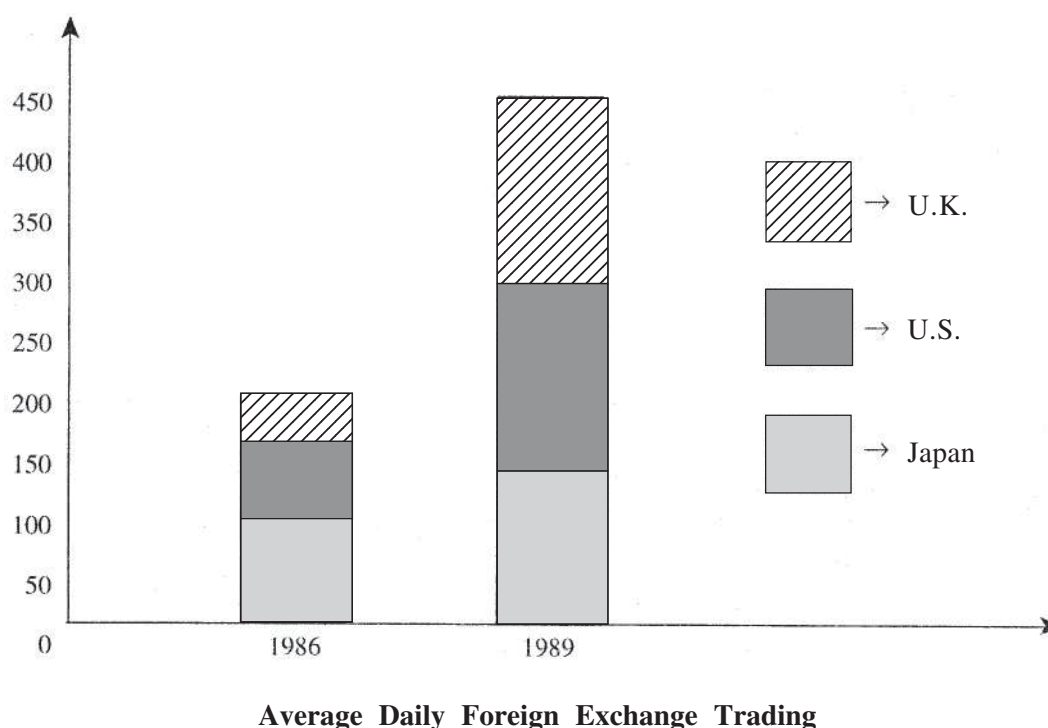


Figure 7.1

7.2.4 The Spot Exchange Market

The exchange rate trading occurs mainly in two kinds of market : the spot foreign exchange market and the forward market. In this section, we will be discussing how a spot market functions and about various quotes used in this market.

Huge amount of inter bank trades and large quantities of daily exchange of currencies occurs via the spot market. In the spot market, daily transactions occur via the spot exchange rate. The spot exchange rate is expressed as the number of units of one currency per unit of another currency. Actually both currencies are kept in the form of bank deposits, which are eventually transferred from sellers to buyers' accounts, when instructions to exchange currencies are received (generally taking the form of electronic message or bank draft). We find different kind of quotes via which the transaction takes place in the spot market. An exchange rate quotation is the price of a currency stated in terms of another. When currencies are expressed in dollars, then we can classify a quote as (a) European or (b) American quote. An American quote is the number of dollars expressed per unit of other currency, while a Europeans quote is the number of units of any other currency expressed per dollar. For example Rs. 5 per \$1 is a European quote, while \$.022/ Re. 1 is an American quote. In most of the countries exchange rates are quoted in European quotes.

(a) Direct Quote

When an exchange rate is expressed in terms of number of units of the domestic currency per unit of foreign currency, then we call it a direct quote.

For example Rs/\$ expresses that one unit of dollar (foreign currency) costs Rs. 45/- (domestic currency).

(b) Indirect Quotes

When exchange rate is expressed in terms of number of units of foreign currency for a fixed number of units of domestic currency, then we call it indirect quote. For example, \$2.22/Rs. 100/- indicates that dollar can be bought at the rate of \$2.22 for 100 units of domestic currency [or \$.022 can be bought for one unit of domestic currency, if the direct quote is Rs. 45/-/\$1]. Thus we find indirect quotes are reverse of direct quotes. In fact, direct quote from the point of view of one country is actually indirect quote from the point of view of another country. In India, indirect method of quoting exchange rates was used before August 2, 1993, but since then direct quote is being used.

In other countries, the concept of American and European quotes is more popular in comparison to direct and indirect quotes.

(c) Bid and Ask Rates

Almost all major newspapers print a daily list of exchange rates. But we will find that quotes, given in these newspapers are always given in pairs, because a dealer usually does not know whether a prospective customer is in the market to buy or sell a foreign currency. Suppose in a newspaper, the pound sterling is quoted at \$1.7019/36. This quote means that banks are willing to buy pounds at the rate of \$1.7019 and sell them at \$1.7036. In practice, dealers do not quote the full rate, instead they quote only the last two digits of the decimal. Thus sterling would be quoted at 19—36 in the above example. The rate, at which domestic banks buy foreign currency is known as bid rate and the rate at which banks sell foreign currency is called ask rate. Bid rates are always lower than ask rates so that dealers can make profit from the difference, which is called ask-bid spread.

Transaction Cost

The bid-ask spread i.e. the difference between bid and ask rates for a currency is usually stated as the percentage cost of transacting in a foreign exchange market. This spread can be computed as follows :

$$\text{Percent spread} = \frac{\text{Ask price} - \text{Bid price}}{\text{Ask price}} \times 100$$

For example, with pound sterling “quoted as \$1.7019 – 36, the percentage spread equals 1%.

$$\text{Percent spread} = 1.7036 - 1.7019 = 0.1\%.$$

(d) Inter bank quote and Merchant quote

Merchant quote is the quote given by a bank to its retail customers. On the other hand, a quote given by a bank to another is called an inter-bank quote.

(e) Inverse Quotes

For every quote (A/B) between two currencies, there exists an inverse quote (B/A), where currency A is being bought or sold with its price expressed in terms of currency B. An example will make this clear. For a rupees dollar there must exist a dollar rupee quote. In the following example, we will show how an inverse quote can be calculated from a simple quote.

Let the DM/\$ quote in Frankfurt be DM/\$: 1.6663/1.6668.

This in Frankfurt, 1.6663 is the bid rate and 1.6668 is the ask rate. So, the German bank is ready to buy dollars in Frankfurt [and sell Deutsche mark] at the rate \$1.6663. But this rate will be the rate at \$/DM quote in US. Because price of buying dollars must

be same everywhere, otherwise arbitrageurs may take advantage to make profit. So, as dollar is the home currency in US, i.e. in \$/DM quote, so bank buying dollar or selling foreign currency (DM), will use the ask rate in the USA.

Therefore, in \$/DM terms, the ask rate will be reciprocal of 1.6663 (bid rate in Frankfurt) i.e. $1/1.6663 = \$ 0.6001/\text{DM}$. Similarly, the bid rate for \$/DM terms will be reciprocal of 1.6668, i.e. equal to $\$0.5999/\text{DM}$.

Thus, bid rate in \$/DM quote will be ask rate in DM/\$ quote and ask rate in \$/DM quote will be bid rate in DM/\$ quote.

(f) Cross Rate :

In the foreign exchange markets, it is a practice to quote most of the currencies against dollar, and then it is used to calculate the exchange rate between other currencies with the dollar as the intermediate currency. An example will make this clear.

Suppose, a German merchant wants to find a quote between DM and FF because he is involved in some trade with a French merchant. But he does not find any direct quote for it. So he looks for direct quotes between Deutsche mark dollar and French franc dollar. Suppose, the DM is selling for \$60 in Germany and buying rate for French franc is \$0.15 that will be used by the German trader. Then, the DM/FF cross rate is $\text{DM}1 = \text{FF}4$. As he will sell Deutsche mark and buy French franc to facilitate his trading activities [$\$60/\15].

Mechanism of spot transactions :

In this section, we will explain the mechanism by which transactions are settled in the spot market. Let us start with an example. Suppose an US importer requires FF 1 million to pay his French supplier. After receiving a verbal quote from an US bank of the trader the importer will be asked to specify two accounts.

- (i) The account in a US bank, he wants to be debited for the equivalent dollar amount.
- (ii) The French suppliers account that is to be credited by FF 1 million.

After the verbal agreement is complete, the dealer in the US will provide a dealing slip containing relevant information to the settlement section of the bank. In the same day, a contract note will be issued, which will show the amount of dollar required to be converted in FF for paying the French supplier at the agreed spot rate.

This confirmation will be sent to the importer. After this, the US bank will send a note to its correspondent bank in France to transfer 1 million French Franc from its working

balance to the account specified by the importer. On the value date, the US bank will debit the importer's account and the exporter will have his account credited by the French correspondent bank.

7.2.5 The Forward Market

The other type of market in which foreign exchange transaction takes place is the forward market. A forward contract is one where the parties involved agree to buy or sell a specified amount of one currency against fixed amount of another currency (home currency) on a predetermined future date at a particular exchange rate fixed during the time of the contract.

Forward markets are mostly common in developed countries, while in the developing countries it is still underdeveloped.

The following example will make clear how a transaction actually takes place in the forward market.

In the typical forward transaction, suppose an US company buys textiles from England with payment of £1 million due in 90 days. So importer owes pound for future delivery. Suppose the present price of pound is \$1.71. But over the next three months, the pound may appreciate against dollars, raising the dollar cost of textiles. In order to guard against this exchange risk, the importer can enter into a 90 days forward contract with a bank at a price of £1 = \$1.72, which is slightly higher than the spot rate.

Now according to the forward contract, in 90 days the bank will give the importer \$1.72/£ million and the importer will give the bank \$1.72 million [which is the dollar equivalent of £ 1 million at the forward rate of \$ 1.72].

The gains and losses from a forward contract emerge from the difference between the contracted forward price and the spot price of the underlying currency at the time when the contract matures. In our above example, if the spot price would have been \$ 1.73 or above, after three months, then clearly, there would have been a gain with forward contracts, but if the spot was \$ 1.71 or low, i.e. if pound depreciates then entering into forward contract will cost over importer more.

The following fig. 7.2 plots the importers' dollar cost of textile shipment with and without the use of a forward contract. It also shows the gain and loss from various forward positions.

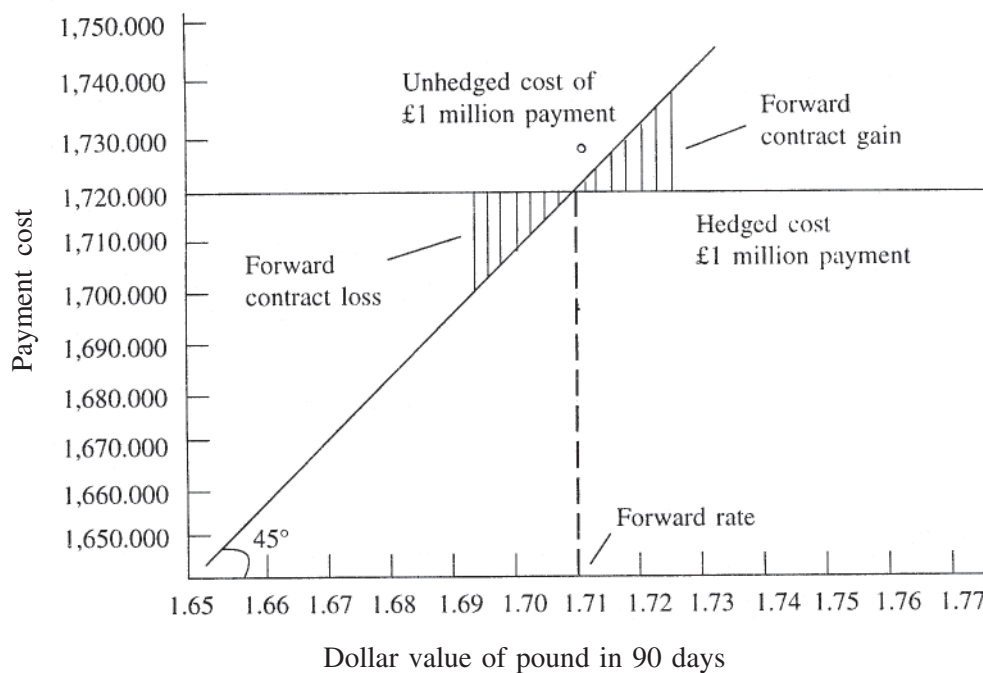


Figure 7.2

In figure 7.2, the dark 45° line shows the various amount the importer has to pay corresponding to the daily exchange rates. If the exchange rate is above \$ 1.72, then, there is gain by forward contract, and if it is less than \$ 1.72, then there is loss due to forward contract.

Forward contracts are generally used by hedgers, mostly multinational firms, to protect the home currency value of various foreign currency denominated assets and liabilities in their balance sheets. Apart from the hedgers, speculators, arbitrageurs and traders also may participate in forward market. Forward contracts are actually a part of the derivative market, which we will discuss later.

(a) Forward Quotations :

Forward quotations may be expressed in three different ways. Generally, commercial customers usually quote the actual price, which is known as the outright rate. But nowadays, point or swap rates are more common than outright rate. Apart from these, in the interbank market dealers quote the forward rate only as a discount form or as a premium on the spot rate.

Below, we will show how exchange rates are expressed in different formats starting with outright expression.

(i) The outright expression :

Generally, we see this format in the print medias. Below we have stated a format for the outright expression. An example of different outright rates of rupees against dollar is given below :

	Buy \$ [Foreign currency]	Sell \$ [Foreign currency]
Spot rate	47.4803	48.2901
1 month forwards	48.5000	49.5000
6 months forwards	49.5000	50.4600

(ii) Point or Swap rates :

In this system, the exchange rates are displayed in a particular fashion such that the buying rates are displayed first and then by using a hyphen we write the last two digits of the selling rates which are displayed different from buying rates. Let us again, look at an example. The spot and forward rate for DM/\$ are given as :

Spot rate	–	DM 2.2605/15
3 months forward rate	–	DM 199/192

In the above example, it shows that spot rate for buying 1 dollar in Germany is DM 2.2605 and selling rate is 2.2615.

(iii) Conversion from Swap rate to Outright :

The swap rates can be converted into outright rates in the following way. From the above example in which we have shown the swap rate, we can obtain the outright rates as follows :

Table : 7.2

	Buy \$	Sell \$
Spot	2.2605	2.2615
3 months	2.2406	2.2423
Forward	[2.2605 – .0199]	[2.2615 – .0192]

In the above table, we have subtracted 199 and 192 from the spot rates in order to find the 3 months forward rate in the outright format. As the first number in the 3 months forward swap rate is larger than the second number, it indicates that domestic currencies are appreciating (Deutsche Mark has appreciated). But if the first number was smaller than the second number, we would have to subtract them from the spot rate in order to get the

three months forward rate. It would show that the home currency has depreciated. That is, if 3 months forward swap rate was (DM 200/192) then we would have to add to the spot rate to obtain the forward rates in the outright format.

(iv) Premium or discount :

This is the most important format and is most commonly in use nowadays. A currency is said to be at premium against another if it is more expensive in the forward market than in the spot market. That is, if the forward market rate of a currency is higher than the spot market rate, then that currency is said to be at premium. But if the spot market rate is higher than the forward market rate then the currency is said to be at discount.

The formula for premium or discount is given below :

$$\text{Premium/Discount} = \frac{\text{Forward} - \text{Spot}}{\text{Spot}} \times \frac{12}{n} \times 100$$

where n = number of months of forward rate. [For 3 months forward n = 3]

If the spot and the forward exchange rates are expressed in indirect quotes, then formula for premium or discount is

$$= \frac{\text{Spot} - \text{forward}}{\text{forward}} \times \frac{12}{n} \times 100$$

7.3 Derivatives Options, Futures and Swaps

One major disadvantage of using a forward contract is that it does not allow the holder of the contract to have any windfall gain. That is, the holder of a forward contract must make his contract on maturity to reap gain. So we look forward towards more sophisticated financial instruments, which may be more flexibly used by its holder. Options or futures contracts are new breeds of financial instruments which have emerged in the financial market to hedge risk. Both options and futures are part of the derivative markets.

The financial instruments, whose values depend on the price of some other assets, are called derivatives. For example, value of a stock option depends on the price of the underlying asset. If the underlying asset is wheat, the value of the option will depend upon the price of wheat in the market.

Derivatives are of three types :

- 1) Options
- 2) Futures
- 3) Swaps.

In this section and next, we will discuss how a currency option, a currency future and swaps are used in a foreign exchange market.

7.3.1 The size of the derivatives market

By 1970, the fixed exchange rate regime came to an end with the fall of the Bretton Woods Agreement. A new system emerged where most of the countries adopted flexible exchange rate system, thus making exchange rates more vulnerable to wild fluctuations, determined by market forces. By 1980, the financial markets all over the world were undergoing a process of liberalization and deregulation. The deregulation of the financial markets eventually led to its integration with different markets creating favourable conditions for free mobility of capital. This enhanced the risks involved in cross border transactions and risk diversification took the central stage of international capital flows. This logically led innovation of various risk hedging techniques, first in the forex market and then in the financial service industry. These techniques have come to be known as derivatives.

7.3.2 Options

An option may be defined as the right but not the obligation to buy or sell the specific quantity of a specific asset at a fixed price at or before a future date.

The difference between an option and a forward market is that, in case of an option, it depends upon the will of the option holder to utilize the option.

The following example will make the fact clear. Suppose, a person wants to buy 100 shares after three months from now. So he may approach a person, who is willing to sell 100 shares after three months [i.e. writer] say at a cost of Rs. 5/- fixed at the moment. After the option is bought the option holder has the right whether to utilize the option or not. If the market price after three months exceeds Rs. 5/- then the option holder would benefit by utilizing the option, as the price fixed in the option Rs. 5/- is less than market price. But if the market price is less than the option price, then the option holder's benefit would be not to utilize the option, and instead purchase the shares at the market price, but for all this, the buyer of the option has to pay something to the person, who is selling it. Thus unlike forward contract, the option contracts are more flexible and depends on the will of its holder to use it or not.

Options are generally of two types : Call option and Put option.

● Call Option

An option giving the buyer the right to purchase the underlying asset at a fixed exercise price at or before expiration is called a call option.

- **Put Option :**

An option which gives the right to sell the underlying asset at a fixed price at or before the expiration date is called the put option. So, if a person wants to buy something he will purchase a call option and if a person wants to sell some assets he will purchase a put option.

- **Underlying assets :** Assets, on which the option is written, is known as the underlying assets. For example, when a person buys a call option, regarding purchasing a land, then the underlying asset is land.

- **Strike price :** In our example, we have mentioned that the price fixed when the option was bought was Rs. 5/-. This price, at which the option holder may buy or sell the underlying asset when the option is exercised is called the strike price.

- **In the money :** When exercising an option would provide an advantage over buying and selling the underlying asset currently in the open market, the option is said to be in the money.

- **Out of money :** When exercising an option would not provide an advantage over buying or selling the underlying asset currently in the market, then the option is said to be out of money.

In our example given before, if the market price was Rs. 6/-, then using the option would have resulted in a gain of Rs. 1/-. This is which we call “in the money”. But if the market price was Rs. 4/-, then using the option would mean a loss of Rs. 1/-. This is when we call “out of money”.

- **Writer :** A person, who sells the option at a fixed premium, is called a writer. Whether a person uses or does not use an option, the fixed premium must always be paid to the writer during the purchase of the option.

- **Exercise value :** It shows the amount of advantage as “in the money” option provides over buying or selling the underlying assets currently in the market.

In our example, if the market price was Rs. 6/- per share then it would have cost Rs. 600/- for purchase of 100 shares. But by using the option, the cost of 100 shares is Rs. 500/-. So option user would gain Rs. 100/-. This amount is called the exercise value or the intrinsic value of the option.

- **Expiration :** An option expiration is the point in time when the option contract ceases to exist, i.e., the point at which the option contracts expire or die.

Depending on the expiration date, we can further classify two types of options :

- i) **American Option :** An option that can be exercised at any time prior to its expiration is called an American option.

- ii) **European Option :** An option that can be exercised only at the end of the contract and not before is called a European option.

Using Currency Option : As a Tool to Hedge Risk

To see how currency options might be used, consider a US importer who has a DM 62500 payment to make to a German exporter in 60 days. The importer could purchase a European call option to have Deutsche mark delivered to it at the strike price. Suppose, the option premium is \$0.02, per DM, and the strike price is \$ 0.64. So, the importer has to pay \$ 1250 as premium for the right to buy the option, which will expire after 60 days.

Now, suppose, at the time, the value of Deutsche Mark rises to say \$0.70. So, the option would be “in—the—money”. In this case, the exercise value of the call option would be $(62500 \times .06) = \$ 3750$, where $0.06 = (0.70 - 0.64)$ is the gain for exercising the option, and would more than cover \$ 1250 cost of option. But if the rate has declined before the contracted rate, say to \$ 0.60, then the option would be out of money, and the importer will let the option expire and purchase the Deutsche mark in the spot market. Fig. 7.3 illustrates this.

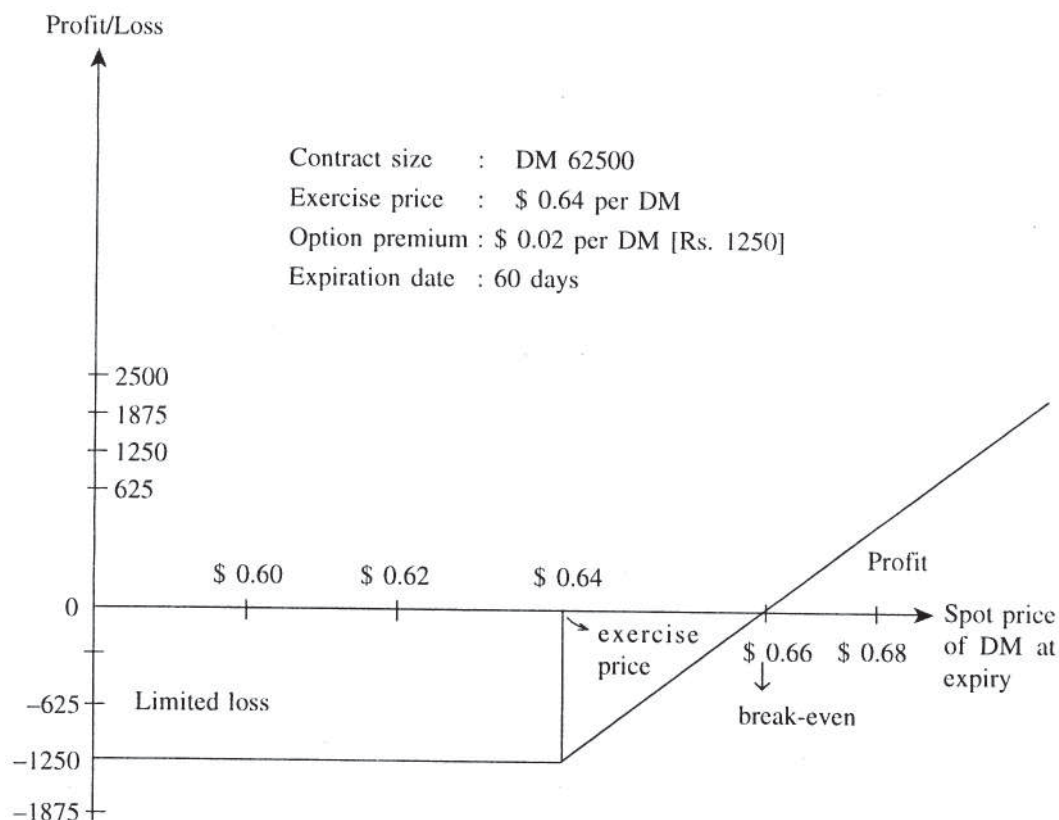


Figure 7.3

Figure 7.3 shows importer's gains or losses on call option. At spot rate on expiration of \$ 0.64 or lower, the option will not be exercised, resulting in a loss of \$ 1250 option

premium. Between \$0.64 and \$0.66, the option will be exercised but the gain is insufficient to cover the premium. The break-even price is where the gain on the option is just equal the option premium i.e. \$0.66.

In contrast, a put option at the same terms (exercise price of \$.64 and put premium of \$0.02 per DM) would be in—the—money at a spot price of \$0.60 [when price is less, then the sellers will use the option in order to gain] and out of money at \$0.70 [as now current spot rate is more, so sellers will use that spot rate to sell in the market]. Fig. 7.4 illustrates the profit and loss possibilities on a put option.

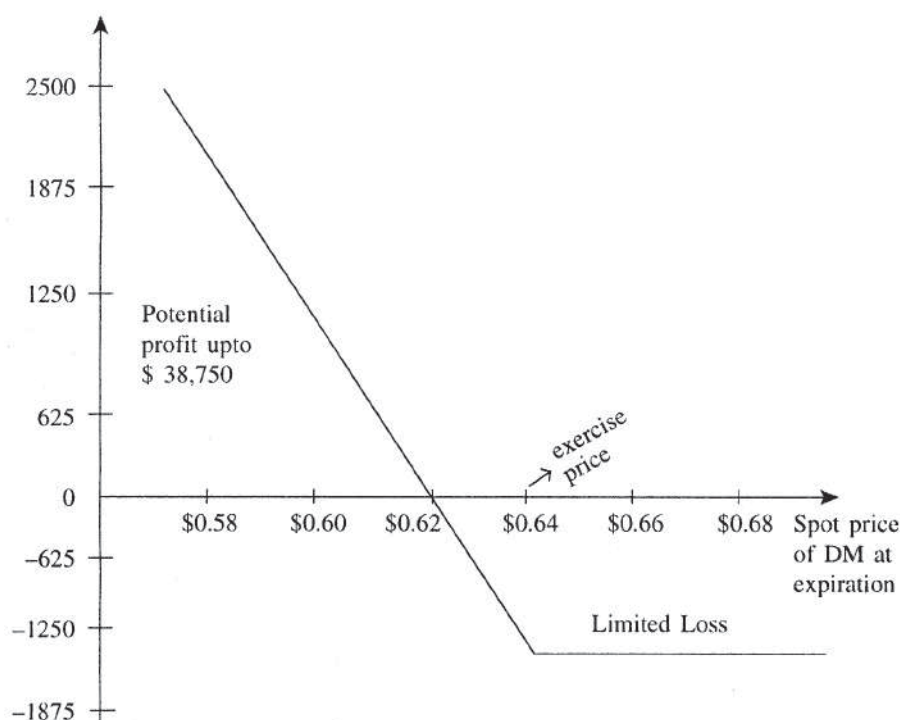


Figure 7.4

In this figure, if the spot price falls to \$0.58, the holder of a put option will sell DM 62500 at the exercise rate \$0.64 to get $\$40,000 = (0.64 \times 62500)$ by using the put option, and will gain \$3750. This gain arises as $0.64 \times 62500 - 0.58 \times 62500 = \3750 . And ultimately the net profit would be \$2500 after paying the premium. At the extreme, if the spot rate falls to 0, the buyers' profit on contract would be \$38,750 $[(.64 \times 62500) - 1250]$, below a spot rate of \$0.62, the gain on the put option will more than cover \$1250. Between, 0.62, the break-even-even price and 0.64, the holder will exercise the option, but the gain will be less than the option premium. At spot prices above \$0.64, the option holder will not exercise the option.

General users of currency options are financial firms holding large investments overseas where sizeable unrealized gain had occurred because of exchange rate changes and where these gains were thought likely to be partially or fully reverse.

7.3.3 Future Contracts

Other than options, another type of derivatives is the future contract. A currency future contract provides simultaneously right and obligation to buy or sell a standard amount of a particular currency on a specific future date, at a price that is known at the time of entering the contract.

In the definition of futures, it is said that it is both the right and the obligation to buy or sell a specific amount of a particular currency. This means that a person who will hold the future contract till its maturity must buy or sell at the rate that would be prevailing at that time, but there is no obligation on his part to hold the currency future till the maturity date. If he wants, he can sell the contract before the maturity at the rate prevailing on that day.

Future contracts are generally controlled by future clearing houses, which provide a guarantee that transactions take place according to the rules of the contract. Clearing house acts as futures exchange. Its objective is to provide guarantees both sides of each two-sided contract, that is, the contract to buy and the contract to sell. The willingness to buy versus the willingness to sell moves futures prices up and down to maintain a balance between the number of buy and sell orders. The market-clearing price is reached in the vibrant, somewhat chaotic-appearing trading pit of the futures exchange. Currency futures began trading in the International Money Market (IMM) of the Chicago Mercantile Exchange in 1972. Since then many other markets have opened, including the COMEX commodities exchange in New York, the Chicago Board of Trade and the London International Financial Futures Exchange (LIFFE). In case of any mismatch, the clearing house will have to bear the responsibility. But initially, both the parties involved in the contract will have to deposit a fixed amount upon which the daily gain or losses will be adjusted.

The main mechanism is that profits and losses of future contracts are paid over every day at the end of trading. The example will illustrate clearly this settlement process.

Suppose on Tuesday morning, an investor purchases a future contract that matures on Thursday afternoon. Suppose the agreed upon price is \$0.75/Swiss franc and the contract size is of Sr FF 125000. Suppose at the close of trading the future price has risen to \$0.755/Swiss franc. As a result of this, the investor will make a profit of \$625 (125000×0.005). The existing future contracts with a price of \$0.75 will be cancelled. And the

investor at the new price of \$0.755 receives a new contract. Thus the value of future contract is set to zero at the end of each trading day.

Now suppose at Wednesday close, the price has declined to \$0.752. Then, the investor must pay the \$375 loss (125000×0.003) to the other side of the contract party, and trade in his old contract for a new one with a price of \$.752. At Thursday close the price drops to \$0.74 and the contract matures. The investor pays \$1500 loss to the other side and takes the delivery of the Swiss francs, paying the prevailing price of \$0.74.

The table below shows the details of daily settlement process :

Table-7.3

<u>Time</u>	<u>Action</u>	<u>Cash Flow</u>
Tuesday morning	Investor buys Sw. Fr, future contract that matures in two days, Price is \$0.75	None
Tuesday close	Further price rises to \$0.755	Investor receives $125000 \times (0.755 - 0.75)$ = \$625
Wednesday close	Future price drops to \$0.752	Investor pays $125000 \times (0.755 - 0.752)$ = \$375
Thursday close	Future price drops to \$0.75 Investor takes delivery of Sr. FF 12500	Investor pays $125000 \times (0.752 - 0.74)$ = \$1500
		At the end, the investor receives \$92,500 at the prevailing rate of \$0.74/Sr. FF = (125000×0.74)

Thus from the above example we find how daily settlements take place with a future contract. Compared to the forward contract, future contracts have certain advantages. Daily settlement process reduces the default risk of future contracts compared to forward contracts. Every day the future investors must pay over the losses or receive any gain from the day's price movements. Thus, insolvency an investor with an unprofitable position would be forced into default after a day's trading, rather than being allowed to build up huge losses. Another important feature of future contract is that, if an investor finds that his present position in future trading is profitable, then he need not literally wait till the maturity period of the contract, but may take delivery even before the maturity period is completed.

Further, the smaller size of a future contract and freedom to liquidate the contract at any time before its maturity in a well organized futures market is another advantage of future contract over forward contracts and hence attract many users.

On the other hand, one disadvantage of the future contracts is that limited number of currencies are traded via future contracts with the limited delivery dates and the rigid contractual amounts of currencies to be delivered. Further, the future contract sizes and maturities are standardized i.e. fixed according to the amount of foreign currency. For example, standardized future contracts fixed amount like are in different countries 62,500 in UK, C\$100000 in Canada, S.Fr. 125000 in Switzerland etc. Due to all these disadvantages, the contracts are of value mainly to those commercial customers who have a fairly stable and continuous stream of payments of receipts in the traded foreign currencies.

Table 7.4 makes a comparative assessment of currency future, option and forward contract.

Table 7.4
Forward, Futures and Options Compared

	Forward Contracts	Currency Futures	Currency Options
Delivery discretion	None	None	Buyer's discretion. Seller must honour if buyer exercises.
Maturity date	Any date	Third Wednesday of March, June, September or December	Friday before third Wednesday of March, June, September or December on regular options. Last Friday of month on end-of-month options
Maximum Length	Several years	12 months	9 months
Contracted amount	Any value	£62,500, Can \$100,000, etc.	£31,250, Can \$50,000, etc.
Secondary market	Must offset with bank	Can sell via exchange	Can sell via exchange
Margin requirement	Informal; often line of credit or 5-10% on account	Formal fixed sum per contract, e.g., \$2,000. Daily marking to market	No margin for buyer who pays for contract. Seller posts 130% of premium plus lump sum varying with intrinsic value
Contract variety	Swap or outright form	Outright	Outright
Guarantor	None	Futures clearing corporation	Options clearing corporation
Major users	Primary hedgers	Primarily speculators	Hedgers and speculators

7.3.4 Currency Swaps

A transaction whereby two currencies are exchanged by the parties involved, only to be exchanged back, is termed as currency swap. A swap is nothing but selling of a currency at a point of time and then buying it back. The term swap has three different but related meanings in the context of international finance :

- (i) The spot purchase and simultaneous forward sale of a currency.
- (ii) Simultaneous loans in two currencies.
- (iii) The exchange of debt servicing liabilities of the exchange of beneficial ownership assets.

Let us take some examples to show how a swap may be used to hedge risk while trading with currencies. Let us assume that a Canadian citizen is investing in a US bonds, and so he knows the amount he will be receiving in maturity. But he is not quite sure about US \$/Can \$ exchange rate that would prevail at that time. Then, if Canadian dollar appreciates, he would be facing loss. To remove this, the investor can enter into a swap in dollars, whereby he would buy dollar spot (investing them in US bonds) and sell them forward at the time of maturity. This would fix the exchange rate at which he would translate his dollar earnings to Can \$, thus making his Can \$ returns certain.

Thus by a simple work the investor can overcome the total risk involved with exchange rate trading. In the above examples, the person bought in the spot market and sold it forward to overcome the risk.

Apart from eliminating risk emerging from trade, swapping can also be used to exchange debt-servicing liabilities. A company may wish to exchange a liability in one currency for a liability in another, in order to reduce exposure.

Suppose there are two companies, A and B. Company A raises capital in UK and invests in US and the company B raises capital in US and invests in UK. So, if sterling strengthens the Company A will be at a loss, and if dollar strengthens, company B is at a loss, as both the companies have exchange rate exposures, having assets in one currency and liability in another. Now suppose to hedge this risk, both enter into a swap agreement. This is possible, when borrower A agrees to meet the interest and principal payments of borrower B, dollar liability, by making the dollar payments to borrower B via the bank, while borrower B, makes similar commitment to service borrower A of a sterling debt. They operate as a counter party to both and borrower A and B need not know the others' identity. The bank runs the risk of losses arising from default by one of the parties and any gain or loss due to appreciation or depreciation of \$/£ exchange rate will also be faced by it.

7.4 Exchange Rate Arrangement in India—LERMS

Now let us discuss briefly, how exchange rates are managed and controlled in India by the Reserve Bank of India.

India's external condition was severe and had almost reached the brink of collapse by 1991 under the severe debt crisis and huge fiscal deficits creating a problem of monetary overhang and endangering price stability. Along with this, the huge tariffs, at around 300% and stringent capital and exchange controls dwindling most of the capital inflows away from India. The gulf crisis further worsened the situation and under such grave conditions the RBI in March 1992 was left with no other option but to introduce LERM, Liberalized Exchange Rate Management (LERM), the dual exchange rate management system.

Under the new arrangement, the control over the exchange rate was freed to a considerable extent with the partial flotation of rupee in February 1992.

There were two rates, at which exchange could be made, one was the official rate and the other is the inter-bank free market determined rate.

The followings were the modifications made under LERMS :

(1) With the introduction of LERMS, the RBI became obliged to supply foreign exchange to the authorized dealers only for import of certain specific items authorized by the Ministry of Finance. These items were the main Government department needs. Crude oil, diesel, kerosene, Fertilizers and other specified imports.

(2) Authorized dealers of foreign exchange were required to ensure that they surrendered 40 percent of entire value of the exports to the RBI, at the official rate and maintain a square position in their daily foreign currency holding.

(3) For exporters and others, under the new system, 60% of their foreign exchange earning could be exchanged at free market rate and the balance 40% at the official rate.

(4) For the importers, on the other hand, the new system meant that they have to acquire their foreign exchange fully [100%] at the free market rate.

(5) There were certain exceptions to the rules of LERMS. Certain imports such as those made under special licenses granted under the import policy were eligible for foreign exchange availability at official rate, for example, the imports of life saving drugs.

(6) The RBI recognized the US Dollar as the currency in which the major external trade is to be conducted and replaced sterling which was used before 1992. Thus the central bank announced that it would sell only dollars to the authorized dealers at spot

rates, while continue to buy from them dollar, pound, Deutsche mark and yen both spot and forward.

But LERMS was considered discriminatory for the exporters, because though importers were allowed to exchange at free market rate, exporters were to surrender 40% of their earnings at the pegged official rate, which would mean that the earnings of the exporters would be reduced significantly. Thus, the government was, in fact, imposing a tax on exporters in the form of compulsory conversion of part of their export proceeds at the official rate. This move would destabilize the BoP in the long run. Thus in March 1993, some modifications were introduced in LERMS.

In the new arrangement, the dual exchange rate system was replaced by a unified exchange rate system. And exporters do no longer have to surrender a part of their earnings at the official rate, as was the case for the past one year.

The exporters now can sell their foreign exchange earnings to the authorized dealers at the market rate of exchange, but the RBI, still would intervene by buying and selling foreign exchange reserves and fixing the official rate on the basis of prevailing market rate. Thus the modifications of LERMS envisaged four things :

- (1) All foreign exchange transactions are put through by the authorized dealers at market-determined rates of exchange.
- (2) Authorized dealers would no more have to surrender any portion of their foreign exchange receipts to the RBI.
- (3) Authorized dealers could sell foreign exchange only for permissible transactions.
- (4) The RBI would sell foreign exchange to the authorized dealers only for those purposes as were approved by the Government of India.

7.5 Exchange Rate Exposures

With the emergence of the flexible exchange rate system, the exchange rate fluctuations were inevitable and it often led to loss or gain in the transactions exposed to such fluctuations. Foreign exchange exposure is the sensitivity of changes in the real domestic currency value of assets and liabilities due to its unanticipated changes in exchange rates.

Let us take the help of an example to explain, in detail, the concept of exposure. Let us suppose that an Indian resident holds a dollar deposit and the dollar value changes vis-a-vis the rupee.

This makes the dollar deposit exposed to exchange rate changes. On the other hand, for a person holding a debenture in an Indian company, the value of the debenture may change due to an increase in general interest rates, which, in turn, may be the effect of a depreciating rupee. Thus even without conversion of currency, a domestic asset can be exposed to the movement in the exchange rates.

Another point which must also be taken care of, is that, not only assets and liabilities but also even operating incomes can be exposed to exchange rate fluctuations. A very simple example would be a firm exporting its products. Any change in the exchange rate is likely to result in a change in the firm's revenue in terms of domestic currency.

Finally, we should also note that exposures measure the change only to the unexpected changes in the exchange rate. Exposures are also of different kinds.

Generally there are three kinds of exposures :

- (1) Transaction exposure.
- (2) Translation exposure.
- (3) Economic or operating exposure.

(1) Transaction Exposure :

Transaction exposures occur from transactions, which are denominated in foreign currencies.

An example will make it clear. Suppose an Indian firm has entered into a contract to sell computers at fixed price which is denominated in foreign currencies [say dollar]. Then the firm will be exposed to Re/\$ exchange rate movements, till it receives the payment and converts it into domestic currency. Any appreciation in the exchange rate of the country in which the firm is situated i.e. appreciation of Rs. will lead to loss of the firm and depreciation will lead to gain.

Here, in the example, as the invoicing is done by dollars, so the risk of exposure is borne by the Indian firm in converting it to rupees. But if the invoicing (i.e., the agreement in which currency the price is to be paid) were done in rupees, then the risk would have been borne by the foreign trader.

(2) Translation Exposure :

Translation exposure arises, when it is required to convert values of assets and liabilities denominated in one currency to another currency. For example, a MNC having subsidiaries in different countries would need to translate revenues, emerging from its subsidiaries in different countries into domestic currency (of the MNCs' parent country) for the purpose of reporting at the time of preparation of its consolidated financial statements.

Thus exposure arising due to exchange rate movements and the resultant change in the domestic—currency value of the deposit would be clarified as translation exposure. Movement of translation exposure depends on the different accounting policies followed for the purpose of converting the foreign currency value of assets and liabilities into the domestic currency. In general there are four different methods for measuring translation exposures.

They are :

- a) Current—Non-current method.
- b) Monetary/Non-Monetary method.
- c) Current rate method.

a) The Current—Non-current method :

This method depends on the fact that whether the exposure is linked to the current assets or liabilities or to non-current assets or liabilities. Only those assets and liabilities, which are currently exposed, are converted with the recent exchange rate and all non-current assets or liabilities are converted at the historic rate, i.e., the rate at which the non-current transactions were actually settled.

The following example will make the process clear.

Let us suppose that an Indian company has the following foreign currency assets and liabilities :

Cash flow	:	\$ 10,000
Long term loan	:	\$ 12,000
Real estate	:	\$ 15,000

Suppose the exchange rate at the beginning of the year was Rs. 42/-/\$, and at the end of the year was Rs. 43/-/\$. Suppose the historic rate was Rs. 32/-/\$ [i.e., the rate when real asset was purchased in US]

At the beginning of the year, the assets and liabilities will be translated at :

Cash flow	:	\$ 10,000	@ Rs. 42/-	= Rs. 42,0000/-
Real estate	:	\$ 15,000	@ Rs. 82/-	= Rs. 48,0000/-
Long term loan	:	\$ 12,000	@ Rs. 42/-	= Rs. 50,4000/-

Net foreign currency assets

$$= [\text{Rs. } 420000 + 480000 - \text{Rs. } 504000 = \text{Rs. } 396000]$$

At the end of the year, assets and liabilities will be :

Cash flow	:	\$ 10,000	@ Rs. 43/\$	= Rs. 43,0000/-
Real estate	:	\$ 15,000	@ Rs. 32/\$	= Rs. 48,0000/-
Long term loan	:	\$ 12,000	@ Rs. 43/\$	= Rs. 51,6000/-

Thus,

$$\begin{aligned}\text{Net foreign currency asset} &= (\text{Rs. } 430000 + \text{Rs. } 480000 - \text{Rs. } 516000) \\ &= \text{Rs. } 394000\end{aligned}$$

The difference between Rs. 396000 and Rs. 394000 (i.e. Rs. 2000) will be booked as exchange loss in the profit and loss account.

b) The Current Rate Method

In this method, all assets and liabilities, incomes and expenditures are translated at the current or closing rate. But here only capital stock is converted via the historic rate, in which it was purchased, while other things remain the same.

c) The Monetary-Non Monetary Method :

In this method, the assets and liabilities are classified as monetary and non-monetary items. Monetary items are money held and assets and liabilities to be received or paid in line with determinable amounts of money. Under the method, the monetary assets and liabilities are translated at the current market rate and non-monetary items like inventory, building are translated at the historical rate.

(3) Economic Exposures

Economic exposure is defined as the value of a firm which stands exposed to the exchange rate movements, the firm value being measured by the present value of its expected cash flows.

The economic exposure actually measures the impact of unexpected changes in exchange rates on these cash flows. The different cash flows which arise, are due to earnings from exports, or other returns, subtracting the cost of machineries, i.e.,

$$\text{Cash flow} = \frac{\text{Estimated Revenue} - \text{Estimated cost}}{\text{Estimated Revenue}}$$

The net present value (NPV) is calculated as :

$$\text{NPV}_0 = \text{CF}_0 + \text{CF}_1/(1 + r) + \text{CF}_2/(1 + r)^2 + \dots$$

where CF_0 , CF_1 , ... etc. stand for the cash flows in period 0, 1, ... respectively.

Now if the exchange rate changes, then revenue and costs, denominated in foreign currency, change and hence the cash flow also changes, thus changing the net present value. The changed net present value will be different from the previous one, and the extent

of change will give the economic exposure. If the new net present value is NPV_1 , then Economic exposure is $= NPV_1 - NPV_0$.

Another important point to be noted in this context is that, exposures arising out of contractually fixed cash flows can be managed using various techniques, but if exposures arise out of cash flows that are not fixed contractually or where the change in the domestic currency value as a result of exchange rate movements can not be predicted exactly, these techniques become ineffective.

Regarding changes in cash flows, we should keep in mind, that inflation in a particular country may also change cash flows, but if purchasing power parity holds then the exchange rate of that country will also depreciate simultaneously and hence there will be no change in cash flows. Thus, if purchasing power parity holds good, then even wide fluctuations in exchange rate will not affect cash flows. But, on the other hand, if exchange rate is relatively stable and if there is inflationary pressure, then it will obviously affect the cash flows.

7.6 Management of Exposures

Management of exposures means reduction or elimination of exchange rate risk through hedging. Let us start our analysis by discussing different techniques of how to manage translation and transaction exposures. The basic instruments via which these can be managed are, broadly, classified as internal and external techniques. Internal instruments are those which are a part of day-to-day operations of a company, while external instruments are ones, which are not part of the day-to-day operations and are, especially, taken for the purpose of hedging exchange rate risk.

7.6.1 Internal Techniques

The various internal techniques used for hedging risk are :

- i) Exposure Netting.
- ii) Leading and lagging.
- iii) Hedging by choosing the currency of invoicing.

(i) Exposure Netting

Exposure netting involves creating exposures in the normal course of business, which offset the existing exposures. The exposures created should be such that any movement in the exchange rate that results in a loss on the original exposure should result in a gain on the new exposure. This may be achieved by creating an opposite exposure in the same

currency or with a currency, which moves in tandem with the currency of the original exposure. This may also be achieved by creating an exposure in the currency, which moves in the opposite direction to the currency of original exposure.

(ii) Leading and Lagging

Leading and lagging are certain payment policies, which can also be used to hedge exposures. Leading involves advancing a payment, i.e., making a payment before it is due, and lagging on the other hand, refers to postponement of payments. A company can lead payments required to be made in a currency that is likely to appreciate and lag payments that it needs to make in a currency that is likely to depreciate.

(iii) Hedging by choosing the currency of invoicing

One very simple way to eliminate transaction and translation exposure is to invoice all receivable and payables in the domestic currency. That is, suppose an Indian company selling computers to an American importer may fix the price of the computer in rupees, thus eliminating any exchange risk.

7.6.2 Various External Hedging Techniques

The various external hedging techniques are :

- (i) Forwards.
- (ii) Options.
- (iii) Futures.

(i) Hedging through Forward Market

Hedging through forward market can best be explained, if we take an example. Suppose an Indian firm is importing computers from the US and needs to pay \$ 100000 after 3 months to the exporter. So, one-way is to book a 3 months forward contract to buy \$ 100000. Thus in this way, the firm can lock the rate at which the transaction is to take place and thus will be totally aware of the amount it is going to get \$ 100000 after 3 months. If the 3-months forward rate is Rs. 42.50/\$, then the cost to the Indian firm will be locked at Rs. 4250000. But there is an opportunity cost also in this technique, which depends upon the expected spot rate at which the currency needs to be bought and sold in the absence of forward contract. If the spot rate after 3 months is lower than Rs. 42.50/\$, i.e., around Rs. 40.50/\$, then the firm will face a loss by dealing with the forward rates. Hence, the cost of forward hedge is the difference between forward rates and the expected spot rate.

(ii) Hedging Through Futures

Hedging through futures is also somewhat similar to hedging through forward. Here also, if an importer need to pay \$ 5,000 after four months, he can buy dollar futures for the required sum and maturity. But the difference of hedging through futures and through forward is that while in forward contract the whole payment takes place at the time of maturity of the contract, in case of futures there has been continuous payments during the tenure of the contract on the basis of market movements.

(iii) Hedging through Options

Options are also quite useful as a tool for hedging transaction and translation exposure. A firm having a foreign currency receivable can buy a put option on the currency, having the same maturity as the receivable. Conversely, a firm having a foreign currency payable can buy a call option on the currency with the same maturity.

Hedging through options has an advantage over hedging through forwards, because, in this case the firm is not in an obligation to buy or sell the foreign currency at the strike price. If it wants it can allow the option to expire.

7.6.3 Management of Economic Exposures

The risk in economic exposures arises due to unpredictable change in cash flow due to unanticipated change in the exchange rates. Different strategies are adopted to hedge from exchange rate changes depending upon the duration of change. There are different marketing strategies, which may be required to hedge the economic exposures, which are listed below :

- (i) Market selection.
- (ii) Pricing strategy.
- (iii) Promotional strategy.
- (iv) Product strategy.

(i) Market selection

This strategy is useful when any change in exchange rate is supposed to last for a long time. This method involves selection of market in which firm wants to market its product. Thus firms may pull out of the market, which have become unprofitable due to depreciation of currency and enter those markets, which have become attractive due to continuous appreciation.

(ii) Pricing strategy

There are two main issues involved in developing a pricing strategy—the choice between market share and the frequency of price adjustments. Suppose the domestic

currency appreciates, (i.e. it becomes costlier compared to foreign currency), then the firm may either reduce the domestic price, thus maintaining foreign price at the same level, thus reducing profit margin or, it may increase the foreign price by maintaining the domestic price, thereby losing foreign market share.

Similarly, if the domestic currency depreciates, then firm can increase profit margin by increasing the domestic price or maintaining the domestic price level at the same level thus reducing foreign currency price to increase its market share.

Similarly, a company facing competition from imported goods faces a similar situation. When domestic currency appreciates, making imports cheaper, then the firm producing import competing goods may either keep the price of its product unchanged thus risking a reduction in market share, thus reducing overall profit level or reducing price thus reducing the profit margin.

(iii) Promotional Strategy

A firm's decision in promoting its product needs to take the exchange rate movement into consideration. A change in the exchange rate would change the domestic currency cost of overseas promotion. For example, a depreciation of domestic currency may increase the competitiveness of its export firms, thus increasing the expected revenue per unit of promotional cost, and thus may persuade the firm to increase promotional activities.

(iv) Product strategies

A firm can use product strategy to launch a new product in a market. When the domestic currency is depreciating and the firm is in a competitive position, then it would be the best time to launch a new product. But when conditions are unfavourable, the best way is to hold back the products.

7.7 Let Us Sum Up

We have learnt in this unit about the foreign exchange market. First, we have noted what is spot and what is forward market and the relationship between them. Also, we have noted the different methods of quoting spot and forward rates. With the emergence of flexible exchange rate regime after the collapse of the Bretton Woods system, financial derivatives became important as instruments to hedge against exchange risks. We have noted how exchange risks, arising out of exchange rate fluctuations, can be hedged using either currency futures or options or swaps.

Foreign exchange transactions and/or investment abroad give rise to different exchange exposure which may lead to losses to the traders and investors. There are different types of exposures—transaction exposures, translation exposures and economic or operating exposures. Techniques available to hedge such exposures are of two types : internal and external.

India adopted new exchange rate management system, called Liberalised Exchange Rate Management System (LERMS), when the liberalization was unleashed. This management system was later modified to accommodate the interests of exporters.

7.8 Questions

- (i) Discuss the functions of a forex market.
- (ii) Describe the participants in a forex market.
- (iii) What is spot exchange rate? Illustrate with suitable examples the concepts of direct and indirect quotes, bid and ask rates, inter-bank and merchant quotes and cross rate.
- (iv) What is forward rate? Describe different forward quotations with suitable examples.
- (v) What is financial derivative?
- (vi) Define option, call and put option. Describe how options are used to hedge exchange risk.
- (vii) Define futures contract. Describe how it is used to hedge exchange risk.
- (viii) What is currency swap? Explain it with an example.
- (ix) Describe Liberalised Exchange Rate Management System (LERMS) in India.
- (x) What do you mean by the exchange rate exposures? What are the different types of exposures? Explain them.
- (xi) Describe different techniques to manage exchange rate exposure.
- (xii) On April 1, the spot price of the German Deutsch mark was \$1.86 and the price of the June futures contract was \$1.85. During April, the Deutsch mark appreciated, so that by May 1 it was selling for \$1.91. What do you think happened to the price of the June Deutsch mark futures contract April? Explain.
- (xiii) On Monday morning, an investor takes a long position in a pound futures contract that matures on Wednesday afternoon. The agreed-upon price is \$1.78 for £62,500. At the close of trading on Monday, the futures price has risen to \$1.79. At Tuesday close, the price rises further to \$1.80. At Wednesday close, the price falls to \$1.785, and the contract matures. The investor takes delivery of the pounds at the prevailing price of \$1.796. Detail the daily settlement process. What will be the investor's profit (loss)?

7.9 References

Levie, Maurice D., International Finance, Third Edition; Mc-Graw-Hill International Editions; 1996.

Unit 8 □ International Monetary System and Regional Economic Cooperation

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8.0 Objectives

By the time you have studied this unit, you should be able to :

- Explain the history of international monetary system.
- Explain the functions of IMF.
- Explain the functions of the World Bank and its affiliates.
- Explain the evolution of GATT.
- Explain the functions of the World Trade Organisation (WTO)

8.1 Introduction

In this unit, we would be discussing about various economic systems which prevailed in the world at different points of time. We will be starting with the gold standard and then proceed to discuss the Bretton Woods System established in 1944. In the new economic order, which came into 1944, priority was given to maintain a stable exchange rate system and provide for a multilateral credit system. In the conference, formulation of three international institutions were agreed upon : (i) The International Monetary Fund (IMF), (ii) The International Bank for Reconstruction and Development or the World Bank and (iii) The International Trade Organisation (ITO). The IMF was given the responsibility to look after the short term BoP problems among its member countries. The IBRD, which later came to be known as the World Bank, was given the role to channel international investment to the member countries. ITO was supposed to promote multilateral trade among member countries. But due to internal conflict among member countries, the ITO was never established and a general agreement relating to reduction of tariff was made while the negotiations were going on formulating the charter of ITO. This agreement was accepted as the basic framework for trade relations and come to be known as General Agreement of Tariff and Trade (GATT).

8.2 The Bretton Woods System and Its Demise

8.2.1 The Background

Before the First World War, for almost half a century (1870-1914), the international financial system was based on the classical gold standard. According to this system, each national currency had a precisely fixed gold content, and the exchange rate between any two currencies is given by the rigidly fixed ratio between the gold content of the two

currencies. For example, if gold content of pound sterling and French Franc is 0.0033 and 0.0003 ounce of gold respectively, the exchange rate between the two currencies is $.0033/.0003 = 11$, i.e., 11 franc to 1 pound. But during the First World War, when different national governments suspended the conversion of their currencies to gold, the whole system broke down. After the First World War was over in 1918, instead of returning to traditional gold standard, there was a period of flexible exchange rate regime lasting for a short while until 1926. The period, from 1918 to 1925/26, was also witnessing a rise in protectionism on a large scale after the war. There was massive hyperinflation and competitive devaluation among countries in order to maintain their competitive positions. Inability to raise taxes forced governments to use inflation as a hidden measure of tax, thus leading to hyperinflation in many countries. All these ultimately forced UK (the most powerful country of that time) to return to gold standard by 1927. But the system was no longer sustainable and England was forced to devalue its currency in 1931. Under the pressure ensuing from the Depression in the 1930s, USA's position was also weakened and eventually it was also forced to devalue in 1933. The devaluations of dollar and sterling ultimately resulted in breakdown of the gold standard and, for a few years, there was no proper internationally accepted exchange rate regime until the end of the World War II.

8.2.2 The Rise of Bretton Woods System

During the Second World War, plans for an international institution, that would monitor a new international monetary system were circulated among the Allied forces. Ultimately, after the end of the war a conference was held among 44 nations at Bretton Woods, New Hampshire in the USA in which among other things it was agreed that two new international institutions, the International Monetary Fund (IMF) and the International Bank for Reconstruction and Development (IBRD) would be created. Their functions would be to regulate the important aspect of the new economic order after the World War II. Agreement was also reached to formulate a new exchange rate system, known as the Bretton Woods System, which would help to maintain a stable exchange rate throughout the globe.

The IMF was given the role to supervise this system. Its function was not only to organize the system but also to consult with the other member countries about the exchange rate and to create an international liquidity reserve for its members.

The Bretton Woods System

The Bretton Woods system was somewhat similar to the limping gold exchange standard regime but with a little modification. According to the regime, each country

declared a par value or parity of its own currency in terms of gold. However, the only currency that could be converted to gold was dollar. The rate for conversion, which prevailed during the period was-\$35 per ounce of gold. This status made US dollar the key currency. The non-US currencies could be converted through US dollars. The system came to be qualified as gold exchange standard. Further, the convertibility of dollar into gold was restricted only to the requests from the central banks. The central banks of the member countries were asked to maintain the required parity in the foreign exchange market by buying and selling foreign exchange. Further, a variation of 1% above and below parity of the original exchange rate was allowed to give slight flexibility to the system.

But there was also certain modification later added to the system. In case any fundamental disequilibrium was faced by the member countries in its balance of payments situation, the country was allowed to revise its exchange rate up to 10% within a year of the initial selection of the exchange rate.

Thus, this obligation to maintain the declared parity, together with the possibility of changing it gave the system the name ‘adjustable-peg’. The idea behind the system was actually to establish an exchange rate regime which would be a modification of the rigidly fixed and flexible exchange rate regime. But the fact that parity has to be defended at all costs except under unavoidable situation made the exchange rate more biased towards the fixed exchange rate regime.

The responsibility to defend the declared parity was entrusted with the central banks of the member countries. They could maintain it by constantly intervening in the foreign exchange markets. Any excess demand of foreign exchange, which would devalue the exchange rate from its declared parity, should be checked by the central bank by supplying the required amount of foreign exchange and simultaneously any excess supply of foreign exchange should be purchased by the central bank to maintain the required parity. But the sole dependence on the US dollar as the only currency convertible to gold, was a severe drawback of the system and it ultimately led to its downfall.

8.2.3 The Demise of the Bretton Woods System

The Bretton Woods system at the very beginning was criticized by Keynes due to its sole dependence on the US dollar for international liquidity. All the countries at that time had to keep huge dollar reserves in order to participate in the world trade. Keynes suggested an international system based on a new currency unit called the “Bancor”. But his idea was rejected at the time and it was not until 1960 that the inevitable collapse of

the Bretton Woods arrangement was recognized by economist, Robert Tiffin, on the lines suggested by Keynes.

According to the Tiffin Paradox, a growth in the world trade can only be financed by increase in US dollar reserve holdings in the countries involved in trade. Hence to keep the volume of world trade growing the balance of payments in the USA must continuously run in a deficit, as these deficits are the means, via which other countries acquire dollars. Thus, rather than converting dollar into gold, most of the countries were keeping its reserves to facilitate trade. But the problem, in this system, was that, if the dollar liability of the USA [due to deficit] continued to increase in respect of its holding of gold, then other countries would slowly lose their belief in the credibility of US to convert dollar into gold at the fixed rate [35 per ounce]. This was what actually happened in the late '60s.

France in 1962, began to exchange dollar for gold. France was not only doubtful about the future value of dollars but was also objecting to the seigniorage gains [profit from printing money] which the USA was accumulating by printing dollars. This increased conversion of dollars to gold eventually created doubts in the minds of other countries about USA's potential gold reserves to support the US dollars.

The situation was further worsened when the USA was forced to increase its deficits to meet the expenses of the Vietnam War. The increases in deficits were mainly due to increase in inflation within the country. But this caused trade surpluses elsewhere mainly in the domestic economics of the US trading partners and to maintain their exchange rates fixed, foreign governments had to purchase the excess reserves thus increasing money supply in the domestic circuit and hence inflation in their respective countries. This increase in dollar reserves among the countries further raised doubts about the US credibility to repay dollar for gold.

Ultimately under pressure from huge BoP deficits, USA suspended gold convertibility into dollars on August 15, 1971, and a 10 per cent surcharge was placed on US imports. Many currencies were allowed to float against dollar, and by the end of 1971, most of them had appreciated. Unable to bear the cost of being a reserve currency country, USA finally called for a meeting with the 10 largest countries of the world at the Smithsonian Institution at Washington, DC at the Smithsonian Agreement, US raised the price of dollars from \$35 per ounce of gold to \$38 per ounce of gold. But even after its devaluation, dollar was under heavy selling pressure. Therefore, in 1973 it was again devalued to \$42.22 per ounce. But this removed all confidence from US dollar, and by the next month all major currencies were floating. This eventually marked the end of the Bretton Woods system.

8.3 The International Monetary Fund

8.3.1 Background

As stated earlier, the International Monetary Fund (IMF) was set up at the Bretton Woods Agreement in 1944. The chaos prevailing during the interwar period led the industrialised countries of the world to set up multilateral financial institution to monitor the international monetary system after the end of world war II. The IMF was entrusted mainly with the short run BoP adjustments of the member countries.

At the time when IMF was established in 1944, its membership was limited to 44 countries. But over time it increased continuously and in 1995 the total number was 181.

8.3.2 Purpose and Objectives of the IMF

The main objectives of the IMF were listed in the Article 1 of its Articles of Agreement.

These are listed below :

- 1) To promote international monetary cooperation through a permanent institution.
- 2) To facilitate the expansion and balanced growth of international trade and to contribute thereby to the promotion and maintenance of high level of employment in member countries.
- 3) To promote exchange rate stability, to maintain orderly exchange arrangements among members and to avoid competitive exchange rate depreciations.
- 4) To assist in the establishment of multilateral system of payments in respect of current transactions between members and in elimination of foreign exchange restrictions.
- 5) To give confidence to members by making the Fund resource available to them under safeguards, thus providing them with the opportunity to correct their BoP disequilibrium.

Apart from these objectives, the gold exchange rate, also called the Bretton Woods System, was deemed desirable with a band of 1% below and above parity. As we have discussed before, any proposed change of more than 10% on the exchange rate under the

system would require the Fund's prior permission. Apart from maintaining stability another aspect of the Fund's activity was to provide liquidity. Each member of the Fund has some borrowing rights according to their quota, to be used to meet their temporary external deficit.

8.3.3 Organization and Functioning of the Fund

The Structure of the Fund :

The management of IMF is controlled by a Board of Governors (which is the highest body), the Executive Board and an international staff. Every member country sends a representative to the "Board of Governors", which must meet once in a year. Most of the decisions on fundamental matters are taken by this board during the meeting (like electing new members or changing quotas). The day-to-day management activities are run by an Executive Board which consists of 24 Executive Directors. Among them five directors are appointed by the countries having largest quotas [namely, USA, UK, Germany, Japan and France]. The remaining are elected by the members divided into regional voting groups. The Managing Director of the Fund is a non-voting Chairman of the Executive Board, who is elected for a period of five years.

Each IMF member is allotted a quota, which determines their rights and obligations. The quotas for each country determine the subscriptions made by each of them at the Fund. The size of the quotas roughly reflects importance of the each member in the world economy. These quotas can be revised every five years by a general agreement. The quota is, therefore, a very important aspect for the IMF functioning. A member country's quota has four important aspects :

- i. It specifies a member country's subscription to the Fund;
- ii. It defines a country's drawing rights, i.e. how much a country can borrow from the Fund;
- iii. It indicates the country's voting power and
- iv. It determines its share of any allocation of SDR reserves (Special Drawing Rights, a new form of international reserves), among participants in the Special Drawing Accounts.

The quotas of each country are calculated by the formula known as the Bretton Woods formula. The formula focuses in the following variables while calculating the quota-size and fluctuations of a country's foreign trade and its export dependence, gold and foreign exchange reserves and sometimes its national income, current account transactions etc. For most decisions in the Fund a straight forward majority is sufficient with voting rights

of each member country being determined by their quotas. In general, each member country has 250 basic votes plus one vote for each 100,000 SDR of its quotas. USA, which has the highest quota, has control over almost 18% of the votes.

Size of the Fund equals the sum of the subscriptions by its members, which was estimated to be equal to SDR 145 billion in 1995. The IMF's resource mainly comes from capital subscriptions by its member countries. The subscription up to 25% must be made in gold (or later in SDR), and the remaining 75% in the country's own currency. Apart from this, the Fund can also acquire currencies for lending via sale of gold to members and by borrowing. Between 1974 and 1990, the IMF borrowed from industrialized and oil-exporting countries totaling SDR 30 billion.

8.3.4 Provisions and Pattern of Lending in the Fund

According to the Articles of Agreement, the Fund may give necessary assistance to its member countries to finance their BoP deficits on current account. Obviously, the assistance will be in the form of loans. When a country is in demand for foreign currency, it has to purchase the required amount from the Fund in exchange of equivalent amount of its domestic currency. In technical terms, this is called "drawing" on the Fund. The total amount that a country is entitled to 'draw' is determined by the amount of its quota. There are certain rules that the IMF follows for providing loans. A member is entitled to draw an amount not exceeding 25 per cent of its quota. The first 25 per cent of its borrowing, or the first part of its drawing rights, also called the gold tranche or reserve tranche, can easily be drawn by the member countries, as it is regarded as the members' owned reserves, and therefore no conditions are attached on it. Apart from this, there are four other credit tranches or drawing rights, called the first, second, third and fourth credit tranches which can be used by a country for further borrowing. But the IMF has the right to impose conditions, if a country uses these tranches. These conditions become more and more stringent as a country moves beyond first tranche. However, the Fund does not charge any interest rate for the first credit tranche. Normally, repayment period of a country, fixed by the IMF is three to five years, and at most, the maximum amount that can be borrowed by a country is 450 per cent of its quota. Of course, the rate of interest goes on increasing, as a country uses its drawing right beyond the gold tranche.

Regarding the lending pattern of the IMF, it can be said that at the beginning, rich industrial market oriented economies drew substantial resources from the IMF. However, from the 1980, the Fund lending became more directed towards developing countries of Asia and Africa. After the severe debt crisis in 80's, the Latin American countries also

became major users of the Fund resources. Another major aspect of the Funds lending is the introduction of Structural Adjustment Facility (SAF) during 1986. SAF was introduced in order to benefit the low income member countries suffering from severe debt crisis. Under the SAF, credit was made available at much flexible terms for poor members. Credit facilities for economic reforms programmes were made available at an interest rate of only 0.5% (compared to the general rate of 6%) and repayment period was increased to 10 years with a grace period of five and half years.

8.3.5 Convertibility of the IMF credit facilities

In providing financial support to any member country, the IMF must be assured that the member is pursuing suitable policies that will help to eliminate its external payment problem and make it enable to pay its debts. Use of IMF resources must be made in accordance with the provision of the IMF articles and the policies adopted under them. Therefore, as a part of conditionality, the IMF resources should be used accordingly to the guidance or frameworks provided by the IMF, so that the member country could restore its BoP equilibrium and sustain economic growth, without resorting to restriction on trade and current account payments.

Conditionalities imposed by the IMF are of varying degrees depending upon the different credit tranches. Drawings on gold or reserve tranche are unconditional. Under first credit tranche the member country is not required to satisfy any performance criterion. However, for the next three credit tranches drawings are conditional upon the agreement of the member country to follow structural adjustment and stabilization programmes in their domestic economies. These programmes normally include a mixture of monetary and fiscal policies, along with various policies which focus on exchange rate devaluation, liberalization and privatization and towards market determined economic order, where government participation is minimum. Since the budget deficit is considered as a major concern, therefore, various direct fiscal measures are recommended for reducing such deficit under the fiscal stabilization programmes. Ultimately, the conditionalities generally focus on removal of various rigidities and barriers in the working of a market based economy, so that borrower country follows the principle of 'laissez-faire', which according to the IMF, will help the borrowing country to attain sustained economic growth and development.

8.3.6 Functions of the IMF

The main objectives with which the IMF was created, were to restrict competing devaluation and to create international resources to help its members come out of

temporary balance of payments crisis. In accordance with this objective, the following functions are, in general, performed by the IMF :

1. It provides mechanism for improving short term balance of payments situation :

One of the major aims of the IMF was to overcome the balance of payments crisis among its member countries. In order to fulfil the objective, the IMF allowed short term flows of its resources to the member countries suffering from such crisis on conditional terms.

2. It serves as short term credit institution :

If any member country is in a temporary difficulty in liquidating an adverse balance of payments situation, then the Fund may come to its rescue by providing short term credit supplies. But this does not mean that the Fund would supply all the foreign exchanges that a country may need. In fact, it only acts as a second line of defence to fight against an emergency situation. Further, the borrowing country has to pay its interest and return the amount in time in order to keep its quota intact.

3. To maintain exchange stability :

One of the major outcomes of the Bretton Woods Agreement was the Bretton Woods system or the “adjustable-peg” exchange rate system. The responsibility of maintaining the overall stability in this system was imposed on the IMF. Under the system any drastic change in the exchange rate by its member countries was not possible without the prior permission of the IMF. In fact, as discussed in the previous section, any change in the exchange rate above 10% of its original value would require IMF’s prior permission except under situation when the countries’ balance of payments situation was really critical. Thus, the IMF was responsible for maintaining a relatively stable economic order at least till 1970s.

4. Reservoir of Currencies :

The Fund also provides a reservoir of currencies and enables members to borrow another member’s currency.

5. As a machinery for institutional consultation :

The IMF brings together representatives of the principal nations of the world and provides an excellent opportunity for reconciling their conflicting claims. Thus the Fund has provided a platform for international cooperation.

8.3.7 Critical Evaluation of the IMF

The Fund can play a vital role in achieving economic stability and in promoting healthy international monetary relations among the nations. However, the IMF has not succeeded

to achieve its objective fully in the early years of its operations. Some of the major shortcomings which have been pointed out by its critics, are as follows :

Firstly, for many years, the Fund was not able to achieve its fundamental objective of pulling down trade barriers.

Secondly, it has not been successful in restoring inflationary pressure in countries and maintaining monetary stability.

Thirdly, it has failed to establish a stable exchange rate for the free flow of trade in the international market.

But the major criticism of the IMF has actually come from the Third World countries due to the stringent conditionalities which were imposed on them along with the supply of Fund resources. In fact, the ideological bias of these conditionalities towards free market economy further raised doubts about the IMF's actual motives, which was supposedly and significantly influenced by the developed countries. Excessive power of the USA [having the largest quota and almost 18% voting rights] in controlling the functioning of the IMF was another criticism against functioning of the IMF.

But in spite of all these shortcomings, the IMF has successfully achieved its goals in certain fronts.

- 1) It has provided an excellent forum for solving conflicting issues in the international scenario.
- 2) It has promoted, to a certain extent, the expansion of international trade for mutual benefits of countries.
- 3) It has simplified the exchange rate system by promoting steady programme towards the establishment of a multilateral system of payments in respect of current transactions.

8.3.8 Special Drawing Rights [SDR]

Creation of SDR can best be linked with the problem of international liquidity. The term international liquidity covers all those financial assets, which can be used, to overcome any balance of payments crisis and via which a government can intervene in the forex market. During the period of Bretton Woods System, the reserve position of a country was determined by its holding of gold and foreign exchange. But gold which is a scarce natural resource, cannot be expanded when it was required for. As regards to foreign exchange, most of it was held in dollars (as it was the only currency that could be converted to gold). But the huge trade deficits on the USA in order to sustain the growth in world trade, was

making dollar less reliable as a means of foreign exchange. Thus, to avoid any shortage in international liquidity either the USA would have to run deficits which would undermine confidence on dollar, or the cessations of the US deficits to strengthen dollars would create liquidity shortage.

Thus faced with this dilemma, an agreement was made at Rio-de-Janeiro in 1967 at the IMF general meeting, to create a new form of international reserve asset unrelated to any particular currency. In 1968, SDR, as a new form of international reserve asset, was authorized to be created under the first amendment to the Articles of Agreement of the IMF.

The value of SDR was initially fixed in terms of gold with 1 dollar equal to 1 SDR till 1970. But with successive devaluation of dollar, SDR was approximately valued at 1.20 dollars. But in 1974, it was transformed into weighted average of a basket of 17 countries, and finally in 1981 its composition was reduced to a basket of 5 countries : US dollar (42%), Deutsche mark (19%), Japanese Yen (13%), French Franc (13%) and British Pound (13%).

One important feature of SDR is that it is created as an accounting entry in books of IMF, just as a normal account is created in a bank, except for the fact that in this case no deposits are required for its creation. The allocation of SDRs to each member's country is made according to the country's ratification in the IMF. After the allocation of SDR is made, a member country automatically receives its share corresponding to its quota. This allocation is made annually by a collective decision of the IMF participating members. Possession of SDR by a country enables it to obtain a definite amount of other countries' currencies, so that it can be used to correct its debt obligations. Apart from this a country can hold SDR in order to

- (i) repay old debts with the IMF,
- (ii) to acquire foreign exchange to cover deficits and
- (iii) to repurchase its own currency from other countries.

A country that uses part of its SDR allotment becomes a debtor at the IMF and thus, must pay interest on the difference between its original allocation and its present one. Similarly, a creditor country will receive interests on its surplus holding of SDR.

Unlike gold, SDR creations do not induce utilization of any scarce resources, nor does it require any deficit to sustain its circulation. Further advantage of SDR is that it is costless to produce and cannot be demonetized. Thus SDR can be used as an effective reserve currency and can be used to solve the liquidity problem in the long run.

8.4 The World Bank

8.4.1 Background

At the Bretton Woods Conference, along with the IMF, the International Bank for Reconstruction and Development (IBRD) was also established in 1944. This is also known as the World Bank. While the IMF was given the task to look after the balance of payments adjustment within the member countries, the World Bank was given the task to provide aid and support to rebuild the war-devastated Europe. With the advent of the US Marshall Plan, which acted as the main locomotive of the European re-construction, the World Bank shifted its focus towards the developing countries of the world. By 1949, it launched itself as the multilateral development bank, and since then the IBRD came to be known as the World Bank. According to the charter of the Bank, the headquarter of the Bank should be located in the country which will be holding the highest number of shares. Thus, the headquarter of the World Bank is located at Washington D. C. as the USA holds the maximum number of shares of the Bank.

8.4.2 Objectives and Policies of the Bank

The main objective of the Bank was to support the European nations to rebuild their economies from the ruins of the Second World War. But soon after, the Bank realized that the reconstruction activity was controlled more by the US-Marshall plan and thus shifted its objective towards the development of less developed countries. It provides long term development loan to the LDCs.

In the first twenty years of its establishment, two third of the Bank's loans to the developing countries was directed towards building up of large scale infrastructural projects such as electricity and transport. The Bank's main policy at that time was to promote expansion of production via improvement in the infrastructural base of the member countries, leading to economic growth in these countries. The dominant philosophy at that time was that economic growth would automatically take care of poverty. But, soon after it was realized that large projects, though were enhancing growth but failed to reduce poverty in the LDCs because of various bottlenecks present within these countries which prevented downward percolation of the benefits of the growth. Thus, the World Bank, changed its policy during the chairmanship of Robert McNamara and it emphasized on taking direct measures to reduce poverty. Consequently, projects on rural developments,

poverty eradication and agriculture became the largest recipients of the World Bank loans. Above all, priority was given to development of the education level, health, birth control in the poorer LDCs. Later, with the introduction of SAL/SAP, another change in policy of the World Bank was noticed. Loans were disbursed in exchange of policy reform, such as liberalization, privatization of public sector, financial sector reform, labour market reforms etc. By the late '90s the policy of the Bank has been focused towards development of the market-oriented economics in the LDCs, with government interventions being permitted only in the backward/less developed areas in those countries. More recently, the Bank has focused on NGOs for developing the less developed areas of LDC and for implementing various poverty eradication programmes, literacy projects, health and birth control related programmes etc.

8.4.3 The Organization and Structure of the Bank

Being sister institution of the IMF, membership of the IMF is a prerequisite for membership of the World Bank. The organizational structure of the Bank was quite similar to that of the IMF. At the head of the institution, all the powers were vested to the Board of Governors, which consisted of one representative from each member country. The Board generally meets once in a year to take any important decision, jointly with the Fund's Board of Governors.

But the daily effective management is controlled by the Board of Executive Directors, which consists of 24 members. The five countries, which hold the largest shares in the Bank, have five permanent appointed Executive Directors and the rest are elected by the governors representing other member countries. Voting rights are same for all the members. The Chairman of the Board of Executive is appointed for a period of five years. He also acts as the chief of the World Bank's operating staff.

The officers and staff of the World Bank is divided into six regional groups along with various other administrative sectors. Each country group is led by the Bank Vice President. In addition there are nine operational sections.

8.4.4 Lending Policies of the Bank

The World Bank grants loans to the developing countries almost nearly to an amount of \$20 billion a year. Generally, the duration of loans is for a period of 15 to 20 years as against the IMF loan of 5 to 6 years. But the lending rate for the World Bank is higher than that of the IMF lending rate since the Bank loans are long terms loans.

Before granting a loan to a member country, the World Bank is generally guided by the following principles :

- I. It verifies the particular country's debt servicing capacity.
- II. Loans are given only for productive purpose and entirely on economic considerations.
- III. The loans are granted only when the country seeking financial assistance cannot raise capital on reasonable terms from any other source.
- IV. The Bank normally gives loan to cover only foreign exchange component of the project.

Normally there are three provisions for distributing loans :

Project Loans :

This is the most traditional way of allocating loans to the developing countries. It has been estimated that over 50 years (1944-96) the loans provided by the World Bank is almost equal to \$ 250 billion distributed over 3500 projects.

Sectoral Loans :

These loans are generally sector specific non-project oriented loans, meant to help the developing countries. Most of the part of the loans in this category is directed to support a policy change while the rest may be used to meet the cost of sector specific projects.

Structural Adjustment Loans :

A loan under this category requires the borrowing country to make policy reforms which will alter its production structure. The World Bank loans in this category are designed to support :

- I. Market oriented principles in order to promote competition and flexibility in every spheres of economic activity.
- II. Privatization.
- III. Liberalization relating to industry and trade.
- IV. International Reforms.

8.4.5 Functions of the World Bank

IBRD was set up in 1944 with the objective to provide long term capital to its member nations in an orderly manner to accomplish long term developments in these countries. Its main functions which are generally attached with its objectives, are as follows :

- (i) It provides financial and technical assistance to developing countries for their development projects.

- (ii) It promotes international flows of private investments from capital surplus countries to capital deficit countries, thus providing an outlet for surplus resources of capital abundant countries and helping to raise investment level in capital deficit countries.
- (iii) It aims to sustain balanced growth of international trade that will improve welfare of the people throughout the world.
- (iv) It serves as guarantor, thereby attracting private foreign investments towards the LDCs and hence stimulating foreign investment in those countries.

Countries suffering from acute balance of payments crisis, can get structural loans from the Bank on easy instalments but generally these loans are accompanied with stringent conditionalities based upon various market-oriented policies which must be followed by the borrowing country.

8.4.6 Affiliates of the World Bank

The World Bank has two financial affiliates : one is the International Development Agency (IDA) and the other is the International Finance Corporations (IFC). Both of these are separate legal entities of the World Bank.

● The International Development Agency (IDA)

IDA was set up in 1960 with the aim of providing easy and commercial loans to the Less Developed Countries for their development purpose. The creation of IDA highlighted three important facts :

- (i) It is a step to institutionalize commercial finance for development purposes.
- (ii) It has made poverty and backwardness of the Less Developed Countries as a matter of concern for the developed countries.
- (iii) By improving the economic capabilities of the LDCs it tries to enhance the multilateral trade and payments throughout the world.

Membership of the World Bank is a prerequisite for the membership of the IDA. It is usually referred as the soft loan window of the World Bank due to the commercial and easy loans it provides to the LDCs. These loans are mainly aimed at reducing the burden of the borrowing to stabilize balance of payments position of the poor member nations.

● The International Finance Corporation (IFC)

The IFC was set up in 1956 with the aim of supplementing the activities of the World Bank. The membership of the World Bank is a prerequisite for the membership of the IFC.

It assists financially the private productive enterprises in the LDCs. This role of the IFC is supposed to induce foreign fund flow to the LDCs. It provides assistance to the LDCs. It provides assistance to the private enterprises in three different ways :

- (i) by direct investments;
- (ii) by obtaining additional foreign and domestic capital and
- (iii) by providing technical assistance.

It sometimes also invests in the private enterprises where the public sector has joint holdings.

8.5 General Agreement on Tariff and Trade (GATT)

Although economic theory suggests that countries should pursue liberal trade policies and exchange goods and services on the basis of their comparative advantage, in practice most nations actively intervene in international trade. Since 1947 the GATT has played a major role in constraining trade policies, in the process creating an even more complex network of rights and obligations regulating international trade relations. Progress has sometimes been fitful, often involving two steps forward and one step back.

Global trade in goods and services equalled sums US \$5 trillion (thousand billion) in the early 1990s. At \$3.7 trillion, trade in goods accounted for the lion's share of global flows, followed by trade in services, which passed the \$1 million mark in 1992. Much of the trade in merchandise involved OECD countries. Trade flows involving other parts of the globe are relatively small. Trade between these other regions is generally less than 0.5 per cent of the world trade.

Although trade flows between developing country regions of the world are much smaller than those involving high-income regions, the volume and growth rate of global trade flows are important because international trade is an engine of growth. OECD markets provide developing countries with their most important export opportunities, while growth in developing countries generates imports of intermediate and capital goods as well as know-how. World trade growth has outstripped the growth of output consistently throughout most of the post-Second World War period, resulting in steadily increasing trade openness ratios for most countries (the sum of exports and imports relative to gross domestic output). In the 1985-95 period, the growth of world trade was more than twice as high as the growth of global output. This implies that the world is becoming even more integrated through trade. Rising trade openness ratios and integration, in turn, has significant

positive impacts on total factor productivity the portion of real output growth not accounted for by increasing inputs of labour and capital. This is because greater trade implies greater competition and, therefore, pressures to innovate and enhance productive efficiency, while at the same time allowing technological upgrading. By encouraging trade liberalization, non-discrimination and transparency of trade policies, the GATT supported the globalization process.

Developing countries, in particular, have experienced very large increases in trade volumes and openness to the world economy. In the 1985-95 period, they experienced real increases in trade flows that were on average 6 percentage points higher than real output growth. This performance reflected to a great extent unilateral efforts by these countries to open their economies to foreign competition. Developing countries traditionally refrained from full-fledged participation in GATT-based trade liberalization efforts. With the establishment of the WTO, however, most developing countries signalled a greater willingness to abide by the rules of the game.

The rise of creative forms of protectionism in the 1980s, such as voluntary export restraints, illustrates the difficulty of enforcing multilaterally negotiated rules. Time will tell how successful the WTO will be in maintaining and extending multilateral co-operation and preventing large countries such as the US from pursuing solutions to trade problems outside the system. The very act of creating the WTO gives some cause for optimism in this regard.

A Historical Overview : From GATT to WTO

Formally, the GATT was not an international organization (i.e. a legal entity in its own right), but an inter-governmental treaty. As a result, instead of member states, GATT had 'contracting parties'. The agreement reached at the end of the Uruguay round (April 1994) to establish the WTO changed matters. The WTO is an international organization that administers multilateral agreements pertaining to trade in goods (GATT), trade in services (GATS) and trade related aspects of intellectual property rights (TRIPs).

The GATT emerged from the negotiations to create an International Trade Organization after World War II. The negotiations on the charter of such an organization, although concluded successfully in Havana in 1948, did not lead to the establishment of the ITO because the US Congress refused to ratify the agreement. The GATT had been negotiated in 1947, before the ITO negotiations were concluded. As the countries involved in the 1947 exchange of tariff reductions were anxious that their implementation not be conditional upon the conclusion of the ITO talks, the GATT was created as an interim agreement. As the ITO never came into being, the GATT was the only concrete result of the negotiations.

Although the GATT incorporated many of the specific provisions of the ITO, having been conceived as a temporary trade agreement it lacked an institutional structure. In the first years of its operation, it did not exist as an entity except one or twice a year when formal meetings of the contracting parties were held. Its organizational structure emerged only gradually.

Eight rounds of multilateral trade negotiations have been held under the GATT auspices : the Geneva round (1947), the Annecy round (1949), the Torquay round (1951), another Geneva round in 1956, the Dillon round (1960-1), the Kennedy round (1964-7), the Tokyo round (1973-9) and most recently the Uruguay round (1986-94). The first five rounds dealt exclusively with tariffs. Starting with the Kennedy round, attention began to shift towards non-tariff trade restrictions and to the problem of trade in agricultural products. Although the Kennedy round dealt only with non-tariff barriers (NTBs) that were already covered by the GATT, the Tokyo round addressed policies that were not subject to GATT disciplines (the foremost examples being product standards and government procurement). This trend was continued in the Uruguay round which included trade in services, intellectual property and rules of origin all matters on which the GATT had very little to say.

Why trade liberalization?

The central concept underlying trade is opportunity cost. Producing (consuming) something comes at the cost of not producing (consuming) something else. An important economic theorem based on the concept of opportunity cost states that there are gains from trade associated with specialization. That is, aggregate production and consumption of a group of people, a group of countries, or the world as a whole can be larger if the people or countries concerned specialize in the production of goods and services in which they have a comparative advantage and are permitted to freely exchange their products for those of other people or countries. It is largely due to such specialization and international trade that, on average, the level of consumption (real incomes) has increased by about four times over the last eight decades.

Consider a simple example. If the people of region A, who are good at raising animals (say cows), must also spend time growing food (at which they are less good than in raising cows), they will be able to keep fewer cows. Each hour spent growing food has a high opportunity cost in terms of cows foregone. Suppose the people of region B are good at farming, but do not have much aptitude for raising cows. B will then have a high opportunity cost in terms of time not spent farming. If these two countries or groups of people could trade with each other, they could concentrate on what each does best. Economists say that

they would specialize according to their comparative advantage. This will ensure that total output produced is maximized and that each party ends up being able to consume more vegetables and cows that would be possible otherwise.

The decision what to specialize in depends on what one does best compared with the other things that could (or would have to) be done. The people of A might actually be better farmers than those of B, in that for every hour invested in farming they get a bigger harvest than B does. However, as long as an hour spent by the people in A on farming has a higher cost in terms of foregone cows than does an hour spent on farming in B, A should specialize in cows. What matters is not absolute, but comparative advantage. International trade provides nations with the opportunity to specialize in production according to their comparative advantage. Trade liberalization which is a major objective of the GATT, thus helps nations to realize a more efficient utilization of their resources (production capacities). Trade liberalization has two essential effects. First, it brings about a reallocation of resources towards those activities in which the country has comparative advantage. Secondly, trade liberalization expands the consumption opportunities of countries, as more efficient production generates greater income and increased opportunities to buy goods and services from other countries. No matter how poorly endowed a country is, it will always have a comparative advantage in something.

This suggests that countries interested in maximizing their wealth should not impose trade barriers. This is certainly the case for small countries which are price-takers on world markets. However, as explained at greater length below, there are often political difficulties in liberalizing access to markets. In part this is because some people will always lose. While these can be compensated in principle, in practice this is not always easy. It is also the case that even though a country will benefit from liberalizing its trade, it is even better that trading partners do the same. This is one of the rationales for engaging in multilateral liberalization attempts. Large countries can benefit from trade restrictions if they have the power to affect world prices (an import barrier by reducing demand can lead to a fall in world prices). A problem is that if all countries follow this policy, all will end up being worse off than if free trade was pursued. Another problem is that if tariffs are not set at the optimal level, the country may lose even if other countries pursue free trade. Large countries, therefore, will usually also benefit from the reciprocal reduction of trade barriers.

Maintaining or achieving a liberal trade policy is no trivial matter. In most countries numerous groups will exist that have different preferences with respect to trade measures.

The structure of protection at any point in time is the result of the interaction between the demand expressed by various interest groups and the supply offered by governments. Attempts to alter this equilibrium i.e. to move towards a welfare-increasing reduction in protection, will result in opposition by those groups that expect to lose from liberalization. The losses associated with liberalization are usually concentrated on import-competing industries, while the gainers tend to be much more diffuse : the consumers of the product. A political economy problem therefore, arises. Those facing large losses have a much greater individual incentive to organize and invest in lobbying against liberalization than those that gain from liberalization, as individual gains are relatively small and dispersed among a large number of issues. This, indeed, is the main reason why trade restrictions are imposed in first place. An MTN can solve this problem by confronting the losers with another lobby that may be equally powerful : the set of firms that gain from greater access to foreign markets. Similarly, by requiring reciprocal reductions in trade barriers, the prisoners' dilemma that may, in principle, confront large countries can be overcome, again improving world welfare. Finally, by including many products in the negotiation, losers obtain some automatic compensation through access to cheaper imports.

An MTN is a market in the sense that countries come together to exchange market-access commitments on a reciprocal basis. It is a barter market. In contrast to the markets one finds in city squares, countries do not have access to a medium of exchange : they do not have money with which to buy and against which to sell trade policies. Instead they have to exchange apples against oranges : tariff reductions for iron against foreign-market access commitments for cloth. This makes the trade-policy market less efficient than one where money can be used and is one of the reasons that MTNs can be a tortuous process.

8.6 The World Trade Organization (WTO)

Multilateral co-operation among sovereign nations occurs through the creation of institutions or regimes, World Trade Organization (WTO) can be regarded as the major building-block of the multilateral trade regime.

The role of the WTO can be explained with reference to two different perspectives. The first is to regard the institution as a code of conduct for multilateral trade and the second is to view it as a market. The WTO is a market. Trade negotiations are conducted to reduce tariff and non-tariff barriers to trade and to formulate rules and to resolve disputes. They can be regarded as market through which nations attempt to create and alter rules governing the trade policies of Members, and engage in the reciprocal exchange of liberalization commitments. The WTO is entrusted with achieving trade agreements and enforcing them among the Member nations.

One of the results of the market exchange is a code of conduct. The WTO contains a set of specific legal obligations regulating the trade policies of the Member States. These are embodied in the GATT, the GATS and the agreement on TRIPs and are intended to help attain the objective of the founders of the GATT-1947 : enhancement of economic growth via non-discrimination and progressive liberalization of trade. The rules and principles of the WTO constrain the freedom of governments to use specific trade-policy instruments. They influence the balance between interest-groups seeking protection and those favouring open markets in Member countries' domestic political market place. The foreign trade policy-making process is generally torn by conflicting objectives of national interest groups, as well as by external considerations. Industry associations, labour unions, regional authorities, consumer lobbies and government agencies all interact in determining the policy outcome.

The WTO embodies a rule-oriented approach to multilateral Co-operation. This contrasts with what can be characterized as a results-oriented approach-agreements on trade flows, market share or international prices. The tension between rule-based and outcomes-oriented approaches to international co-operation on trade policy has been a prevailing theme in much of the post-Second World War period. Examples of managed trade include arrangements that involve negotiated agreements on the volume of trade (e.g. barter deals; 'voluntary' agreements to import specific quantities; quotas) and those that attempt to stabilize or set prices (the OPEC cartel being a prominent example). Rule-oriented approaches focus not on outcomes, but on the rules of the game, and involve agreements on the level of trade barriers that are permitted as well as attempts to establish the general conditions of competition facing foreign producers in export markets.

Four basic principles can be identified that are of particular importance in understanding the WTO : (1) non-discrimination; (2) reciprocity; (3) market access and (4) fair competition. These principles are not always consistent with-or complementary to each other. There is a tension between non-discrimination and reciprocity on the one hand and between market access and the notion of fair competition on the other. Of these four principles, non-discrimination is a basic and fundamental formal rule. Reciprocity, in contrast, is a mechanism or tool that is used in multilateral trade negotiations (MTNs) to achieve liberalization and agree on further elaborations of the multilateral code of conduct. Market access and fair competition are best seen as objectives that are pursued through the enforcement and implementation of the non-discrimination principle and other reciprocally negotiated rules of behaviour. Transparency and notification requirements play an important role in this connection.

Non-Discrimination

The principle of non-discrimination has two dimensions. The Most Favoured Nation (MFN) rule requires that at the border, products made in Members' own countries are treated no less favourably than goods originating from any other country. Thus, if the best treatment offered to a trading partner supplying a specific product is a tariff of, say, 5 percent, then this rate must be applied immediately and unconditionally to the imports of this good originating in all WTO members. Because the initial set of contracting parties to the GATT was quite small (only twenty-three countries), the bench-mark for MFN is the best treatment offered to any country, including countries that may not be members of the GATT. A similar wording applies under the GATS.

The MFN obligation is complemented by the national treatment rule. This requires that foreign goods, once they have satisfied whatever border measures are applied, including the payment of customs duties and/or other charges-be treated no less favourably in terms of taxes and measures with equivalent effect than domestic goods. That is, goods of foreign origin circulating in the country should be subject to the same taxes, charges and regulations that apply to identical goods of domestic origin. It is important to note that the obligation is to provide treatment 'no less favourable'. A government is free to discriminate in favour of foreign products (against domestic goods) if it desires subject, of course, to the MFN rule-all foreign products must be given the same treatment. 'No less favourable' does not mean identical treatment, as in many instances it is simply not possible to subject domestic and foreign goods to the same policy. For example, if in practice domestic production is taxed, a government cannot impose the same tax on foreign producers. It is restricted to taxing the foreign products that enter the country. What matters is equivalence.

MFN applies unconditionally, the only major exception being if a sub-set of Members form a free-trade area or a customs union or grant preferential access to developing countries. MFN is one of the pillars of the GATT. Non-discrimination across foreign sources of supply is important for a number of reasons. The first is economic efficiency. Although trade barriers are inefficient instruments, if policy does not discriminate between foreign suppliers, importers and consumers will continue to have an incentive to use the lowest-cost foreign supplier. The second is to provide smaller countries with a guarantee that larger countries will not exploit their market power by raising tariffs against them in periods when times are bad and domestic industries are clamouring for protection, or alternatively, to give specific countries preferential treatment, perhaps for foreign-policy

reasons. MFN helps enforce GATT rules by raising the costs to a country of defecting from the trade regime to which it committed itself in an earlier MFN. If it desires to raise trade barriers it must apply the changed regime to all WTO Members, which may then be able to claim compensation.

National treatment also applies unconditionally in GATT. Its role is to ensure that market-access commitments (trade liberalization) are not offset by countries through the imposition of domestic taxes and similar measures. By requiring that foreign products be treated no less favourably than identical domestic products, it becomes much more difficult for a contracting party to prevent foreign products from competing with domestic ones. The effect is to give foreign suppliers and domestic buyers greater certainty regarding the regulatory environment in which they must operate. This, in turn, facilitates the organization of production, planning and so forth. The national treatment principle has often been invoked in dispute-settlement cases brought to the GATT. It is a very wide-ranging rule. The obligation applies whether or not a specific tariff commitment was made and covers taxes and non-tax policies : all policies must be applied in a non-discriminatory fashion to similar (competing) domestic and foreign products. It is also irrelevant to what extent a policy hurts an exporter; what matters is the discrimination.

Reciprocity

The agreements administered by the WTO are based on a balance of rights and obligations, achieved through the reciprocal exchange of market-access commitments. The principle of reciprocity is a fundamental element of MTNs, i.e. in the process of establishing the code of conduct and is driven by a desire to limit the scope for free-riding that may arise because of the MFN rule. Thus, trade liberalization occurs on a quid pro quo basis. Although undefined in the WTO, in practice a balanced exchange of concessions is necessary for agreement to be possible. Usually the concessions that are offered would benefit the nations involved even if implemented unilaterally. Reciprocity in trade negotiations comes in many guises. It may be expressed in quantitative or qualitative terms and may apply to levels or to changes in protection. While the GATT and the GATS arguably have as underlying goals a broad balance of market-access commitments, MTNs, in general, and tariff negotiations in particular proceed by agreeing to incremental changes in levels of protection. Convergence in the levels of protection is gradual.

By requiring reciprocity, nations attempt to minimize free-riding. In the case of bilateral negotiations, this is done by a suitable choice of products on which concessions are offered and sought, in the case of multilateral across-the board negotiations, it is done by a suitable choice of products to be exempted from liberalization. Generally, nations are quite

successful in minimizing free riding. For example, internalization as the sum of all US imports originating in countries with whom it exchanged concessions as a percentage of total imports of goods on which concessions were made, was about 90 per cent for the US in the Dillon (1960-1) and Kennedy (1964-7) rounds. There was a relationship between the sizes of concessions made on commodity tariffs and the degree of bargaining power a country had on a commodity vis-a-vis its major trading partners. Thus, reciprocity is, in part, a function of the weight a country can bring to bear in a negotiation.

Reciprocity also applies when countries accede to the club. Given that new members obtain all the benefits in terms of market access that have resulted from earlier negotiating rounds, existing members invariably demand that potential entrants pay an admission fee. In practice, this implies not only that upon joining the WTO a country's trade regime must conform as much as possible with the rules of the GATT, GATS and TRIPs, but that the government will be asked to liberalize access to its market as well. Accession, therefore, involves a negotiation process.

Reciprocity is an instrument that allows trades to be made in the MTNs. Its theoretical foundation can be found in the political economy literature. The costs of liberalization are generally concentrated in specific industries, which will often be well organized in terms of generating political opposition to a reduction in protection. Benefits, while in the aggregate usually greater than costs, accrue to a much larger group of people, who do not have a great individual incentive to organize themselves politically. In such a setting negotiators need to be able to point to reciprocal, sector-specific export gains to be able to sell the liberalization politically. By obtaining a reduction in foreign import barriers as a *quid pro quo* for a reduction in domestic trade restrictions, specific export-oriented domestic interests that will gain from liberalization have an incentive to support it in domestic political markets. A related point is that for a nation to negotiate it is necessary that the gain from doing so be greater than the gain available from unilateral liberalization. By obtaining concessions, these gains are ensured.

A major problem associated with the use of reciprocity in the process of trade negotiation is that the asymmetry in the size of countries can cause the mechanism to break down. Small nations have little to offer large ones in terms of export potential. A large player such as the EU, Japan or the USA will not consider bilateral requests by a small economy that offers to substantially liberalize access to its markets without considering the impact of acceding to such requests on its trade relations with other large traders. Various methods have been created that attempt to offset this problem. Fundamentally, however,

it is a fact of life that small economies (i.e. most developing countries) have little to bring to the negotiating table. This does not mean that participation in reciprocal negotiations is irrelevant to such countries, as signing on to GATT rules will help to lock-in liberalization. Nor does it mean that the value of liberalizing trade for such countries is significantly reduced. What it does imply is that the potential domestic political benefits of reciprocal negotiations are less and that there must be greater dependence on unilateral efforts to open domestic markets to foreign competition.

Market Access

An important goal of the founders of the GATT was the promotion of an open trading system based on rules fostering competition between suppliers located in different countries rather than on attempts to manage trade flows and determine outcomes. Reciprocal MTNs were foreseen as instruments to enhance market access, while the non-discrimination principle, as embodied in Articles I (MFN) and III (national treatment) of the GATT, was intended to help ensure that market-access commitments were implemented and maintained. Other GATT Articles play a supporting role in either facilitating the contestability of markets, or enforcing market-access commitments. Perhaps the most important of these are Articles II (on Schedules of Concessions) and XI (Elimination of Quantitative Restriction). The tariff concessions (reductions) agreed to by the GATT contracting parties in an MTN are listed in the so-called schedules (lists) of concessions. Such concessions are bound. This means that the country involved cannot raise tariffs above bound levels without negotiating compensation with affected countries. The MFN rule then ensures that such compensation usually reductions in other tariffs potentially benefits all WTO Members. Once tariff commitments are bound, other, non-tariff, measures that have the effect of 'nullifying or impairing' the value of the tariff concession may not be used. Hence, the importance of GATT Article XI prohibiting quotas (with certain exceptions) and the rules on subsidies. Quotas are prohibited not only because of transparency or efficiency considerations, but to ensure that tariff concessions are not offset by the imposition of quotas and analogous measures.

If a country perceives that actions taken by another government have the effect of nullifying or impairing a concession (that is, the market-access commitments implied by the tariff bindings and safeguarded by the various rules and disciplines of the GATT), it may bring this to the attention of the government involved and ask that the action be offset. If satisfaction is not obtained, it may invoke the WTO's dispute-settlement procedure. Because the GATT and the WTO are inter-governmental agreements, private parties do not have legal standing before the WTO's dispute-settlement body. The private sector must

go through its government. It is also worth noting that in the EU and US domestic legal orders, the GATT is not a self-executing treaty, which means that private parties cannot invoke GATT disciplines in domestic litigation either. Multilateral agreements must be translated into domestic law through implementing legislation. The existence of dispute settlement procedures gives members an incentive to raise disputes in the WTO, rather than seeking redress through unilateral retaliation. For small countries, in particular, recourse to a multilateral body will frequently be their only option, as unilateral actions will not be effective and thus not be credible. Large countries have as great a stake in the functioning of the regime, as in many instances disputes will involve other large trading nations. Moreover, for an export firm what counts is market access, independent of whether it is located in a small or large country and the WTO helps guarantee that access.

Market access is also facilitated by rules that increase the transparency of trade regimes maintained by Members. Various transparency mechanisms are incorporated into the agreements administered by the WTO. Members must publish their trade regulations; establish and maintain institutions allowing for the review of administrative decisions affecting trade; respond to requests for information by other Members; and notify subsidy practices to the WTO. Surveillance of trade policies by the WTO Members and the Secretariat also fosters transparency and reduces the scope for countries to circumvent their obligations.

Fair Competition

A final principal embodied in the WTO is 'fair competition'. This should not be confused with the economic conception of fair competition as defined in competition or anti-trust legislation. Fair competition in the GATT context is reflected in a number of provisions. Government subsidization of exports is prohibited and/or countervailable by importing countries. Certain types of behaviour pursued by exporting firms (as opposed to governments) are also countervailable. Thus, dumping by exporters which usually means charging a price in the export market that is less than what is charged in the home market may be offset by importing country governments through the imposition of an anti-dumping duty if the dumping injures domestic competitions. Governments also have the right to intervene when competition from imports becomes 'excessively' injurious to domestic industries, to safeguard the balance of payments, or to protect public health or national security. The underlying idea is generally that competition should be on the basis of a 'level playing-field', to employ an often used and abused term, and that governments should have the right to step in when competition becomes too vigorous. The objective of fair competition is often in direct conflict with that of market access, as the instrument used by governments to attain fairness is usually a trade barrier. Such barriers are, however, perfectly legal and permitted.

8.7 Let Us Sum Up

After studying this unit we have learnt about the evolution of international monetary system since 1870. Starting with the gold standard system in 1870 the international monetary system witnessed several regime : inter-war gold exchange standard system, the Bretton Woods System from 1945 to 1973 and the current floating mechanism. International monetary system refers to particular exchange rate regime and payment mechanism between the nations to settle their respective balance of payments position. Gold standard was evolved as the first standardized international monetary system across the globe in 1870. Under this system exchange rate between two countries was set in terms of the gold parity. This system collapsed with the outbreak of the First World War as the countries found it difficult to maintain gold reserve at fixed parity. The gold standard system was actually a fixed exchange rate regime. In the inter-war period, a modified gold standard system, known as gold exchange standard, was evolved which did not last very long. After the Second World War, the leading industrialized country of the world felt the urgent need for a new system. At a conference in Bretton Woods, the USA the new system was evolved which came to be known as the Bretton Woods system. It was basically a fixed exchange rate regime centered around what may be called gold exchange standard regime. Under this system the US dollar became the reserve currency. The US was to hold gold reserves and all the other country's exchange rates were fixed in terms of US dollar. The system collapsed in 1973 as it mounted heavy pressure on US to maintain gold reserves at fixed parity and also to have continuous trade deficit. Since then floating rate system is in vogue.

The Bretton Woods conference gave rise to two institutions : the International Monetary Fund (IMF) and the World Bank. The IMF's role is to look after the short terms balance of payments disequilibrium of its member countries and also, to provide these countries to meet their BoP deficits with financial assistance. The World Bank is to help the member countries with long term development loans.

The Bretton Woods conference also planned to set up an institution : International Trade Organization (ITO) with the aim of fostering liberal trade regime in a multilateral framework. It did not materialize as the US opposed the idea. In its place, a General Agreement on Tariff and Trade (GATT) came into force with a view to garner free trade by working towards removal of tariff and non tariff trade barriers. GATT was replaced by the World Trade Organization (WTO) in 1995. It is now the all empowered multilateral

trade body in the world. Its main objective is to promote trade liberalization and set up harmonious trade rules and norms in multilateral trade in goods and services, intellectual property rights, trade related investment measures etc. India is one of the active members of the WTO since its inception.

8.8 Questions

- (i) What do you mean by the gold standard system?
- (ii) Describe the Bretton Woods system.
- (iii) Why did the Bretton Woods system collapse?
- (iv) Describe the functions of the IMF.
- (v) Critically evaluate the IMF's lending policy.
- (vi) What are the functions of the World Bank?
- (vii) Make a critical assessment of the World Bank.
- (viii) Write short notes on (a) IDA and (b) IFC.
- (ix) What is GATT? Briefly discuss different rounds of GATT negotiations.
- (x) Give a brief historical account of evolution from GATT to WTO.
- (xi) Why is trade liberalization called for?
- (xii) Describe the main principles on which the WTO is based.

8.9 References

Sodersten and Reed, Geoffrey, International Economic, Third Edition Macmillan, 1994.