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M.A.ECONOMICS
(First Year)

ADVANCED MACRO ECONOMICS

(SECM31)

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Semester – III

Core – VII

ADVANCED MACRO ECONOMICS

UNIT I: Classical, Keynesian and Post Keynesian Macro Economics

Classical theory of output and employment – Full Employment equilibrium – AD – AS Model – Keynesian theory of output and employment – Under employment equilibrium – Effective Demand – Hicks Hansen IS – LM – BP Model.

UNIT II: The New Classical Macro Economics

Assumptions of Rational Expectation Hypothesis – Policy ineffectiveness theorem – Aggregate supply hypothesis – policy implications of new classical approach – source of productivity shocks in real business cycle theory – stabilisation policy and unemployment – role of money in real business cycle theory – policy implications of real business cycle theory – DAD – DAS Model.

Unit III: New Keynesian Macro Economics

Core Propositions of new Keynesian macroeconomics – wage and price rigidities – New Keynesian business cycle theory – Policy implications of new Keynesian macroeconomics.

Unit IV: Open Economy Macro Economics

Openness in goods in financial market – output interest rate and exchange rate – exchange rate regimes – exchange rate and balance of payments – Mundell Fleming Model.

Unit V: Macro Economic Policies

Stabilisation policies – Theory of policy – Tinbergen Approach – Fiscal Policy – Monetary policy – optional policy mix – Crowding Out Effect – Bond Financed and Tax Financed Government Expenditure – Rules vs Discretion – Government Budget and Budget deficit.

Text Books:

1. Dornbusch, Rudiger, Stanley Fischer (2000), Macroeconomics, Tata McGraw – Hill Publishing Company, New Delhi.
2. Roger E.A. Farmer (2002), Macroeconomics, Thompson Asia Pvt, Ltd., Singapore.

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UNIT - I

Classical, Keynesian and Post Keynesian Macro Economics

1.1. Introduction

For more than two centuries, there have been two opposing views of the capitalist economy. One stresses its virtues, and the efficiency with which prices carry information between consumers and producers, and allocate resources. The other spotlights the shortcomings of the market system, and particularly its episodes of massive unemployment of capital and labour. Adherents of the first group usually treat unemployment as a temporary aberration that market forces will cure if left to themselves. The New Classical Economists have gone further. They interpret changes in employment levels as rational agents' responses to perceived changes in relative prices: workers in 1932, for example, took more leisure because relative wages looked low. They liken unemployed capital to a spare tyre-spare capacity held for those few times when it is really needed. To the critics of capitalism, such views are dangerous, unscientific nonsense, misleading governments into acquiescing in the grave social and private costs of high unemployment. Keynes reconciled these conflicting views of capitalism. He confronted the unemployment problem, and argued that limited government intervention could solve it. Once unemployment was removed, the classical vision of the efficient market could be restored. Samuelson dubbed this the Neoclassical Synthesis. The Neoclassical Synthesis was taken as an article of faith. Fundamental questions about the failures of the market system, such as the causes of periodic depressions and the unemployment that accompanied them, were avoided. Keynesian economics created schizophrenia in the way that Economics was taught: macroeconomic courses, in which students were introduced to Adam Smith's invisible hand and the fundamental theorems of welfare economics, were followed by macroeconomic courses, focusing on the failures of the market economy and the role of government in correcting them. Two sub-disciplines developed. Micro economists criticized macroeconomists for their lack of rigour and theoretical foundations. Macroeconomists castigated micro economists for the unrealism and inappropriateness of their theories. Dissatisfaction with Keynesian economics was also based on the want of explanation for some of its central assumptions, particularly

concerning the sluggishness of prices and wages. Why did wages and prices not fall enough in recessions? Why didn't firms that wanted to sell more simply lower their prices? A quarter of a century of research failed to provide convincing answers to these questions. This state of affairs could not continue for long.

New Classical Economics took the first approach. Its advocates aimed to derive the dynamic, aggregative behaviour of the economy from the basic principles of rational, maximizing firms and individuals. The School recognized the importance of dynamics for understanding macro-behaviour, and the central role of expectations in shaping those dynamics. It focused attention, then, on the consequences of rational expectation formation, and it is this aspect of their work which has given the School its alternative name, the Rational Expectations School. The other approach seeks to adapt micro theory to macro theory. For the want of a better term, one can refer to it as the New Keynesian Economics. The phenomena of unemployment, credit rationing and business cycles are inconsistent with standard macroeconomic theory. New Keynesian Economics aims to develop a micro theory that can account for them. There are numerous different strands to New Keynesian Economics, taken in its broadest possible sense. One major element is the study of imperfect information and incomplete markets. This paper aims to present a broad outline of this aspect of the New Keynesian Economics, and to show how it resembles and differs from traditional Keynesian Economics. Keynes himself had a novel, and markedly non-neoclassical vision of how the economy worked. Keynes used picturesque language to describe the behaviour of entrepreneurs: they were moved by "animal spirits". We contend that this vision, captured so well in many of his brilliant passages, provides greater understanding of unemployment and business cycles than do the formal Keynesian models.

1.2. Classical Theory of Output and Employment

1.2.1. Introduction

John Maynard Keynes in his General Theory of Employment, Interest and Money published in 1936, made a frontal attack on the classical postulates. He developed a new economics which brought about a revolution in economic thought and policy. The General Theory was written against the background

of classical thought. By the "classicists" Keynes meant "the followers of Ricardo, those, that is to say, who adopted and perfected the theory of Ricardian economics." They included, in particular, J.S. Mill, Marshall and Pigou. Keynes repudiated traditional and orthodox economics which had been built up over a century and which dominated economic thought and policy before and during the Great Depression. Since the Keynesian Economics is based on the criticism of classical economics, it is necessary to know the latter as embodied in the theory of employment.

1.2.2. Output and Employment

The term classical refers to virtually all the economists who had written on macroeconomic questions before 1936. To classical economists, the equilibrium level of income at any time was a point of full employment or a point when actual output was equal to potential output. Two features of the classical analysis are:

1. Classical economics stressed the role of real as opposed to monetary factors in determining real variables such as output and employment, Money has a role in economy only as a means of exchange.
2. Classical economics stressed the self-adjusting tendencies of the economy. Government policies to ensure an adequate demand for output were considered by classical economists to be unnecessary and generally harmful.

The determination of output and employment in the classical theory occurs in labour, goods and money markets in the economy. The classical theory assumes over the long period the existence of full employment without inflation. Given wage-price flexibility, there are automatic competitive forces in the economic system that tend to maintain full employment, and make the economy produce output at that level in the long run. Thus, full employment is regarded as a normal situation and any deviation from this level is something abnormal since competition automatically pushes the economy toward full employment.

The classical theory of income, output and employment is based on the following assumptions:

1. There is a normal situation of full employment without inflation.
2. There is a laissez faire capitalist economy without foreign trade.
3. There is perfect competition in labour, money and product markets.

4. Labour is homogeneous.
5. Total output of the economy is divided between consumption and investment expenditures.
6. The quantity of money is given. Money is only a medium of exchange.
7. Wages and prices are flexible.
8. Money wages and real wages are directly related and this relationship is proportional.
9. Capital stock and technological knowledge are given in the short run.

Now we study the three pillars of classical theory.

1.3. Say's Law of Markets:

Say's law of markets is the core of the classical theory of employment. An early 19th century French Economist, J.B. Say, enunciated the proposition that "supply creates its own demand." Therefore, there cannot be general overproduction and the problem of unemployment in the economy. On the other hand, if there is general overproduction in the economy, then some labourers may be asked to leave their jobs. There may be the problem of unemployment in the economy for some time. In the long-run, the economy will automatically tend toward full employment.

In Say's words, "It is production which creates markets for goods. A product is no sooner created than it, from that instant, affords a market for other products to the full extent of its own value. Nothing is more favourable to the demand of one product, than the supply of another." This definition explains the following important facts about the law.

Production Creates Market (Demand) for Goods:

When producers obtain the various inputs to be used in the production process, they generate the necessary income. For example, producers give wages to labourers for producing goods. The labourers will purchase the goods from the market for their own use. This, in turn, causes the demand for goods produced. In this way, supply creates its own demand.

Barter System as its Basis:

In its original form, the law is applicable to a barter economy where goods are ultimately sold for goods. Therefore, whatever is produced is ultimately consumed in the economy. In other words, people produce goods for their own use to sustain their consumption levels.

Say's law, in a very broad way, is, as Prof. Hansen has said, "a description of a free-exchange economy. So conceived, it illuminates the truth that the main source of demand is the flow of factor income generated from the process of production itself. Thus, the existence of money does not alter the basic law.

General Overproduction Impossible:

If the production process is continued under normal conditions, then there will be no difficulty for the producers to sell their products in the market. According to Say, work being unpleasant, no person will work to make a product unless he wants to exchange it for some other product which he desires. Therefore, the very act of supplying goods implies a demand for them. In such a situation, there cannot be general overproduction because supply of goods will not exceed demand as a whole. But a particular good may be over produced because the producer incorrectly estimates the quantity of the product which others want. But this is a temporary phenomenon, for the excess production of a particular product can be corrected in time by reducing its production.

J.S. Mill supported Say's views regarding the impossibility of general overproduction and general unemployment. According to him, Say's law of markets does not consider the possibility of general overproduction and also rejects the possibility of decrease in the demand of goods produced in the economy. By employing more factors of production, there is an increase in the level of employment and therefore profits are maximised.

Saving-Investment Equality:

Income accruing to the factor owners in the form of rent, wages and interest is not spent on consumption but some proportion out of it is saved which is automatically invested for further production. Therefore, investment in production is a saving which helps to create demand for goods in the market. Further, saving-investment equality is maintained to avoid general overproduction.

Rate of Interest as a Determinant Factor:

Say's law of markets regards the rate of interest as a determinant factor in maintaining the equality between saving and investment. If there is any divergence between the two, the equality is maintained through the mechanism of the rate of interest.

If at any given time investment exceeds saving, the rate of interest will rise. To maintain the equality, saving will increase and investment will decline. This is due to the fact that saving is regarded as an increasing function of the interest rate, and investment as a decreasing function of the rate of interest. On the contrary, when saving is more than investment, the rate of interest falls, investment increases and saving declines till the two are equal at the new interest rate.

The process of generation of the equality between saving and investment is shown in Figure 1.1.

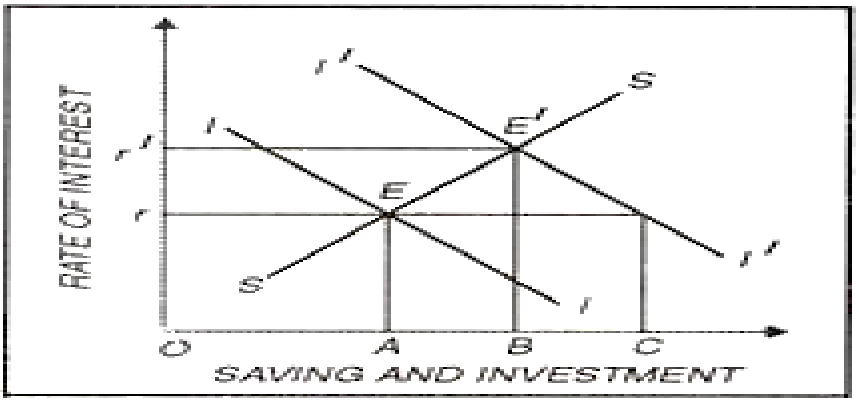

Fig.1.1 Rate of Interest equates saving and Investment

Where SS is the saving curve and II is the investment curve. The two curves intersect at E where the rate of interest gets determined at the level of Or and both saving and investment are equal to OA. If there is an increase in investment, the investment curve shifts to the right and is shown as I′I′ curve and at the interest rate Or, investment OC is greater than OA saving. According to the classical economists, the saving curve SS remains at its original level when there is any increase in investment. To maintain the equality between saving and investment, the rate of interest will rise. This is shown in the figure to rise to Or′. At this interest rate, the saving curve SS intersects the investment curve I′I′ at E'. Consequently, both saving and investment equal the quantity shown as OB.

Labour Market:

Prof. Pigou formulated Say's law in terms of labour market. By giving minimum wages to labourers, according to Pigou, more labourers can be employed. In this way, there will be more demand for labour. As pointed out by Pigou, "with perfectly free competition…there will always be at work a strong tendency for wage rates to be so related to demand that everybody is

employed." Unemployment results from rigidity in the wage structure and interferences in the working of the free market economy. Direct interference comes in the form of minimum wage laws passed by the state. The trade unions may be demanding higher wages, more facilities and reduction in working hours. In short, it is only under free competition that the tendency of the economic system is to provide automatically full employment in the labour market.

1.3.1. Propositions and Implications of the Law:

Say's propositions and its implications present the true picture of the market law. These are given below:

1. Full Employment in the Economy:

The law is based on the proposition that there is full employment in the economy. Increase in production means more employment to the factors of production. Production continues to increase until the level of full employment is reached. Under such a situation, the level of production will be maximum.

2. Proper Utilization of Resources:

If there is full employment in the economy, idle resources will be properly utilized which will further help to produce more and also generate more income.

3. Perfect Competition:

Say's law of market is based on the proposition of perfect competition in labour and product markets.

Other conditions of perfect competition are given below:

(a) Size of the Market:

According to Say's law, the size of the market is large enough to create demand for goods. Moreover, the size of the market is also influenced by the forces of demand and supply of various inputs.

(b) Automatic Adjustment Mechanism:

The law is based on this proposition that there is automatic and self-adjusting mechanism in different markets. Disequilibrium in any market is a temporary situation. For example, in capital market, the equality between saving and investment is maintained by the rate of interest while in the labour market

the adjustment between demand and supply of labour is maintained by the wage rate.

(c) Role of Money as Neutral:

The law is based on the proposition of a barter system where goods are exchanged for goods. But it is also assumed that the role of money is neutral. Money does not affect the production process.

4. Laissez-faire Policy:

The law assumes a closed capitalist economy which follows the policy of laissez-faire. The policy of laissez-faire is essential for an automatic and self-adjusting process of full employment equilibrium.

5. Saving as a Social Virtue:

All factor income is spent in buying goods which they help to produce. Whatever is saved is automatically invested for further production. In other words, saving is a social virtue.

1.3.2. Criticisms of Say's Law:

J.M. Keynes in his General Theory made a frontal attack on the classical postulates and Say's law of markets.

He criticised Say's law of markets on the following grounds:

1. Supply does not create its Demand:

Say's law assumes that production creates market (demand) for goods. Therefore, supply creates its own demand. But this proposition is not applicable to modern economies where demand does not increase as much as production increases. It is also not possible to consume only those goods which are produced within the economy.

2. Self-adjustment not Possible:

According to Say's law, full-employment is maintained by an automatic and self-adjustment mechanism in the long run. But Keynes had no patience to wait for the long period for he believed that "In the long-run we are all dead." It is not the automatic adjustment process which removes unemployment. But unemployment can be removed by increase in the rate of investment.

3. Money is not Neutral:

Say's law of markets is based on a barter system and ignores the role of money in the system. Say believes that money does not affect the economic activities of the markets. On the other hand, Keynes has given due importance to

money. He regards money as a medium of exchange. Money is held for income and business motives. Individuals hold money for unforeseen contingencies while businessmen keep cash in reserve for future activities.

4. Over Production is Possible:

Say's law is based on the proposition that supply creates its own demand and there cannot be general over-production. But Keynes does not agree with this proposition. According to him, all income accruing to factors of production is not spent but some fraction out of it is saved which is not automatically invested. Therefore, saving and investment are always not equal and it becomes the problem of overproduction and unemployment.

5. Underemployment Situation:

Keynes regards full employment as a special case because there is underemployment in capitalist economies. This is because the capitalist economies do not function according to Say's law and supply always exceeds its demand. For example, millions of workers are prepared to work at the current wage rate, and even below it, but they do not find work.

6. State Intervention:

Say's law is based on the existence of laissez-faire policy. But Keynes has highlighted the need for state intervention in the case of general overproduction and mass unemployment. Laissez-faire, in-fact, led to the Great Depression.

Had the capitalist system been automatic and self-adjusting? This would not have occurred. Keynes, therefore, advocated state intervention for adjusting supply and demand within the economy through fiscal and monetary measures.

7. Equality through Income:

Keynes does not agree with the classical view that the equality between saving and investment is brought about through the mechanism of interest rate. But in reality, it is changes in income rather than the rate of interest which bring the two to equality.

8. Wage-cut no Solution:

Pigou favoured the policy of wage-cut to solve the problem of unemployment. But Keynes opposed such a policy both from the theoretical and practical points of view. Theoretically, a wage-cut policy increases unemployment

instead of removing it. Practically, workers are not prepared to accept a cut in money wage. Keynes, therefore, favoured a flexible monetary policy to a flexible wage policy to raise the level of employment in the economy.

9. Demand creates its own supply:

Say's law of market is based on the proposition that "supply creates its own demand". Therefore, there cannot be general overproduction and mass unemployment. Keynes has criticized this proposition and propounded the opposite view that demand creates its own supply. Unemployment results from the deficiency of effective demand because people do not spend the whole of their income on consumption.

1.4. Aggregate Demand and Aggregate Supply (AD-AS Model)

Aggregate Demand Curve

The Aggregate Demand curve gives all combinations of price and output where the goods and financial markets are simultaneously in equilibrium. It is derived as

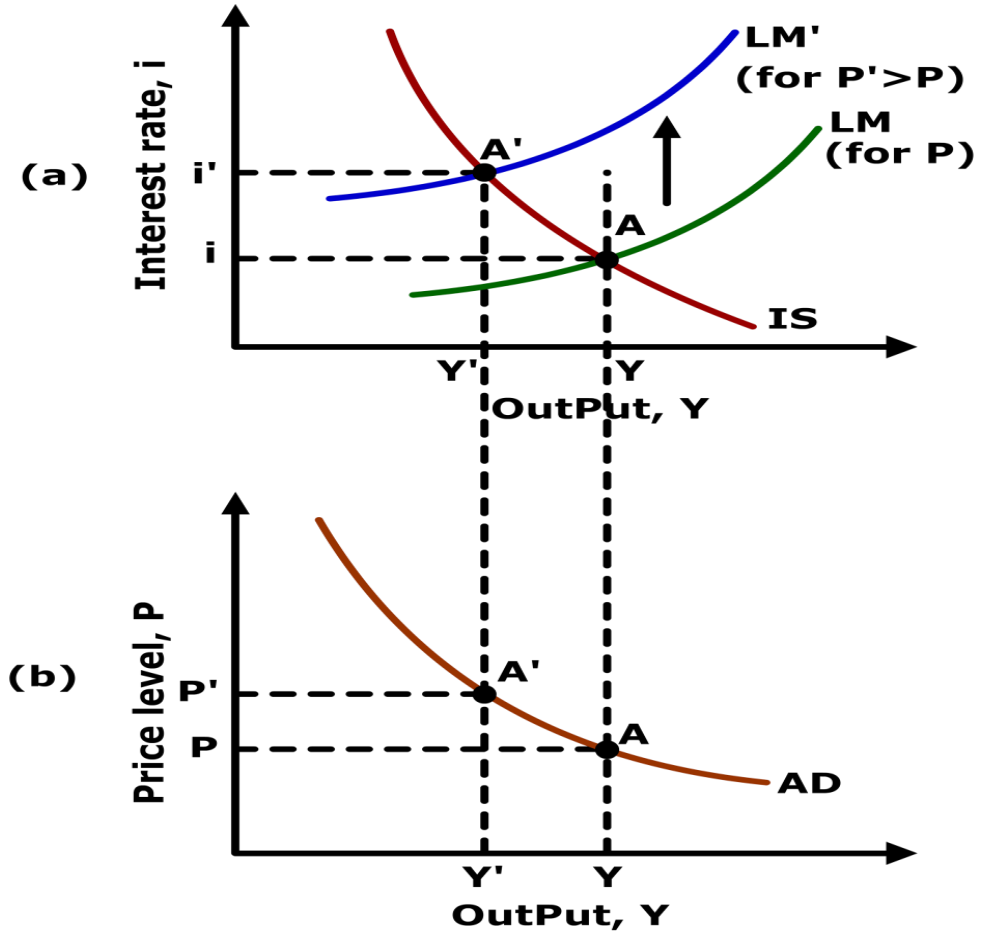

Fig. 1.2. Derivation of Aggregate Demand

The AD curve traces out the points where the IS and LM curves intersect. Suppose initially that we have our LM curve drawn for a given price level P. This curve intersects the IS curve at point A, and we plot this price-output combination in the lower panel. Now, suppose that there is a rise in the price level from P to P'. This would lower the real money supply M/P. To maintain the equilibrium in the financial market the money demand should also be lowered, and this is achieved by increasing the interest rate. So at the same level of output, the interest rate rises causing the LM curve to shift up to LM'. It now intersects the IS curve at point A' and we plot it again on the lower panel. Changing the price level and plotting all new equilibrium points will give us our AD curve. As can be seen from the curve in the lower panel, an increase in prices causes the output to fall.

Aggregate Supply curve

The AS curve tells us the amount of output firms are willing to supply at different price levels. The AS relation can be found using the following method: The nominal wage can be determined as the following:

W = Pe F(u,*z*) (i) Herein,

P e = Expected Price level.

If the labourers think that there will be a rise in the commodity prices in the future, then they will ask for an increase in their wages. If firms think that the price of their goods will rise in the future, they will be willing to give a wage raise. If both labourers and firms think the price level will change, they will change the wage accordingly. We look at the expected price and not the nominal price because the wage contracts are set before the actual price level is known.

u = Unemployment rate A rise in the unemployment rate will lower the bargaining power of the labourers and hence cause their wages to fall.

z = z takes into account all other variables except Pe and u that affect the wage like social security, unemployment insurance etc. We assume that wages vary positively with *z*. We can determine the price as the following:

To simplify our model, we assume the production function depends only on 1 factor, labour and hence can be written as Y= CL where, Y=output, N= Labour input C= Constant.

In this model, C would represent constant labour productivity.

We can choose the units of output so that one worker produces one unit of output so that C=1.

Now our production function becomes Y=N

In a perfectly competitive we would then have price equal to marginal cost, which in this case would be cost of one additional unit of worker i.e. W. However, perfect competition is rarely observed and firms charge a price higher than the marginal cost.

This can be easily captured by the following formula: P = (1+m) W …. (ii)

Where m is the mark-up of price over cost.

u =U/L= (N-L)/L= 1-N/L= 1-Y/L ……. (iii)

Where, U= Unemployment, L= Labour Force, N=employment

Substituting the value of W from equation (i) and u from equation (ii) in equation (ii) we get, P=Pe (1+m)F(1-Y/L,z

We can see from this equation that given expected price level, an increase in output causes an increase in price level (u= 1-Y/L varies negatively with wages) This happens because an increase in output raises employment (or lowers unemployment), thereby increasing the bargaining power of labour and hence their wages. This rise in wages translates into an increase in prices.

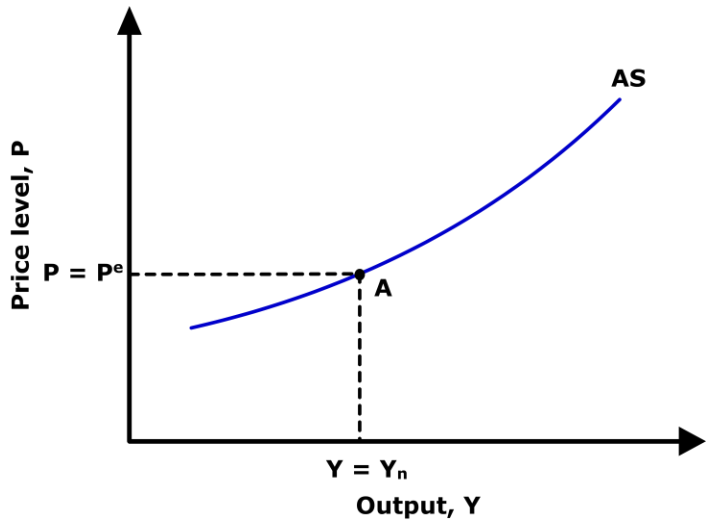

Fig.1.3. Aggregate Supply

Therefore, the AS curve is upward sloping. A rise in the expected price level will shift the AS curve upwards.

Classical Model of Aggregate Demand and Aggregate Supply

The AS and AD curves together determine the equilibrium price and income. The AS curve has two extreme cases based on the two different schools of thought Keynesian and Classical. The classical aggregate supply curve is

vertical implying that the amount of goods supplied will be the same no matter what the price is. This happens because in classical case we assume that the economy is at full employment level. This can be understood as follows, suppose we have an economy where all factors are fully employed. Now a firm wants to raise output in response to an increase in demand. Had there been some unutilised resources it could have employed them, however as all resources are already in use, there is no way to increase in production and all that happens is that there is a rise in prices, and hence wages.

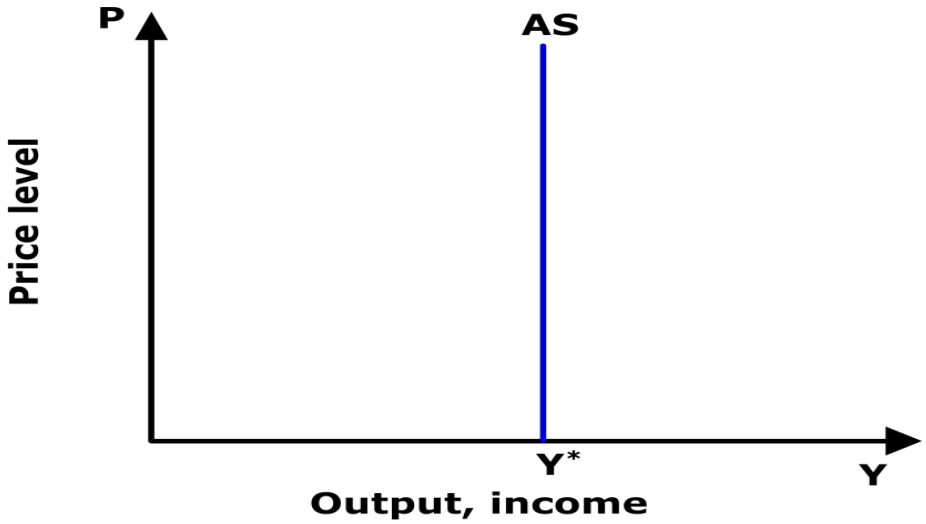

Fig.1.4 Vertical AS Function

We will now see the effects of a vertical supply schedule.

The firms will supply the output Y* no matter the price level. We will do the working for an increase in aggregate demand. AS is the aggregate supply schedule AD is the original aggregate demand schedule E denotes the original equilibrium. It will have full employment level as under classical case firms supply output attained at full employment of available resources.

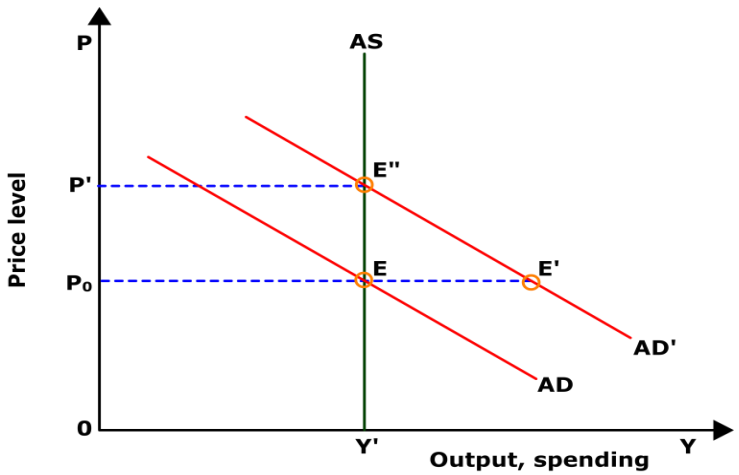

Fig.1.5. Shift in AD Function

Now say, because of the rise in demand AD curve shifts outward to AD'. So, at original prices quantity demanded is E'. However, as firms were producing only output E, they try to increase production. To increase production, they try to hire more labour, however as all labour is fully employed, there can be no new hiring and only shifting of labour from one firm to another. To attract labour firms, increase their wages offered, but this raises the cost of production and hence prices start to increase. A rise in prices reduces the real money stock M/P, and hence we start moving left along the AD curve. This shift happens till the prices have risen enough to reach the full employment level of output. Therefore, the net result is an increase in prices and no change in output. E" is our new equilibrium.

Comparison of Classical Aggregate supply (AS) With Keynesian AS

In Keynesian AS we assume that firms will supply any amount of output at a given price. The intuition behind this kind of a supply curve is that there are underutilised resources in the economy, and such if need arises firms can hire more labour at the same wages. The notion of short-term price stickiness arises from here. If the AD curve shifts outward in this case, then the only effect is an increase in output (and hence employment) with no change in prices. Firms will supply any amount of output at given prices, so if demand rises, they simply increase their output. As some labour was unemployed, now they do not need to attract labour from other firms and can get the required amount of labour at the same wages.

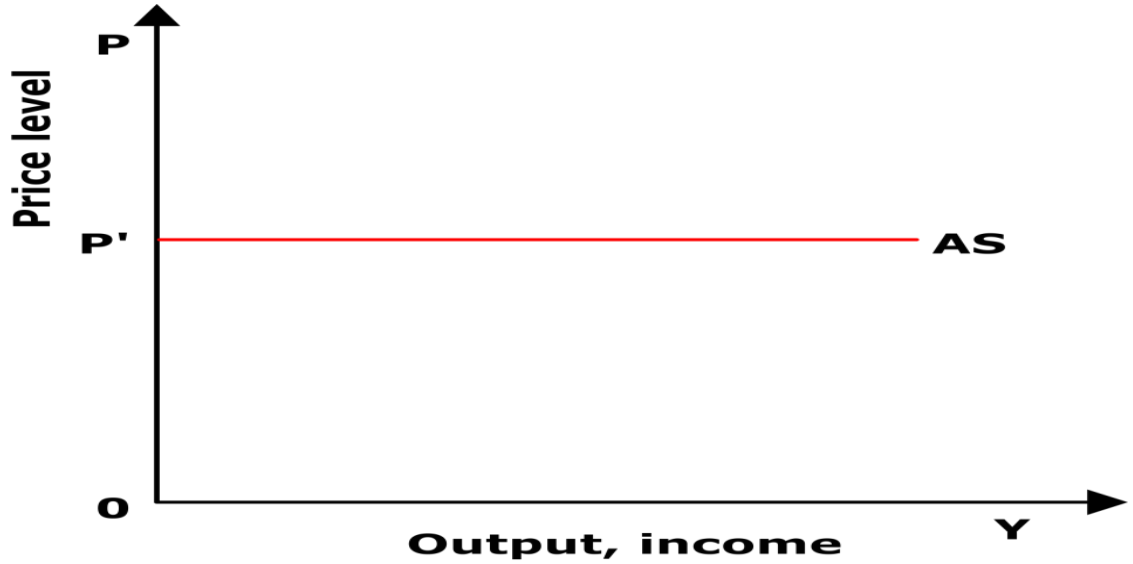

Fig.1.6. Aggregate Supply Function under Keynesian Assumption

As wages are unchanged, there is no increase in cost of production and hence, no increase in prices.

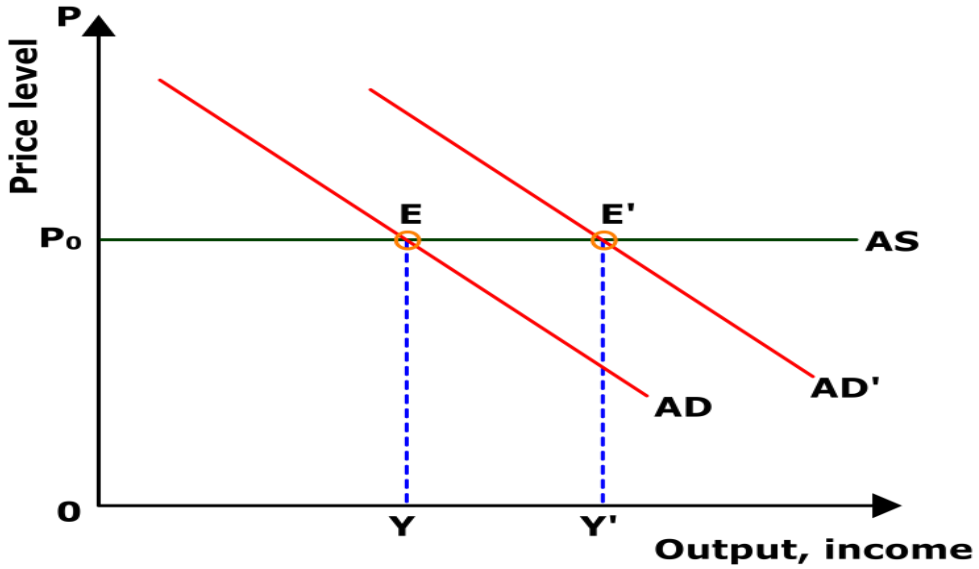

Fig.1.7. Wage Price Rigidity under Keynesian

These models are not representations of different worlds. Both types of AS curves are true. Keynesian AS holds in the short run, while the Classical AS in the long run. The positively sloped supply curve we are familiar with holds occurs in the midterm.

1.5. Keynesian Theory of Output and Employment

As per Keynes theory of employment, effective demand signifies the money spent on the consumption of goods and services and on investment. The total expenditure is equal to the national income, which is equivalent to the national output. Therefore, effective demand is equal to total expenditure as well as national income and national output. The theory of Keynes was against the belief of classical economists that the market forces in capitalist economy adjust themselves to attain equilibrium. He has criticized classical theory of employment in his book. General Theory of Employment, Interest and Money. Keynes not only criticized classical economists, but also advocated his own theory of employment. His theory was followed by several modern economists. Keynes book was published post-Great Depression period. The Great Depression had proved that market forces cannot attain equilibrium themselves; they need an external support for achieving it. This became a major reason for accepting the Keynes view of employment.

The Keynes theory of employment was based on the view of the short run. In the short run, he assumed that the factors of production, such as capital goods, supply of labor, technology, and efficiency of labor, remain unchanged while determining the level of employment. Therefore, according to Keynes, level of employment is dependent on national income and output. In addition, Keynes advocated that if there is an increase in national income, there would be an increase in level of employment and vice versa. Therefore, Keynes theory of employment is also known as theory of employment determination and theory of income determination.

1.6. Principle of Effective Demand:

The main point related to starting point of Keynes theory of employment is the principle of effective demand. Keynes propounded that the level of employment in the short run is dependent on the aggregate effective demand of products and services. According to him, an increase in the aggregate effective demand would increase the level of employment and vice-versa. Total employment of a country can be determined with the help of total demand of the country. A decline in total effective demand would lead to unemployment. As per Keynes theory of employment, effective demand signifies the money spent on the consumption of goods and services and on investment. The total expenditure is equal to the national income, which is equivalent to the national output. Therefore, effective demand is equal to total expenditure as well as national income and national output.

The effective demand can be expressed as follows:

Effective demand = National Income = National Output

Therefore effective demand affects employment level of a country, national income, and national output. It declines due to the mismatch of income and consumption and this decline lead to unemployment. With the increase in the national income the consumption rate also increases, but the increase in consumption rate is relatively low as compared to the increase in national income. Low consumption rate leads to a decline in effective demand. Therefore, the gap between the income and consumption rate should be reduced by increasing the number of investment opportunities. Consequently, effective demand also increases, which

further helps in reducing unemployment and bringing full employment condition.

Moreover, effective demand refers to the total expenditure of an economy at a particular employment level. The total equal to the total supply price of economy (cost of production of products and services) at a certain level of employment. Therefore, effective demand refers to the demand of consumption and investment of an economy.

Determination of Effective Demand:

Keynes has used two key terms, namely, aggregate demand price and aggregate supply price, for determining effective demand. Aggregate demand price and aggregate supply price together contribute to determine effective demand, which further helps in estimating the level of employment of an economy at a particular period of time.

In an economy, the employment level depends on the number of workers that are employed, so that maximum profit can be drawn. Therefore, the employment level of an economy is dependent on the decisions of organizations related to hiring of employee and placing them. The level of employment can be determined with the help of aggregate supply price and aggregate demand price. Let us study these two concepts in detail.

Aggregate Supply Price:

Aggregate supply price refers to the total amount of money that all organizations in an economy should receive from the sale of output produced by employing a specific number of workers. In simpler words, aggregate supply price is the cost of production of products and services at a particular level of employment.

It is the total amount of money paid by organizations to the different factors of production involved in the production of output. Therefore, organizations would not employ the factors of production until they can recover the cost of production incurred for employing them.

A certain minimum amount of price is required for inducing employers to offer a specific amount of employment. According to Dillard, “This minimum price or proceeds, which will just induce employment on a given scale, is called the aggregate supply price of that amount of employment.”

If an organization does not get an adequate price so that cost of production is covered, then it employs less number of workers. Therefore the aggregate supply price varies according to different number of workers employed. Aggregate supply price schedule is a schedule of minimum price required to induce the different quantities of employment. Thus, higher the price required to induce the different quantities of employment, greater the level of employment would be. Therefore, the slope of the aggregate supply curve is upward to the right.

Aggregate Demand Price:

Aggregate demand price is different from demand for products of individual organizations and industries. The demand for individual organizations or industries refers to a schedule of quantity purchased at different levels of price of a single product. On the hand, aggregate demand price is the total amount of money that an organization expects to receive from the sale of output produced by a specific number of workers. In other words, the aggregate demand price signifies the expected sale receipts received by the organization by employing a specific number of workers.

Aggregate demand price schedule refers to the schedule of expected earnings by selling the product at different level of employment Mo higher the level of employment, greater the level of output would be. Consequently, the increase in the employment level would increase the aggregate demand price. Thus, the slope of aggregate demand curve would be upward to the right. However, the individual demand curve slopes downward.

The basic difference between the aggregate supply price and aggregate demand price should be analyzed carefully as both of them seem to be same. In aggregate supply price, organizations should receive money from the sale of output produced by employing a specific number of workers. However, in aggregate demand price, organizations expect to receive from the sale of output produced by a specific number of workers. Therefore, in aggregate supply price, the amount of money is the necessary amount that should be received by the organization, while in aggregate demand price the amount of money may or may not be received.

Determination of Equilibrium Level of Employment:

The aggregate demand price and aggregate supply price help in determining the equilibrium level of employment. The aggregate demand (AD) and aggregate supply (AS) curve are used for determining the equilibrium level of employment, as shown in figure 1.8:

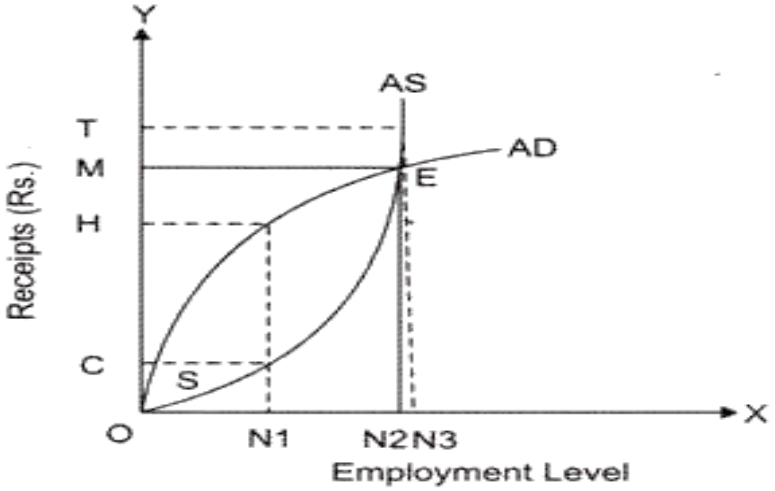

Fig.1.8 Determination of Employment level

In figure1.8, AD represents the aggregate demand curve, while AS represents the aggregate supply curve. It can be interpreted from figure that although the aggregate demand and aggregate supply curve are moving in the same direction, but they are not alike. There are different aggregate demand price and aggregate supply price for different levels of employment. AS curve, the organization would employ ON_1 number of workers, when they receive OC amount of sales receipts. Similarly, in case of AD curve, the organization would employ ON_1 number of workers with the expectation that they would produce OH amount of sales receipt for them.

The aggregate demand price exceeds the aggregate supply price or vice versa at some levels of employment. For example, at ON_1 employment level, the aggregate demand price (OH) is greater than the aggregate supply price (OC). However, at certain level of employment, the aggregate demand price and aggregate supply price become equal. At this point, aggregate demand and aggregate supply curve intersect each other. This point of intersection is termed as the equilibrium level of employment. In figure 1.8, point E represents the equilibrium level of employment because at this point, the aggregate demand curve and aggregate supply curve intersect each other.

In figure1.8, initially, there is a slow movement in the AS curve, but after a certain point of time it shows a sharp rise. This implies that when a number of workers increases initially, the cost incurred for production also increases but at a slow rate. However, when the amount of sales receipt increases, the organization starts employing more and more workers. The ON_1 numbers of workers are employed, when OT amount of sales receipts are received by the organization.

On the other hand, the AD curve shows a rapid increase initially, but after some time it gets flattened. This means that the expected sales receipts increase with an increase in the number of workers. As a result, the expectations of the organization to earn more profit increases. As a result, the organization start employing more workers. However, after a certain level, the increase in employment level would not show an increase in the amount of sales receipts.

In figure1.8, before reaching the employment level of ON_2, the employment level keeps on increasing as the organizations want to higher more and more workers to get the maximum profit. However, when the employment level crosses the ON_2 level, the AD curve is below the AS curve, which shows that the aggregate supply price exceeds the aggregate demand price. As a result, the organization would start incurring losses; therefore would reduce the employment rate. Thus, the economy would be in equilibrium when the aggregate supply price and aggregate demand price become equal. In other words, equilibrium can be achieved when the amount of sales receipt necessary and the amount of sales receipt expected to be received by the organization at a specified level of employment are equal.

1.7. Hicks Hansen IS-LM Model

The Money, interest and income into a general equilibrium model of product and money market in the Hicks-Hansen diagrammatic frame work, known as the IS-LM model. The term IS - shorthand expression of the equality of investment and saving which represents the product market equilibrium. On the other hand, the term LM is the shorthand expression of the equality of money demand (L) and money supply (M) and represents the money market equilibrium.

IS Curve

The IS function gives us the relationship between different levels of interest rate & the corresponding equilibrium levels of income. The IS function relates to product market equilibrium such that each point on the IS function represents the equilibrium between savings & investment. We know that the product market is dependent on the interplay of the forces of savings, investment, income & consumption. The investment level is autonomous as in the Keynesian analysis i.e. I=f (A). But the savings function now is determined by both income level & rate of interest, i.e. S=f(Y, r).

The equilibrium condition is S=I

It is assumed that the level of the exogenous investment is given such that the level of investment in the capital market is fixed. Capital market forces are the same as in the Keynesian economics and the equilibrium condition is also same, i.e. r = MEC

Savings functions

For deriving the IS function we need to first consider the new savings function: S=f(Y, r)

Since savings depend on both rate of interest and national income, we need to develop a method by which we can draw up a set of savings functions. We alternately change income and rate of interest and see their individual effect on savings, while the other factor is constant. We first consider the effect of income on savings. With a given level of income, there is a given level of saving s1 such that the level of income is y1 and the rate of interest (ROI) is zero. Now if the rate of interest increases, then households would be attracted to save more out of their given income level. Hence with a given level if income, we can expect savings to rise/increase. As the ROI increases further, more & more S will be forthcoming out of the same level of income. However, the marginal rate at which savings will be increasing is likely to diminish. Beyond a certain ROI, addition to savings will tend to be zero. There is a relevant' range of savings function which is indifferent to the rate of interest & hence parallel to the y axis which represents the ROI. The savings function s1 (Y1) is obtained. If the income increases from y1 to y2, a new level of savings S2 is achieved. S2 is associated with y2 level of income. Once again, the level of savings is given while the level of income remains constant because savings

increase with ROI & at certain point becomes parallel to y-axis. The new savings function is S2 (y2).

Similarly, we have S3 (y3), S4 (y4) & S5 (y5)

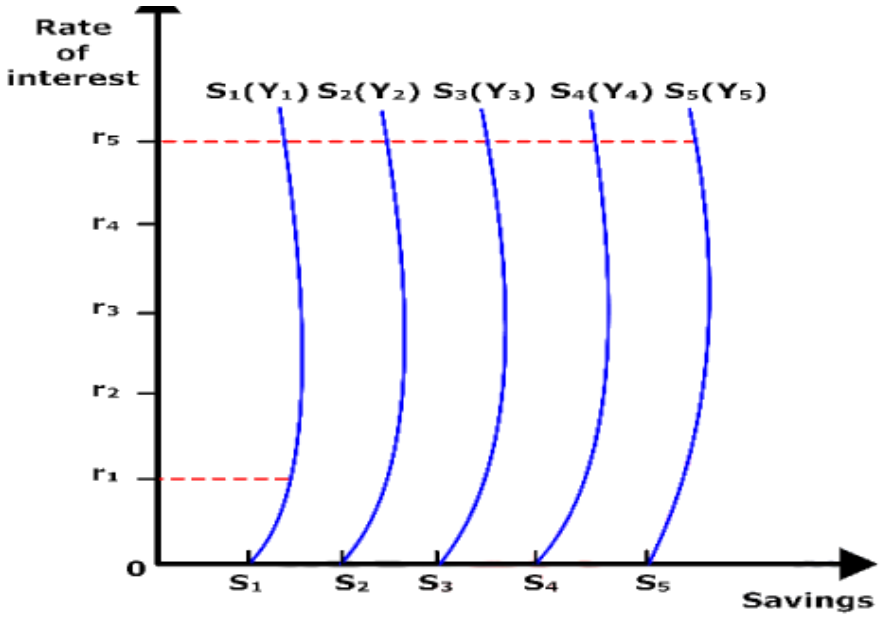

Fig.1.9. Saving Function

Derivation of IS curve we start with a ROI r5 arbitrarily & by the absurd logic proceed to a point on S5 (y5). At ROI r5, we consider the savings function S5 (y5). Given the ROI, the assumption in the capital market is that the level of investment function is given & since investment & ROI are negatively related, at r5 there can be only one volume of investment which is I1, (which is a lower volume of investment). I, is exogenous to the product market, I1 influences product market equilibrium. In the product market when investment is at level I1, for equilibrium to take place, savings also has to be at a low level. Let us say that savings would be S1. A low level of savings can be derived only from a low level of income. Therefore, it is likely that in the product market, equilibrium would take place when S=S1& is equal to investment which is I1 such that equilibrium level of income can only be y1. This gives us one point on the IS curve, i.e. (r5, y1). Similarly suppose that the rate of interest is r1. If we consider r1, a lower rate of interest with the savings function s 1 (Y1). Similarly suppose that the rate of interest is r1. If we consider r1, a lower rate of interest with the savings function S1 (y1). Then at ROI r1, in the capital market, the volume of investment is likely to be I5. Since I5 is a high level of investment, in the product market, for equilibrium to take place, savings also has to be at a high level; this is possible only when the income level is high 4.

Derivation of IS curve we start with a ROI r5 arbitrarily & by the absurd logic proceed to a point on S5 (y5). At ROI r5, we consider the savings function S5 (y5). Given the ROI, the assumption in the capital market is that the level of investment function is given & since investment & ROI are negatively related, at r5 there can be only one volume of investment which is I1, (which is a lower volume of investment). I, is exogenous to the product market, I1 influences product market equilibrium. In the product market when investment is at level I1, for equilibrium to take place, savings also has to be at a low level. Let us say that savings would be S1. A low level of savings can be derived only from a low level of income. Therefore, it is likely that in the product market, equilibrium would take place when S=S1& is equal to investment which is I1 such that equilibrium level of income can only be y1. This gives us one point on the IS curve, i.e. (r5, y1).

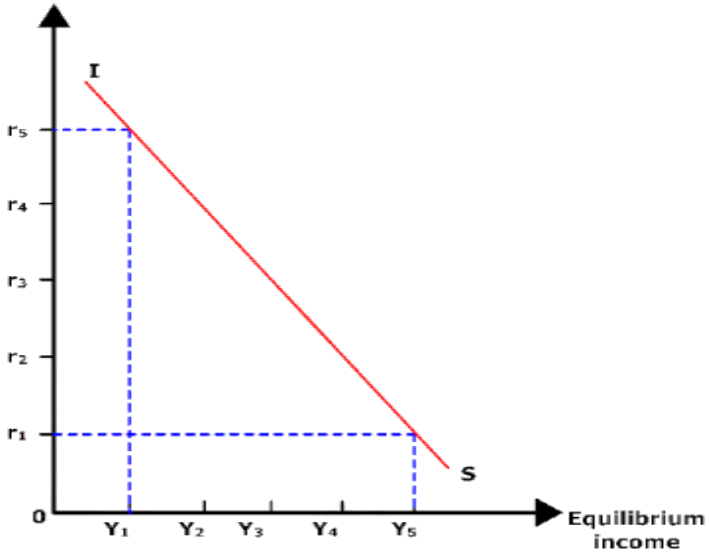

Fig.1.10. IS Function

Similarly suppose that the rate of interest is r1. If we consider r1, a lower rate of interest with the savings function s 1 (Y1). Similarly suppose that the rate of interest is r1. If we consider r1, a lower rate of interest with the savings function S1 (y1). Then at ROI r1, in the capital market, the volume of investment is likely to be I5. Since I5 is a high level of investment, in the product market, for equilibrium to take place, savings also has to be at a high level; this is possible only when the income level is high such that I5=S5 at the income level y5. So, the relevant savings function is S5 (y5) in this case. This again gives us a point on IS curve, i.e. (r1, y5). Joining the two points,

we obtain the IS curve. It is downward sloping and all points on the curve represent product market equilibrium.

LM curve

The LM function is a function that depicts the relationship between different levels of income & equilibrium rate of interest. LM relates to the money market equilibrium such that each point on the LM function represents equality of Md& Ms and the equilibrium rate of interest is determined. In the LM function the money market being determined by the interplay of forces of Md, Ms, rate of interest & income level. Here, Md=f(y,r) Ms=M & the equilibrium condition is Md=Ms.

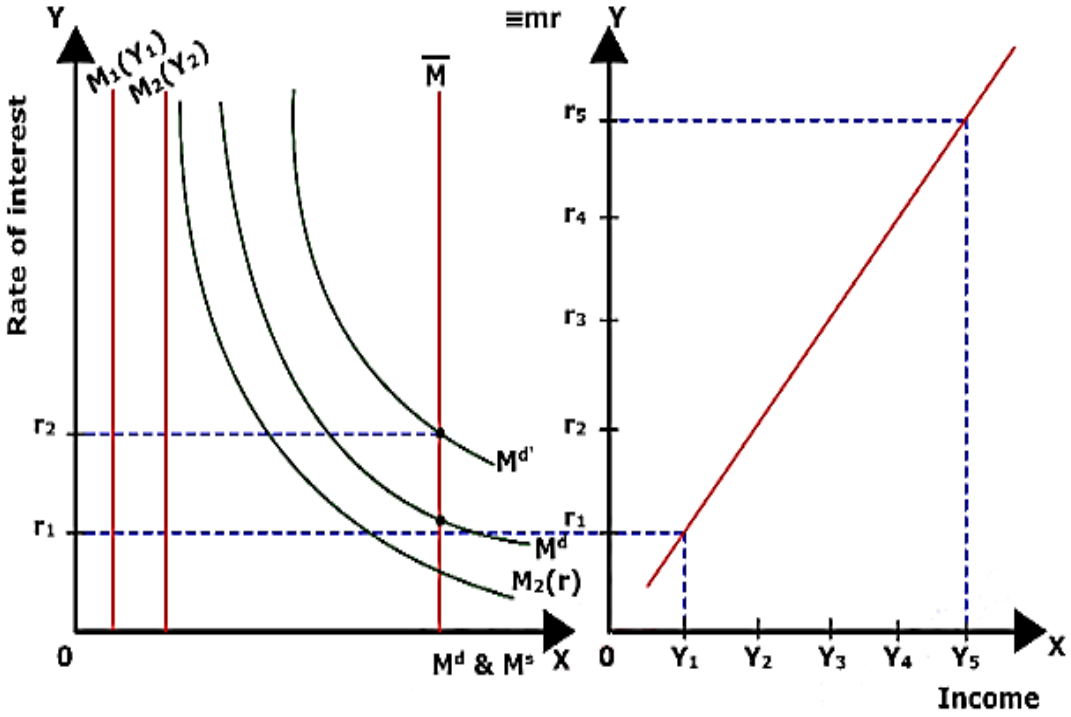

Fig.1.11. Derivation of LM Curve

The equilibrium rate of interest is r1 where Md & Ms are equal & the income level is y1, the first point of the LM curve is given by (r1, y1). Since income level is exogenously determined for the money market, whenever in the product market income changes the M1 component of Md changes because M1 is a function of income. In the product market, when the income increases from y1 to y2, then in the money market, M1 increases from M1 (y1) to M1 (y2). Correspondingly money demand increases from Md to Md'. The equilibrium ROI increases from r1 to r2 such that the new equilibrium ROI r2 is corresponding to the income level y2 this is another point on LM curve, i.e. (r2,y2). Similarly, when the income level in the product market

increases to y3, y4& y5, the corresponding = m ROI increases to r3, r4 & r5 respectively. & gives three more points on LM curve namely (r3, y3), (r4, y4) & (r5, y5). Joining these points we obtain the LM curve.

General Equilibrium in the economy

The IS curve is an equilibrium equation with two variables y & r, which gives us infinite number of points of equilibrium. But we are unable to locate a single ≡m level of income & the interest rate. The LM curve is another equilibrium equation in two variables y & r, which also gives us an infinite potential equilibrium point. But once again we are unable to locate a single ≡m level of ROI& income.

We need both IS & LM curve to determine a single equilibrium level of income & ROI as a result of solving these two simultaneous equations in two variables. We find that a single pair (r3, y3) that gives the = m in both markets, i.e. the intersection of the IS and LM curves. If the interest rate, in come pair is at r3, y3 both markets are in=m, & there is no reason for either r or y to be changing. This is known as general equilibrium or joint determination of rate of interest and national income.

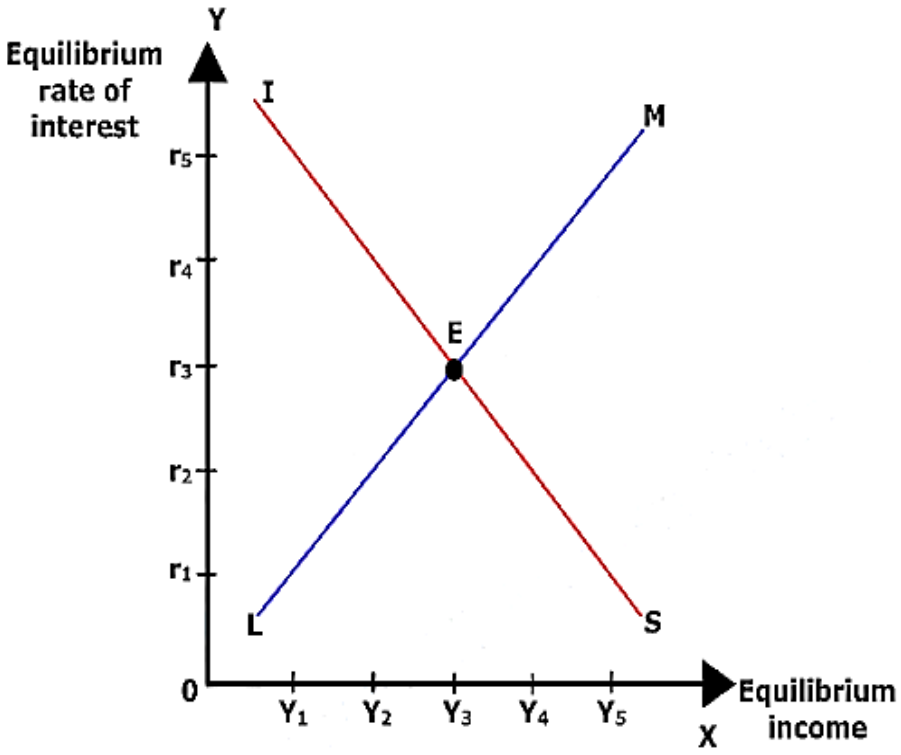

Fig.1.12. General Equilibrium

Dynamics Equilibrium in the Economy

The dynamics is the part which the economy follows when it is in disequilibrium.

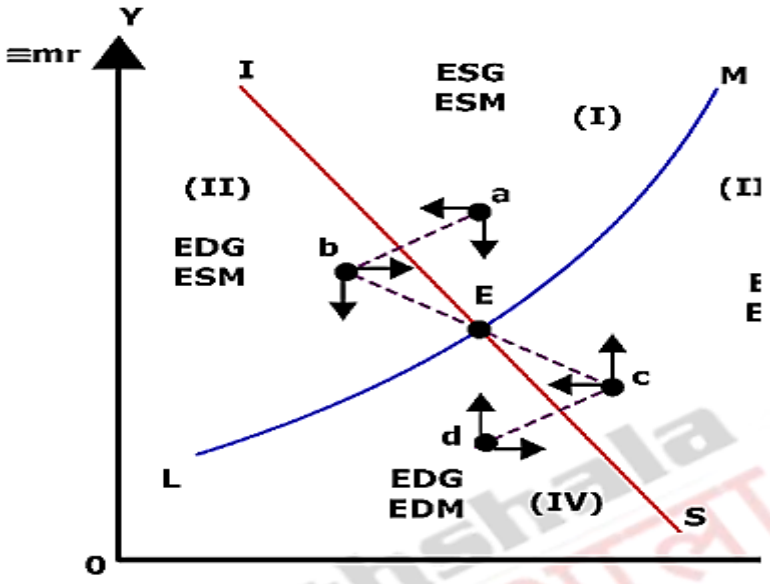

Fig. 1.13 Dynamics of Equilibrium

Here:

ESG:- Excess supply in goods market

ESG:- Excess demand in goods market

ESM:- Excess supply in goods market

ESM:- Excess demand in goods market

Point	Money Market		Product Market	
(Region)	Disequilibrium	Effect	Disequilibriumm	Effect
a(I)	ESM	roi	ESG	income
	$M^d<M^s$	falls	Ad<AS	contracts
b(II)	ESM	roi	EDG	income
	$M^d<M^s$	falls	AD>AS	expands
c(III)	EDM	roi	ESG	income
	$M^d>M^s$	rises	AD<AS	contracts
d(IV)	EDM	roi	EDG	income
	$M^d>M^s$	rises		expands

The economy moves from a to b and b to e. Also, from d to c and c to e. These are the two equilibrium paths which lead to general equilibrium from points of disequilibrium.

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UNIT - II

NEW CLASSICAL MACRO ECONOMICS

2.1. Introduction

The new classical macroeconomics is an attempt to repudiate and modify Keynesian and monetarist views about the role of macroeconomic stabilisation policy in the light of the classical school of thought. The Keynesians advocate demand management policies both fiscal and monetary to stabilise the economy. They favour active interventionist fiscal and monetary policies. They do not regard the two policies as competitive but complementary to each other. But they depend more on expansionary fiscal policy to control recessions which threaten rising unemployment with little or no growth in the economy. However, they combine deflationary fiscal policy with monetary policy to control boom and inflation. In contrast, monetarist hold that the economy is basically stable and when disturbed by some change in basic conditions will quickly revert to its long-run growth path. They are highly critical of discretionary fiscal and monetary policies. For such policies involve long and variable time lags which can make them ineffective and destabilising. However, they advocate an annual fixed percentage growth in money supply instead of discretion in monetary policy. Friedman believes that fiscal policy does not have any potent influence on the economy except that it affects the behaviour of money. Therefore, by setting and sticking to rules and not interfering, the government can follow a sound monetary policy in which there is maximum freedom for individual initiative and enterprise. The rules help to reduce people's expectations of inflation and thus create a stable environment for investment and growth.

Irregular fluctuations in economic activity, as measured by aggregate production and employment, are a persistent characteristic of market economies. The monetarists have viewed these fluctuations in a different way. The Classicals as well as Friedmanists believe in the working of the quantity theory of money and therefore formulate all their policies around those relationships. Actually, they follow a partial equilibrium approach as they consider the interaction between demand and supply of money in isolation with demand and supply of other goods and factors in rest of the economy. But Friedman shifted the focus from the demand for money and constant

velocity to the labour market and the issue of full employment. He tried to establish relationship between the expected inflation and wage inflation. He argued that in every economy, there is a natural rate of unemployment which is consistent with zero rate of wage inflation. But Friedman did not analyse the fluctuations around the natural rate of unemployment other than those induced by the government policy. He did not analyse how the private sector or the market behaves in a self-correcting manner even under the conditions of imperfect information or other market rigidities. On the other hand, Lucas has used the general equilibrium method and emphasized that equilibrium in the money market must be viewed in co-ordination with the equilibrium in other sectors of the economy. He says that the misspecifications in one part of the model representing whole of the economy, affects all other parts and therefore, there is a need of a consistent and accurate model. Lucas' version is termed as 'New Classical'. This approach gives strong policy implications. The foundations of Lucas' version actually lie in the notion of 'rational expectations'. In this context, let us first try to understand the concept of rational expectations.

2.2. Principles or Hypotheses

During the late 1970s when the debate between Keynesians and monetarists stalemated, the new classical macroeconomics emerged based on classical microeconomics. It was developed by Robert Lucas, Thomas Sargent, Robert Barro and Neil Wallace in America and Patrick Minford in England.

The new classical macroeconomics is based on the following principles or hypotheses:

(1) Markets Continuously Clear

(2) Rational Expectations

(3) Aggregate Supply Hypothesis

The hypotheses (1) and (3) are classical but their analysis is new. The second hypothesis on rational expectations is totally new. Therefore, these principles constitute the New Classical Macroeconomics which are discussed below.

1. Markets Continuously Clear:

The new classical economists assume that all markets continuously clear in the economy. Prices and wages adjust instantaneously to clear markets. The economy is in a state of continuous equilibrium both in the

short-run and long-run where all markets clear. The new classical differ from Keynesians and monetarists over market clearing. According to Keynesians, markets may not clear due to slow price adjustments. So the economy may remain in a state of disequilibrium. Monetarists assume that markets have a tendency to clear. Prices and wages are fairly flexible. Therefore, the economy may be in disequilibrium temporarily in the short run and attain equilibrium in the long run.

The new classical assume that markets clear instantaneously and there is no disequilibrium even in the short run. Since price and wage adjustments are almost instantaneous, all unemployment is equilibrium unemployment.

Whatever level of unemployment is found in the economy, it is the natural rate of unemployment or voluntary unemployment. An increase in the natural level of unemployment over time is the result of reluctance of people to take jobs due to lack of incentives.

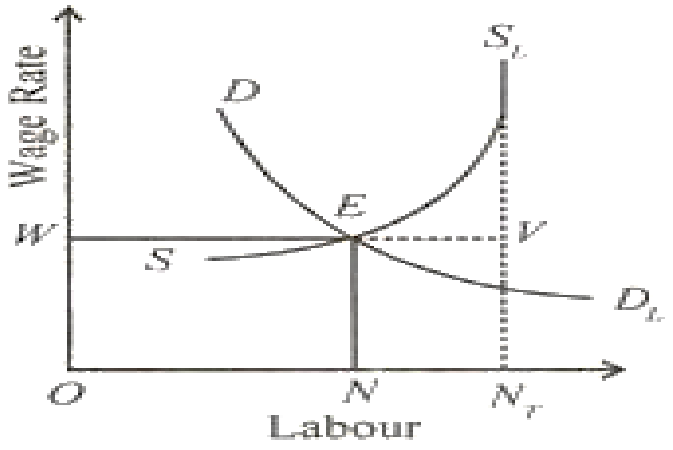

Fig.2.1

Fig. 2.1 explains the new classical labour market equilibrium. Where SS_L is the labour supply curve which is vertical (or inelastic) at ON_T labour force wage rates are above the competitive level. DD_L is the labour demand curve. ON_T is the total labour force in the economy. The two curves intersect at E which is the market-clearing equilibrium point where ON workers are willing to work at the market wage rate ON. This is the full employment equilibrium. But NN_T (= EV) workers out of the total labour force (ON_T) are not prepared to work at the market wage rate OW. They are voluntarily unemployed. They may prefer a higher wage than the equilibrium rate or leisure or other activities, etc. to work.

2. Rational Expectations:

During 1950s, Herbert. A. Simon and John Muth were jointly working on the solution to inventory management and production for a production firm, but with two opposing approaches. Simon, used the doctrine of "bounded rationality" which meant a person's limited ability to in making appropriate decisions, whereas, Muth propagated the idea of rational expectations. J.Muth's work lied between the relationship between expectations and reality. Expectations, as simply explained is what people can estimate of a variable in its future based on some set of information available them about it. It then relies on the fact how accurate their expectations were how to they revise their expectations and how very it adjusted with the actual value of the variable in future. For example, prices, if people base their information set on previous year's data in inflation and price movements, and if say, prices have been growing steadily over the years, people, thus make expectations about the price in future to also move in the same trend and hence, rise steadily in the future. This very concept of basing the expectation son lagged information is the concept of adaptive expectations and is the sheer opposite of what rational expectation is. Another example of formulation of expectation is found in well-known Cobweb model, wherein, the model describes the movement of the agriculture prices based on lagged prices in agriculture (w was given by Nerlove, 1958). Another example is the dynamic hyperinflation model, Cagan model (1956), in which velocity of money is inversely dependent on the expected inflation and expected inflation is function of past inflations. His model has the property that an increase in the expected inflation, will lead to increase in velocity of money and when velocity rises, prices will rise. With rise in prices, as expected inflation is function of past inflation, the rise in prices will further increase expectations about the inflation in future and hence a vicious circle of expected inflation, velocity of money and prices has been explained in Cagan model.

In simple terms, the rational expectations are the expectations which people make (as consumers as well as producers) by keeping in mind all the information about all the parameters over a period of time. In case of rational expectations, the mean of expectational error is assumed to be zero. Hence, in the rational expectations equilibrium, markets clear themselves and

neither the monetary policy nor the fiscal policy changes have any effect on output. Thus, the models based on rational expectations predict the irrelevance of the policy. Lucas model, however, discusses some transitory deviations from full employment and these deviations are the result of expectational errors. They are said to be transitory as they last only as long as the errors last and the errors cannot stay forever. Therefore, these deviations are eliminated as the errors are eliminated.

J.Muth suggested that economists are often interested in how expectations might change in certain circumstances, which means if an event occurs, what impact will it have on the expected value of the variable. To this he said, economists should not be satisfied with the fixed expectation formulas that do not allow for change when, the structure of the system changes. If underlying economic system changes, it will be wise to expect that there will be change in the way economic actors make their expectations. Hence, Muth suggested, what rational, should be done in a given economic system. Muth's insight was that it was possible to require economic agents to form expectations of economic variables by using the very model that actually determines these variables. The Rational Expectation Hypothesis is the most popular approach to modelling expectations in mainstream economics. The REH can be viewed as an attempt to provide neoclassical economics with a theory of expectations and beliefs formation that is a priori consistent with the optimization hypothesis. We owe its original formulation to Muth (1961) who suggests that expectations should be modelled in a way that allows them to change endogenously when the structure of the system alters. According to Muth, the Rational Expectation Hypothesis implies that economic agents´ subjective expectations are, on average, equal to the true values of the variables. In other words, it is only the average of economic agents´ forecasts that will be equal to the mathematical expectation of the variable. Thus, the forecast of a given individual may not coincide with the latter.

A capsule characterization of rational expectations contains the following themes: (1) In equilibrium (a steady state in dynamic terms), expectations are "correct" in the sense that individuals make no systematic forecast errors; (2) Individuals use all available information (as defined by the researcher) in forming forecasts; (3) Expectations vary with changes in government policy;

and (4) Individuals know "the model" and thus can predict as well as the economist manipulating the model.'

One of the most important principles of the new classical macroeconomics is the rational expectations hypothesis. The Ratex hypothesis, as it is called, holds that economic agents (individuals, firms, etc.) form expectations of the future values of economic variables like prices, incomes, etc. by using all the economic information available to them.

The new classical economists use Ratex to explain the Phillips curve in the inflation theory. According to them, rational expectations are not based on past rates of inflation but on the current state of the economy and policies being followed by the government.

Workers and firms base their information on various forecasts made by specialists and agencies, and government announcements and reports. On the basis of such current information, they predict the rate of information.

Generally, such forecasts are wrong and what the government says is also not correct. So workers and firms base their expectations on imperfect information. It is thus on the basis of imperfect information that workers and firms make predictions which will frequently be incorrect. But such errors in predictions are random which make predictions about inflation either too low or too high. Any discrepancy between the actual and expected rate of inflation is only in the nature of random error.

Thus there is no possibility for the actual rate of unemployment to differ from the natural rate even temporarily. When people act rationally, they know that past increases in prices and the rate of change in prices have invariably been accompanied by equal proportional changes in the quantity of money. When people act on this knowledge, it leads to the conclusion that there is no trade-off between inflation and unemployment either in the short run or in the long run and the new classical Phillips curve is vertical at the equilibrium or natural rate of unemployment.

The new classical short-run vertical Phillips curve is shown in Fig. 2.2 as PC at the natural unemployment rate U_N. If people under predict the rate of inflation (expected inflation rate is less than the actual rate), they will believe that aggregate demand has increased.

Fig 2.2.

As a result, output and employment rise. This shifts the short- run Phillips curve PC to the left as PC_1 because unemployment temporarily falls to U_1 below the natural rate U_N. If, on the other hand, people over-predict the rate of inflation (expected O inflation rate is more than the actual rate), they will believe that aggregate demand has fallen, and output and employment fall.

This shifts the short- run Phillips carve PC to the right as PC_2 because unemployment temporarily rises to U_2, above the natural rate U_N. But the actual position of the short-run Phillips curve on the average will be PC at the natural unemployment rate U_N.

The new classical economists also explain the downward sloping short-run Phillips curve. Such a curve arises when people are not able to correctly predict about real wages. The new classical Phillips curve is vertical at the natural rate of unemployment shown as PC in Fig. 2.2.

This is the true Phillips curve. To explain the downward sloping Phillips curve, called the apparent Phillips curve, we start at point A on the PC curve when the unemployment rate is 3% and the inflation rate is 4%. In order to reduce unemployment, the monetary authority unexpectedly increases the money supply to stimulate the economy. According to the Ratex hypothesis, firms have better information about prices in their own industry than about the general level of prices.

They mistakenly think that the increase in prices is due to the increase in demand for their products. As a result, they employ more workers in order to increase output. Unemployment falls to 2%. The workers also mistake the rise in prices as related to their own industry.

But wages rise as the demand for labour increases and workers think that the increase in money wages is an increase in real wages when the inflation rate rises to 6%. Thus the economy moves upward from point A to B. But soon workers and firms find that the increase in prices and wages is prevalent in most industries. Firms find that their costs have increased. Workers realise that their real wages have fallen due to rise in inflation rate to 6% and they press for increase in wages. But firms do not employ more workers. So the economy moves from point B to A which is the actual position of the short-run Phillips curve.

In such a situation, workers over-predict the 4% rate of inflation. Employment will fall as workers believe that their real wages are lower than they actually are. So they work less. Output falls as firms believe that the relative prices of their products have fallen. With fall in employment and output, the economy moves from point A to C due to an unanticipated fall in wages and prices. Thus, points B,A,C trace out a downward-sloping apparent short- run Phillips curve PC_1 (in Fig. 2.2) of the new classical macroeconomics when people under-predict real wages and relative prices. But the true short-run Phillips curve of the new classical is always vertical like the PC curve.

Adaptive Expectation:

Adaptive expectation hypothesis postulates that people adapt their expectations on the basis of past behaviour. A person will change his expectation on any variable by some fraction of difference between the variable's actual value last period and its expected value last period. The adaptive expectation can be represented by the following equation:

$Y_t^e - Y_{t-1}^e = \alpha [Y_{t-1} - Y_{t-1}^e]$.

Where $\alpha < 1$

This hypothesis does not predict the exact amount by which the individual will raise or lower its expectation.

It predicts that if $Y_{t-1} > Y_{t-1}^e$, then individual will raise expectation and vice-versa. Adaptive expectation hypothesis is characterised by:

1. Gradual process: Expectation formation is a gradual process. It takes some time for people to adapt to their expectations. They catch up to changes in variables eventually.

2. A general theory: Adaptive expectation theory is not peculiar to specific variable like inflation, rate of interest, rate of growth of income etc. It is a general theory and holds for all variables.

3. It relates the expected or unobserved variable to actual or observable variable. This implies that expectation of any variable can be written as a function of past value of actual variable. The coefficient attached to each lagged value is less than 1 and it declines as the length of lag increases. This implies that the most recent observation dominates the expectation formation.

A major shortcoming of adaptive expectation hypothesis is that it postulates that the agent does not take into account all the available information while making expectations and always under predict or over predict. It means that agent ignores information which could enable him to improve accuracy of expectation. If the variable, about which expectation is being formed, is continuously rising or falling then adaptive expectation is less than the variable itself if variable is rising and vice-versa. This behaviour leads to a systematic pattern in the forecasting error. Therefore, adaptive expectation assumes a sub-optimal behaviour on the part of agency forming expectations.

3. Aggregate Supply Hypothesis:

The new classical macroeconomics incorporates the Lucas aggregate supply hypothesis based on two assumptions:

(1) Rational decisions taken by workers and firms reflect their optimising behaviour, and

(2) The supply of labour by workers and output by firms depend upon relative prices. Thus the aggregate supply hypothesis is derived from optimising behaviour of workers and firms about supply of labour and goods which depend on relative prices only.

We first study the labour market and then the goods market to explain the aggregate supply hypothesis.

A. The Labour Market:

Workers make decisions about work and leisure in the present with the future in mind. They also have some idea about the normal or expected real wage. If the current real wage is above the normal real wage, workers will have

an incentive to work more in the present (take less leisure) in order to have more leisure (work less) in the future when the real wage is expected to be lower.

On the other hand, if the current real wage is less than the normal real wage, workers will have an incentive to take more leisure (work less) in the present, in anticipation of working more in the future when the real wage is expected to be higher.

This behaviour of workers to substitute current leisure for future leisure and vice versa is known as intertemporal substitution. From this, the new classical economists infer that the short-run supply curve of labour is relatively elastic because expected changes in the real wage are temporary. But the long-run supply curve of labour is vertical because the real wage is permanent and the actual and expected price levels are the same.

In the new classical analysis, workers have incomplete information about price changes so that they mistake changes in general price level for relative changes in prices and thus change the supply of labour. This results from unanticipated shocks such as monetary disturbances which change aggregate demand.

The aggregate demand and supply analysis is used to illustrate the effects of unanticipated changes in aggregate demand on the real wage level and employment. In Fig. 2.3, $LRAS_L$ is the long-run aggregate supply curve of labour and $SRAS_L$ is the short-run supply curve of labour. AD is the aggregate demand curve.

The labour market is initially in equilibrium at points where the curves $LRAS_L$, $SRAS_L$ and AD intersect. Here the real wage rate W/P is fully anticipated and OL numbers of workers are employed. Suppose the monetary authority announces its intention to increase the money supply. This will have the effect of increasing aggregate demand. This shifts rightward the AD curve to AD_1.

If the shift in aggregate demand is anticipated, rational agents will negotiate for higher real wage immediately on the basis of the expectation of rise in the price level. The $SRAS_L$ curve will shift upward to $SRAS_{L1}$. The real wage rate will move straight from W/P to W/P_2 on the vertical $LRAS_L$ curve and the labour market will move from A to C where the curves AD_1, $SRAS_{L1}$ and $LRAS_L$ intersect with no effect on the number of OL workers employed.

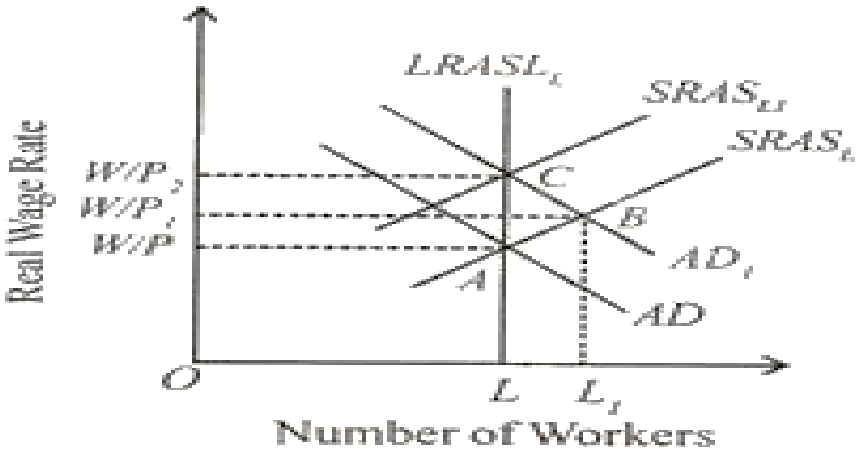

Fig.2.3.

If the shift in aggregate demand due to increase in the money supply is unanticipated, firms will misperceive the increase in general and relative prices. They will want to produce more and increase the demand for workers which will raise the real wage rate. In the figure, the AD curve will shift upward to AD_1 and intersect the $SRAS_L$ curve at point B. The number of employed workers will increase from OL to OL_1 along-with the rise in real wage to W/P_1. This increase in employment in the short-run is only temporary. But when firms fully adjust their price expectations in the long run, the $SRAS_L$ curve will shift to $SRAS_{L1}$ to intersect the AD_1 curve at C with no change in the level of OL workers employed, though at a higher real wage W/P_2.

B. The Goods Market:

Consider the goods market in Fig. 2.4 where the economy is initially in equilibrium at point A where the curves LRAS, AD and SRAS intersect. Here the price level OP is fully anticipated and OY is the long-run equilibrium level of output.

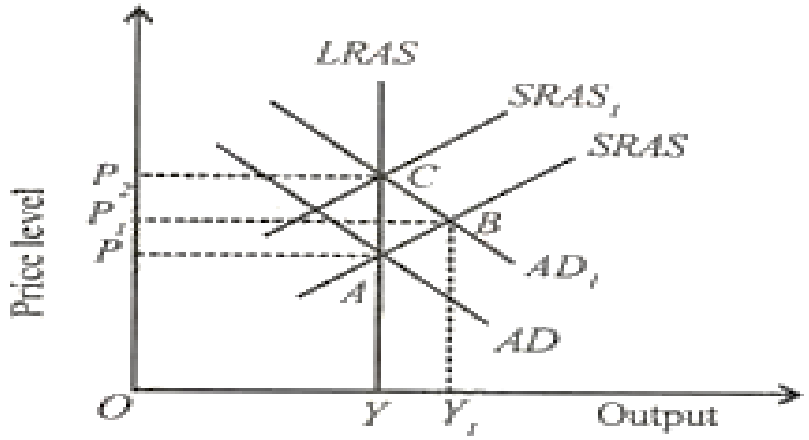

Fig.2.4.

Suppose there is increase in aggregate demand due to anticipated increase in the money supply. This will shift the AD curve upward to the right to AD_1. As a result, there is an immediate upward revision of price expectations to OP_2. Firms increase the supplies of goods and the SRAS curve shifts upward to the left to $SRAS_1$. There is now a new equilibrium at point C where the curves AD_1, $SRAS_1$ and LRAS intersect. The price level moves straight from OP to OP_2 and the economy moves from A to C with no increase in the output level OY.

However, if the increase in aggregate demand is unanticipated due to increase in the money supply, the economy moves from the initial equilibrium point A to B at the intersection of AD_1 and SRAS curves with the price level rising from OP to OP_1 and output increasing from OY to OY_1 level. But this will be only in the short run. When the economy goes through an adjustment process, it will return to its long-run equilibrium level of OY output at OP_2 price level.

2.3. Policy Implications of New Classical Macroeconomics:

The new classical macroeconomics has a number of policy implications which are explained as under:

1. Policy Ineffectiveness Proposition:

The new classical macroeconomic analysis holds that with rational expectations and flexible prices and wages, monetary policy, if anticipated in advance, will have no effect on output and employment in the short run. This is the policy ineffectiveness proposition. It is only an unanticipated increase in the money supply that will affect output and employment.

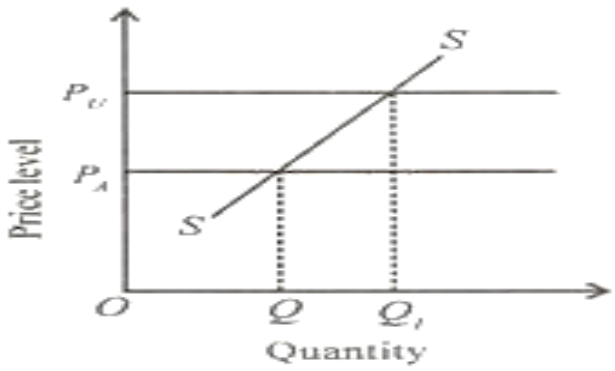

Fig.2.5.

The policy ineffectiveness proposition is explained in Fig. 2.5 in terms of a supply curve of firms. The relative price at which firms sell the good is taken

on the vertical axis and the quantity supplied on the horizontal axis. SS is the supply curve. OP_A is the anticipated relative price and OP_U is the unanticipated relative price of the good.

Suppose the monetary authority increases the money supply and if prices are flexible, all prices will rise in the economy. If the increase in the money supply is unanticipated, firms think that their own prices have risen. They are fooled into thinking that the relative price of the good has increased from OP_A to OP_U. So they increase the quantity supplied from OQ to OQ_1.

On the other hand, if the increase in the money supply is anticipated, firms cannot be fooled into thinking that relative price has increased. They know that prices of all firms have risen. So they keep their quantity supplied at OO and there will be no change in output. Thus an anticipated increase in the money supply has no effect on output which proves the policy ineffectiveness proposition.

2. Impotency of Systematic Monetary Policy:

According to the new classical analysis, anticipated changes in aggregate demand will have no effect on output and employment even in the short run by pursuing a systematic monetary policy. A systematic monetary policy is one which takes into account any known "rule". Such a policy can be fully predicted by the private sector before the monetary authority actually acts upon it. So private buyers and sellers who anticipate increase in the money supply adjust their purchases and sales through flexible wages and prices. Further, the new classicists argue that non- systematic (or discretionary or unanticipated) monetary policy will only bring changes in output and employment around their natural levels. Therefore, to prevent unanticipated changes in aggregate demand and unemployment deviating from its natural level, the new classical advocate clear monetary rules and avoidance of any discretionary monetary policy.

3. Policy Credibility:

The new classical approach is based on the presumption that rational economic agents have expectations about what the monetary authority is going to announce and this influences their behaviour. But it is on the credibility of policy announcements of monetary authority that agents form expectations.

Thus the new classical policy implies that announced (or anticipated) changes in monetary policy will have no effect on output and employment even in the short run provided the policy is credible. Suppose there is an announced and credible reduction in the money supply. This will immediately lead to a downward revision of inflation expectations of rational economic agents. This will, in turn, enable the monetary authority to have disinflation without output and employment costs.

4. The Lucas Critique:

Robert Lucas criticised the building of econometric macroeconomic models of the economy for policy evaluation. According to Lucas, such models were based on parameters derived from past data collected under particular policies. Any attempt to use such macroeconomic models to predict the consequences of alternative policies may be wrong. This is because the parameters of such models may change as economic agents adjust their expectations and behaviour to the new policy.

Lucas argued that although economic agents act in a certain way, it is erroneous to assume that they would continue to act in the same way, if economic policy is changed. Suppose workers anticipate inflation to be 5 per cent next year and they demand 5 per cent wage increase.

Anticipating it, if the monetary authority increases the money supply, inflation rises to 10 per cent. This reduces the real income of workers, and firms finding cheap labour, employ more workers to make more goods. This would increase output by reducing the real wage of workers whose expectations of 5 per cent turn out to be wrong.

According to Lucas, such a policy may succeed once or twice. But if the monetary authority continues such a policy, people would expect higher inflation in future and the policy would fail. The monetary authority cannot fool the people all the time.

Thus the Lucas critique points out that workers and firms are assumed to choose their actions in the light of existing policies. If there is a major change in policy, it will change people's behaviour and expectations. The general implication of the Lucas critique is that the effects of policy changes are difficult to forecast accurately and they can be learnt by experience.

5. Policies to Increase Aggregate Supply:

One of the important policy implications of new classical macroeconomics relates to the nature of policies to be followed by the authorities to increase output and reduce unemployment. In the new classical analysis, changes in output and employment are based on the equilibrium supply decisions of firms and workers given their perceptions of relative prices. It follows that the appropriate policy measures to increase output and reduce unemployment are directed toward increasing aggregate supply of output and labour. New classical macroeconomists recommend a variety of measures to increase output and reduce unemployment that indirectly increase aggregate supply of output and labour. They relate to reduction in the power of trade unions, reduction in unemployment benefits, tax reforms to remove poverty and raise incomes of the unprivileged, measures to increase geographical and occupational mobility of labour, etc.

2.4. Criticisms of New Classical Macroeconomics:

The new classical macroeconomics has been criticised mainly on the basis of its hypotheses and policy implications:

1. Rational Expectations Hypothesis Unrealistic:

The rational expectations hypothesis which is the backbone of the new classical approach has four main objections. First, it costs much to acquire process and disseminate publicly available information. So the majority of economic agents cannot act on the basis of rational expectations.

Second, the critics point out that information available to government differs from that available to firms and workers. Consequently, expectations of the latter about the expected rate of inflation need not necessarily diverge from the actual rate only by the random error. But the government can accurately forecast about the difference between the expected inflation rate and actual rate on the basis of information available with it.

Third, even if both people and government have equal access to available information there is no guarantee that expectations will be rational. Fourth, as the cost of acquiring, processing and disseminating publicly available information is very high, economic agents may form expectations which are systematically wrong. Thus the rational expectations hypothesis is unrealistic

and the new classical macroeconomics which is based on it stands on weak foundations.

2. Markets do not continuously clear:

Critics do not accept the hypothesis that all markets continuously clear. They point out that prices and. wages are not flexible. There is collective bargaining in the labour market which leads to wage contracts leading to stickiness of money wages. The rigidity of wage rates implies that they adjust to market forces relatively slowly because wage contracts are binding for two or three years at a time. Similarly the expected price level at the beginning of the period is expected to hold till the end of the period. As a result, labour market and goods market are unable to clear continuously. As pointed out by Tobin, "The market-clearing assumption is just an assumption and nothing more than that".

3. Aggregate Supply Hypothesis Unacceptable:

Economists do not accept the aggregate supply hypothesis that changes in output and employment reflect voluntary response of workers and firms to perceived changes in relative prices. According to them, it is changes in aggregate demand announced by the monetary authority that influence output and employment both in the short run and long run.

4. Policy Implications Unacceptable:

Critics do not accept the policy implications of new classical macroeconomics because they are derived from unrealistic hypotheses. Economists like Phillips, Taylor and Fischer have demonstrated that if wages and prices are not completely flexible, monetary policy becomes effective in the short run. It can influence output and employment in the short run even if expectations are rational.

Further, as firms do not know enough about the structure of the market to estimate the market-clearing price level and there are non-clearing labour markets due to wage rigidity, economists do not accept the impotency of monetary policy.

4. Empirical Evidence:

There has been some empirical evidence for and against the new classical macroeconomics. Economists like Sargent, Minford, Barro, Gordon,

Blinder, etc. have constructed econometric models to test the hypotheses and policy implications of new classical macroeconomics.

The results of main empirical evidences are as under:

1. Empirical evidence on European depression shows microeconomic interferences in labour markets in the form of generous unemployment insurance when unemployment was extremely low in 1973.
2. Empirical research has not been able to find large inter temporal substitution effects in labour market
3. Lucas in his model of 1973 found evidence in support of the new classical Phillips curve that it was vertical in the short run. But Gordon's econometric study for Europe in 1987 concluded that the original empirical Phillips curve existed.
4. A number of empirical studies, one by Muth himself in 1985, have questioned the validity of rational expectations hypothesis. They used directly observed data on expectations to test rationality. These tests rejected the rational expectations.
5. Rotemberg statistically tested some macroeconomic models of rational expectations in 1984 on the basis of the three hypotheses viz., expectations are rational, markets continuously clear and aggregate supply, of the new classical theory. When tested jointly, the joint hypothesis was rejected.
6. Barro in his statistical test of unanticipated changes in money growth on output and employment came to the conclusion that it is unanticipated changes in the money stock rather actual money growth that affect output and employment with quite long lags of two to four years.

2.5. Real Business Cycle Theories

The real business cycle theory has been evolved out of the American new classical school of 1980s. It is the outcome of research mainly by Kydland and Prescott, Barro and King, Long and Plosser, and Prescott. Later, Plosser, Mankiw and many other economists gave their views of the real business cycles. They view aggregate economic variables as the outcomes of the decisions made by many economic agents acting to maximize their utility subject to production possibilities and resource constraints. Their views mainly relate to technology shocks, labour market, and interest rate, role of

money, fiscal policy, prices and wages in business cycles. They are explained below.

2.5.1. Role of Technological Shocks:

The theory of real business cycles explains short-run economic fluctuations based on the assumptions of the classical theory. According to this theory, business cycles are the natural and efficient response of the economy to economic environment.

They are primarily caused by real or supply side shocks that involve exogenous large random changes in technology. An initial shock in the form of a technological advance shifts the production function upward. This leads to increase in available resources, investment, consumption and real output. With the increase in investment, the capital stock increases which further increases real output, consumption and investment. This process of expansion of the economy continues erratically due to changes in technology over time.

According to Plosser, "It is a purely real model, driven by technology disturbances, and hence, it has been labeled a real business cycle model."

Assumptions:

The real business cycle theory is based on the following assumptions:

1. There is a single commodity in the economy.
2. Prices and wages are flexible.
3. Money supply and price level do not influence real variables such as output and employment.
4. Fluctuations in employment are voluntary.
5. Population is given. So there is fixed labour force.
6. There are rational identical economic agents in the economy.
7. These agents make optimising decisions.
8. Everyone has the same preferences which depend only on consumption in each year.
9. More consumption is preferred to less so that the marginal utility from consumption diminishes.
10. The economy is subject to irregular (random) real supply side shocks.
11. It is a single sector economy.

12. There are substantial changes in the rate of technology that affect the whole economy (which is viewed as a single sector).

13. There is constant return to scale production-technology.

14. The economy is in a steady state.

2.5.2. Technological Shock:

Given these assumptions, the production function of the economy is given by

$$Y = Zf(K,N)$$

Where Y is total output, Z is the state of technology, K is predetermined capital stock and N is labour input. The produced output can either be consumed or invested.

Assuming that population is given and there is a fixed labour force, output depends on technology and capital stock. So output is determined by the production function, Y= Zf (K). The capital stock, K depreciates at the rate S, so that the undepreciated capital stock evolves as (1-δ) K. This capital stock is available as input for production in the next period.

With a capital stock K, output is Y and the total resources available in the economy in the current period are Y + (1-δ) K.

Since Y = Zf (K), the total resources can be expressed as Zf (K) + (1-δ) K. These resources can either be consumed or accumulated as capital to be used as investment for the next period.

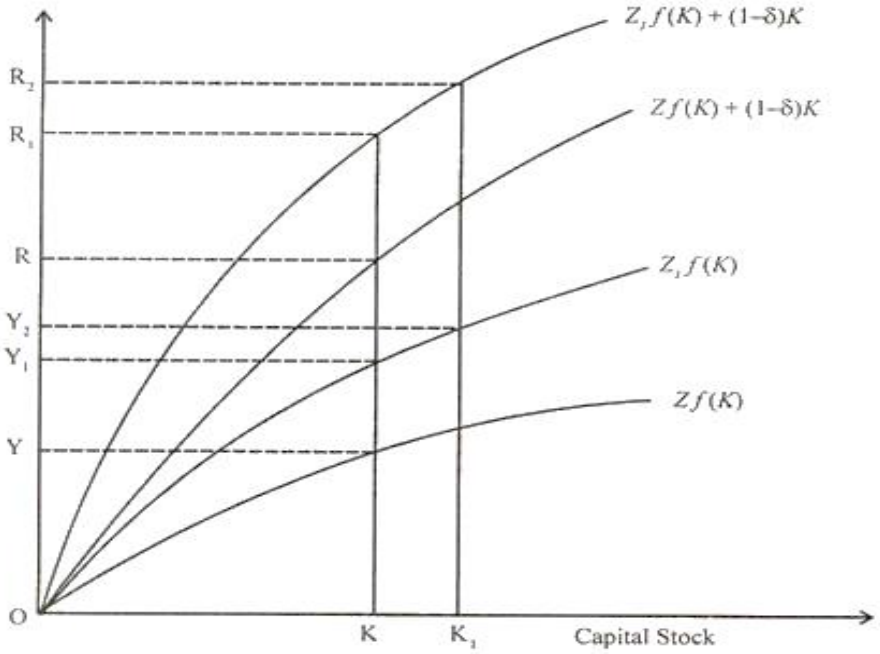

Fig.2.6

A real business cycle is generated in a steady state economy when there is a positive exogenous and permanent technological shock. This leads to increase in productivity. As a result, the aggregate production function shifts upward. The improvement in technology from the initial level Z to Z_1 and the consequent upward shift of the production function from Zf(K) to Z_1f(K) is shown in Figure 2.6. Given the initial capital stock OK, output increases from OY to OY_1.

As a result, total resources increase from OR to OR_1 and the total resources curve shifts upward from Zf(K)+(1-δ) K to Z_1f(K)+(l-δ)K. With the increase in total resources, both current consumption and capital accumulation also increase. There is increase in capital stock to OK_1.

With no change in technology, the increase in capital stock to K_1 in the next period leads to a further rise in output to OY_2 and the increase in total resources to OR_1. In this way, the economy continues to expand when consumption, investment and output increase gradually leading to a new steady state.

But the path to a new steady state will not be smooth. With a permanent technological advance, consumption and investment increase in the next period. But the increase in total resources and output is smaller than in the initial period. In Figure 2.6, R_1R_2 < R R_1 and Y_1Y_2 <YY_1.

In the long run, there is a gradual decline in investment and consumption even when output continues to increase at a decreasing rate till the economy reaches the new steady state. The paths of this real business cycle are illustrated in Figure 2.7.

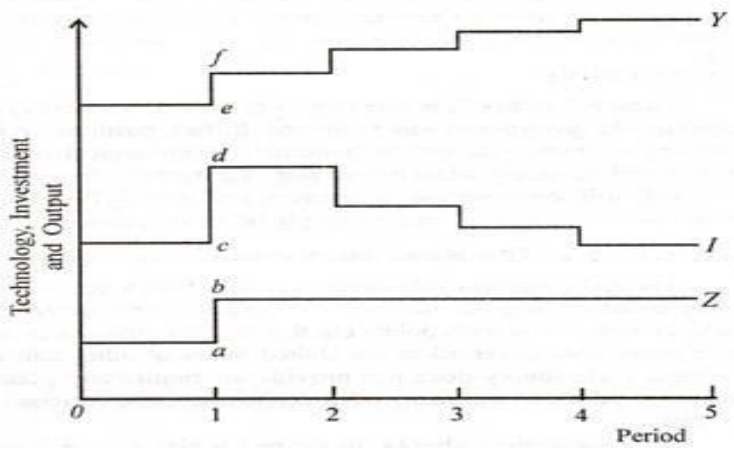

Fig.2.7.

In period 1, there is a permanent technology shock which advances technology Z from a to b. This leads to increase in investment I from c to d and output Y from e to f. Given the same level of technology Z, shown as the horizontal curve, the investment curve I gradually falls in subsequent periods but the output curve Y continues to increase at a decreasing rate till the economy reaches the new steady state in period 5.

A recession in the real business theory is just the reverse of the expansion. A shock of decline in-technology reduces Z and shifts the production function downward and decreases the available resources. This starts a process of decline in investment, consumption, output and employment. But the models of real business cycle do not explain a recession.

Labour Market:

The real business cycle theory emphasises that there is intertemporal substitution of labour in the labour market. When a technology advance leads to a boom, the marginal product of labour increases. There is increase in employment and real wage. In response to a high real wage, workers reduce leisure.

On the contrary, when technology is unfavourable and declines, the marginal product of labour, employment and real wage rate are low. In response to a low real wage, workers increase leisure. Thus an important implication of real business theory is that the real wage is procyclical.

Interest Rate:

The real business cycle theory also takes into account the role of real interest rate in response to a technological shock. The real interest is equal to the marginal product of capital. When a favourable technological change leads to a boom, the marginal product of capital and the real interest rate rise.

On the contrary, an unfavourable technical change leading to a recession reduces the marginal product of capital and the real interest rate. When the economy reaches the new steady state, the real interest rate eventually returns to its initial level.

Flexibility of Wages and Prices:

The real business cycle theory assumes than wages and prices are flexible. They adjust quickly to clear the markets. There are no market imperfections.

It is the "invisible hand" that clears the market and leads to an optimal allocation of resources in the economy.

Neutrality of Money:

Money plays no role in the real business cycle theory. Money is neutral. It is a veil. Money does not affect such real variables as employment and output. The role of money is to determine the price level. The money supply is endogenous in the real business cycle theory. It is fluctuations in output that cause fluctuations in the money supply.

For instance, when there is a favourable technological change, the output increases and the quantity of money demanded rises. The banking system responds by advancing more loans and the central bank increases the money supply. With the money supply increasing, prices rise.

Fiscal Policy:

Fiscal policy has little role to play in the real business cycle theory. Since the "invisible hand" guides the economy, the government role is limited. In fact, business cycles are the natural and efficient response of the economy to favourable and unfavourable technological shocks.

A fiscal policy measure such as a tax on income will adversely affect output and employment. An individual may choose more leisure to work leading to reduction in consumption, investment and output. To avoid tax distortions and meet its requirements, the central bank increases the money supply in the economy. So the government has no role in stabilisation policy.

2.5.3. Criticisms of the Real Business Cycle Theory:

The real business cycle theory has been highly controversial. Its exponents maintain that it is a realistic theory based on large fluctuations in output and employment displayed by the US economy. But its foremost critic, Lawrence Summers points out that the real business cycle models "have nothing to do with the business cycle phenomena observed in the United States or other capitalist economies." According to Mankiw, "Real business cycle theory does not provide an empirically plausible explanation of economic fluctuations."

Summers, Mankiw and many other economists have criticised the real business cycle theory on the following grounds:

1. Technological Shocks:

In the real business cycle theory as put forward by Prescott, the only driving force behind cyclical fluctuations is technological shocks. Critics do not agree with this. According to them, technological shocks leading to changes in total factor productivity are hard to find. There is also no direct evidence of the existence of large technological shocks. Therefore, the existence of large changes in technology is an unjustified assumption of real business cycle theory.

2. Other Factors:

This theory takes into account only supply side factors and ignores other factors like change in demand that cause business cycles.

3. Intertemporal Substitution:

In the real business cycle theory, there is intertemporal substitution of labour and work. Over the business cycle, individuals reduce the supply of labour in response to small reductions in the real wage or small decreases in real interest rate. If individuals expect increases in their real wage, they will enjoy leisure today and work more in the future. If they expect decreases in their real wage, they will work hard today and enjoy leisure in the future. But it is unlikely that individuals are so responsive to intertemporal changes in real wage. Empirical studies of individual labour supply overtime have shown that expected changes in real wage lead to only small changes in hours worked. Thus individuals do not respond to expected real wage changes by reallocating leisure to work overtime.

4. Voluntary Employment:

In the real business cycle theory, fluctuations in the employment are assumed voluntary. So it does not consider unemployment. When large numbers of people are searching for work in a recession, they are unable to find it. The theory explains why employment falls. But its explanation is based on reductions in the real wage and the real interest rate which send signals to workers that there is no work available in the labour market. Thus there is no scope for unemployed workers to find jobs and the labour market does not clear in a recession.

5. Neutrality of Money:

The real business cycle theory assumes neutrality of money. But according to critics, the empirical evidence does not support that money is

neutral in the short run. They point out that money does affect such real variables as output and employment in a boom and a recession. When there is increase in money growth and inflation, output and employment are high in a boom, and vice versa in a recession.

6. Wages and Prices:

This theory assumes that wages and prices are flexible. But critics point out that wages and prices are inflexible. They believe that changes in monetary policy lead to short-run aggregate demand disturbances that can have important real effects on output and employment because of the nominal price and wage rigidities.

7. Fiscal Policy:

The real business cycle theory assumes that the government has no role to play in stabilisation policy. If the government adopts policies to stabilise employment, they are ineffective and can harm the economy by impeding the invisible hand. But cities do not agree that stabilisation policy has no role to play.

8. Negative Technological Shocks:

This theory does not explain large negative technological shocks that mark recession. Historical evidence shows that periods of disinflation are of low output and unemployment. These effects are completely absent in the real business cycle theory.

9. Incomplete Theory:

The real business cycle theory is an imperfect and incomplete theory. It does not explain the turning points of the business cycle. No doubt real supply shocks have important effects on output and employment, they do not create peaks and troughs in the business cycle as actually observed.

Conclusion:

Despite these criticisms, as observed by Mankiw, “The real business cycle theory has served the important function of stimulating and provoking the scientific debate, but it will ultimately be discarded as an explanation of observed fluctuations.”

2.6. Stabilization Policy

A stabilization policy is a collection or set of actions brought together to stabilize a financial system or an economy. It can refer to policies which are resorted to the situations of business cycle stabilization and crisis stabilization. In these cases, stabilization refers to discretionary policies to control the given situation. Stabilization can also denote as a process for adjusting the usual behavior of the business cycle. It also refers to correcting inflation or deflation In this case the term usually denotes demand management by monetary and fiscal policy to reduce normal fluctuations and output, The policy alterations in these conditions are typically countercyclical, reimbursing for the projected deviations in employment and output, to surge short-run and medium run welfare.

2.6.1. Principle of Stabilization

1. Keynesian framework believes that aggregate demand is affected by both public and private which would include mostly the decisions related to monetary and fiscal policies. Economists quite a few decades ago argued about the relative strength of monetary and fiscal policies, with some Keynesians arguing that monetary policy is ineffective and certain monetarists disagreeing that fiscal policy is ineffective. Almost all Keynesians and monetarists now think that both fiscal and monetary policies affect aggregate demand. Some of the economists also believe in debt neutrality that the swaps of government borrowing for taxes have no effects on total demand.
2. According to Keynesian theory, deviations in aggregate demand does not have short – run effect on prices instead has the effects on real output and employment. This notion of Keynesian theory is depicted by the concept of Phillips curve. A Phillips curve shows inflation increasing gradually when unemployment falls. Keynesians believe that what is true about the short run cannot always be inferred from what can happen in long –run. Monetary policy can result in real effects on output and employment only when prices are rigid or if nominal wages do not adjust instantly. So Keynesian model generally either assumes rigid prices and wages. But rationalizing rigid prices is difficult as microeconomics postulates real output and demand should not deviate if nominal prices rise and fall proportionately. But Keynesians argue that because prices are rigid, any change in consumption, investment or

government expenditure that is component of spending would cause output to fluctuate. If government spending increases, keeping other constituents of spending constant then output will increase and it will increase by manifold of the original change in spending that caused it. For a Keynesian economics to work, though the multiplier must be larger than zero.

3. Keynesians believe that prices especially wages respond very slowly to changes in supply and demand resulting in short term shortages and surpluses of labor. Even Milton Friedman accepted that there is limited measure of flexibility in prices and wages in United States.

Conclusion:

In Keynesians and monetarists often focused on the effectiveness of policy instruments with monetarists arguing for the ineffectiveness of fiscal tools and Keynesians believing in the superiority of fiscal stabilization policy. Concerned about the possibility that monetary policy actions may themselves be a source of economic instability, Friedman argued that macroeconomic stability can be attained best by using an unconditional policy rule "k-percent" money growth rule. Friedman's basic underlying idea remains relevant that the economic system is ultimately self – stabilizing, but the available knowledge of economic system is too limited to comprehend short – run fluctuations. Robert E. Lucas assured that the welfare gains from stabilization policy are quite modest. According to the findings the potential welfare gains from improved stabilization policy going beyond stability of monetary aggregates and nominal spending is likely to be small. Some economists like David and Christina Romer suggested that severe recessions have been partly caused by over ambitious macroeconomic policies.

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UNIT - III

NEW KEYNESIAN MACRO ECONOMICS

3.1. Introduction

New Keynesian the school of thought in modern macroeconomics that evolved from the ideas of John Maynard Keynes. Keynes wrote The General Theory of Employment, Interest, and Money in the 1930s, and his influence among academics and policymakers increased through the 1960s. In the 1970s, however, new classical economists such as Robert Lucas, Thomas J. Sargent, and Robert Barro called into question many of the precepts of the Keynesian revolution. The label “new Keynesian” describes those economists who, in the 1980s, responded to this new classical critique with adjustments to the original Keynesian tenets. The primary disagreement between new classical and new Keynesian economists is over how quickly wages and prices adjust. New classical economists build their macroeconomic theories on the assumption that wages and prices are flexible. They believe that prices “clear” markets balance supply and demand by adjusting quickly. New Keynesian economists, however, believe that market-clearing models cannot explain short-run economic fluctuations, and so they advocate models with “sticky” wages and prices. New Keynesian theories rely on this stickiness of wages and prices to explain why involuntary unemployment exists and why monetary policy has such a strong influence on economic activity. A long tradition in macroeconomics (including both Keynesian and monetarist perspectives) emphasizes that monetary policy affects employment and production in the short run because prices respond sluggishly to changes in the money supply. According to this view, if the money supply falls, people spend less money and the demand for goods falls. Because prices and wages are inflexible and do not fall immediately, the decreased spending causes a drop in production and layoffs of workers. New classical economists criticized this tradition because it lacks a coherent theoretical explanation for the sluggish behavior of prices. Much new Keynesian research attempts to remedy this omission.

3.2. Core Propositions of New Keynesian Macro Economics

Some of the most important features of new Keynesian economics are as follows: 1. Sticky nominal wages 2. Sticky nominal prices 3. Sticky real wages 4. Coordination failures. New Keynesian economics was conceived in the late 1970s but several strands have evolved in new Keynesian macroeconomic theories/models since the mid-1980s.

Some of the important propositions are discussed under four broad headings:

1. Sticky nominal (money) wages
2. Sticky nominal prices
3. Sticky real wages
4. Coordination failures

1. Sticky Nominal Wages:

In the classical theory of labour market, there is always full employment in the economy and no involuntary unemployment. In case of unemployment, a cut in money wages can achieve full employment. Firms can instantly adjust the quantities of labour they employ without any cost because of the flexibility of money wages. In the Keynesian theory, involuntary unemployment exists which can be removed by cut in real wages by increasing aggregate demand, output and employment. Keynes held that money wages are sticky. Within the Keynesian tradition, new Keynesian economists have developed the new Keynesian theory of the labour market based on nominal wages stickiness.

Assumptions:

This theory is based on the following assumptions:

1. Nominal wages are sticky in the labour market.
2. They are set on the basis of contracts for a stipulated period.
3. They are set to make the expected quantity of labour demanded equal the expected quantity of labour supplied.
4. Trade unions and firms form a rational expectation of future demand and supply of labour.
5. They agree on a wage that makes the expected quantity of labour demanded equal to the expected quantity supplied on the average over the period of contract.
6. Firms determine the employment level.

7. Workers are prepared to supply the required quantity of labour demanded at the fixed money wage over the period of the contract.
8. The employment level is determined by the actual demand for labour.

Explanation:

Given these assumptions, in the new Keynesian theory of the labour market, money wages are set in contracts between workers (unions) and employers (firms) which maintain money wages over an agreed period. Such contracts are made because the demand for labour increases during recoveries and decreases during recessions which require changes in wage rates. Therefore, workers and employers find such wage contracts advantageous because there are high costs of collecting information about labour and negotiating frequent wage agreements.

When unions and firms start negotiations for agreed money wage rates over a stipulated period, they take a view of the expected demand for and supply of labour on the average. They know that setting very high wages rates will lead to very low employment on the average and large unemployment.

On the other hand, setting very low wage rates will lead to a shortage of labour. Thus both parties act rationally and agree on such wage rates that make the expected quantity of labour demanded equal to the expected quantity of labour supplied. The determination of money wage rate in the new Keynesian theory of labour market is shown in Figure 3.1.

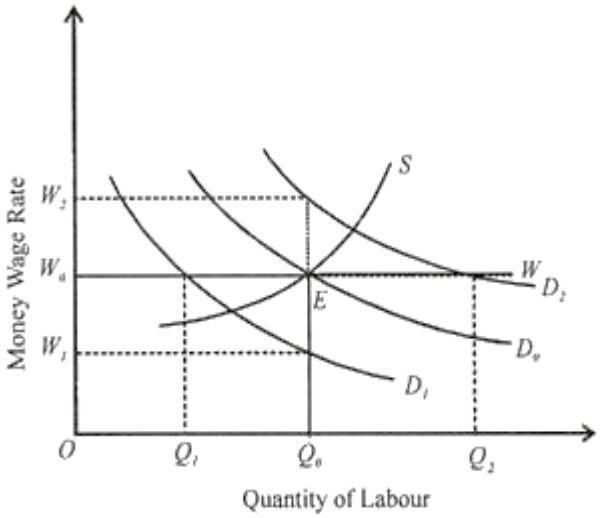

Fig.3.1. Sticky Nominal Wages

During the period of the contract, the effective supply of labour is the horizontal line W_0W which shows the agreed wage rate of OW_0. Workers agree

to supply the quantity of labour which the firms demand at this contracted wage rate. In the figure, S is the expected supply curve of labour and D_0 is the expected demand curve for labour. These curves meet at point E on the agreed money wage rate OW_0 where the expected labour employed is OQ_0. If the demand for labour happens to be more than expected at D_2, the quantity of labour employed increases to OQ_2. If the demand for labour happens to be D_1, the labour employed falls to OQ_1.

The above analysis shows that the quantity of labour employed depends on the expected demand for labour. The expected demand for labour is determined by the expected price level and expected forecasts about the marginal product of labour (MP_L). MP_L, in turn, determines the quantity of labour which the firms will employ at each possible real wage rate. Similarly the expected supply of labour is also based on the expected price level and on expectations about the number of workers available for work at different real wage rates. Suppose the price level rises or the marginal product of labour increases. These increases will shift the demand for labour curve to the right from D_0 to D_2 and equivalently the money wage rate that firms are willing to pay for that employment level. So the quantity of labour employed increases to OQ_2 from OQ_0 and money wage rate from OW_0 to OW_2 In the opposite case with a fall in the price level or decrease in the marginal product of labour, the demand for labour, curve will shift to the left from D_0 to D_1 and equivalently the money wage rate will be reduced from OW_0 to OW_1. The firms will reduce the quantity of labour employed from OQ_0 to OQ_1. In the above analysis, when the price level rises or falls by say 50%, the money wage rate also declines or increases by 50%, the agreed money wage rate OW_0 remains the same. It is only when the demand for labour happens to be the same as expected at D_0 that the level of employment is equal to its expected level of OQ_0. However, under gradually increasing wage rates, workers who stick to their jobs for a long time in the same firm get less than the value of their marginal product as they approach retirement. But over the long period, they are paid wages on the average equal to the value of their marginal product.

Staggered Wage Contracts Theory:

One of the theories of nominal wage rigidities in the new Keynesian analysis is of staggered contracts. In the staggered contracts approach, not

all labour unions sign contracts at the same time. There is no synchronization of contracts. Contracts are renewed at various times so that the dates on which new contracts start are staggered and they overlap. Such overlapping long-term wage contracts lead to nominal wage rigidity. During the contract period, the wage rate is fixed and linked to the expected rate of inflation by price indexing. If prices are expected too high, workers will demand larger wage increases and firms will be willing to pay them because their own prices are expected to rise. Besides expectations of inflation, wage fixation is influenced by expectations of wages paid to other workers and the level of employment. Taylor in his staggered contract approach takes aggregate nominal demand indexation as a source of nominal wage rigidity. He assumes the nominal wage fixed over the period of the contract at a level that depends on the expected price and expected future demand and output. A monetary disturbance affects demand and output during the period of contract until a new contract is negotiated. Suppose the monetary authorities reduce the money supply in the economy which reduces aggregate demand and output. This requires a proportionate adjustment in nominal wages to maintain full employment. Since the wage contracts are staggered, wage adjustment is very slow in response to changes in aggregate demand and output. This makes nominal wages sticky.

2. Mankiw Sticky Prices Model: Menu Costs:

The classical and new classical microeconomic theories are based on the assumption of flexibility of prices where prices clear markets by adjusting demand and supply quickly. New Keynesian economists, on the other hand, believe in the stickiness of prices in the short-run. Markets do not clear quickly because adjusting prices is costly. Frequently adjusting prices of their goods involve costs to firms. A large sector of the economy is made up of price-makers who sell goods in monopolistic or imperfectly competitive markets. For them, adjusting prices is costly. The costs of adjusting prices are called the menu costs. Changing prices requires the use of resources by a firm. It has to print new price lists (menus), catalogues, and other printed material. A super market has to reliable all products and shelves with the new prices. A hotel and a restaurant have to reprint its menu with new prices. Meetings,

phone calls, and trips by representatives of a firm to renegotiate with suppliers, all fall under the category of menu costs.

In the menu costs approach to sticky prices, it is profitable for firms to react to small changes in demand by keeping prices constant over a short period and responding with changes in output. Because of menu costs, firms do not change their prices every time with a change in demand conditions. Menu costs are incurred each time prices are changed periodically rather than continuously. Thus menu costs explain the short-run stickiness of prices.

In the menu cost hypothesis, prices adjust slowly because changes in prices have externalities. When one firm reduces the price of a product, it benefits other firms in the economy. When it reduces the prices it charges, it lowers the average price level slightly and thereby raises real income. The increase in real income, in turn, raises the demand for the products of all firms. This macroeconomic impact of one firm's price adjustment on the demand for the products of all other firms is called an aggregate-demand externality by Mankiw. With aggregate demand externality, small menu costs can make prices sticky.

Assumptions:

The sticky nominal price analysis of menu costs is based on the following assumptions:

1. There is an imperfectly competitive market which consists of a number of monopolistic competitive firms.
2. Firms produce standardized or differentiated products.
3. Firms are price-makers having some control over the prices of their products.
4. Price adjustments involve costs for firms.
5. The demand curves are linear.
6. The marginal cost curve is horizontal.

Explanation: Given these assumptions, we illustrate in Figure 3.2 how menu costs work and affect the adjustment of price and quantity of a firm's product. Let us suppose that the firm's demand has declined so that the original demand curves D_0 shifts to the left to D_1 and correspondingly its original MR_0 curve to MR_1. Similarly its marginal cost has also declined. It has been shown as MC_1 which remains fixed. The original marginal cost curve MC_0 has

not been shown to simplify the figure. The original price is OP_0 and quantity is OQ_0 when MR_0 intersects MC_1 at E.

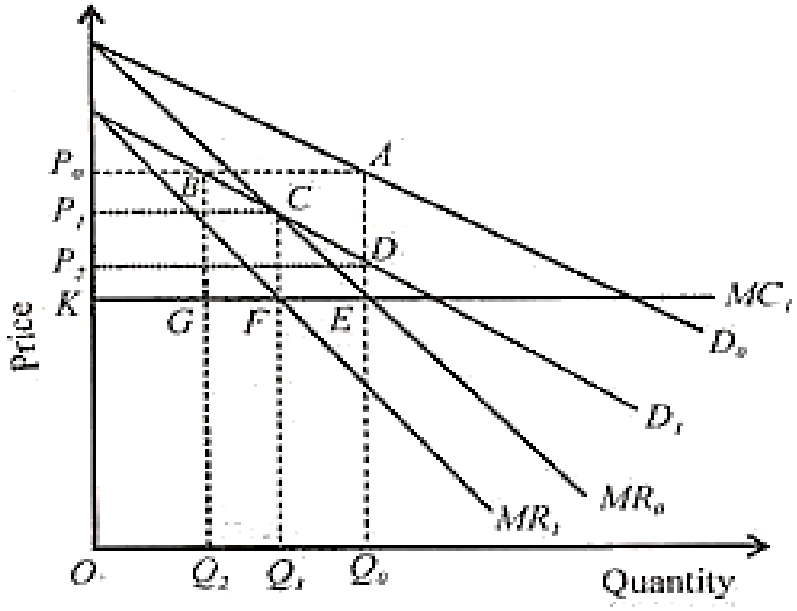

Fig.3.2.

The firm's profit is $KEAP_0$. With the decline in demand, the intersection of MR_1 and MC_1 is at F and the price falls to OP_1 and quantity to OQ_1. Consequently, profit declines to $KFCP_1$. If the menu costs are high, the firm will keep the price at OP_0, reduce output to OQ_2 and earn $KGBP_0$ profit. The firm will reduce price to OP_2 only if the extra profit ($KEDP_2$-$KGBP_0$) exceeds the menu cost. The firm will not, therefore, reduce the price and there will be nominal price rigidity at OP_0.

Criticisms:

The menu costs approach has been criticised on the following grounds:

1. The menu costs approach is defective in that it considers only costs of price adjustment and not costs of output adjustment.
2. This approach assumes that marginal cost moves in proportion with demand. As demand rises or falls, marginal cost also increases or declines in the same proportion. In fact, no firm can assume that its marginal cost will be perfectly correlated with its aggregate demand.
3. This hypothesis tries to explain nominal rigidities in adjustments of the level of prices. But it fails to explain rigidities in adjustments of the rate of change of prices.
4. Critics point out that menu costs are small and have become smaller as computers allow the printing of menus at a small marginal cost.

5. Economists do not agree that menu costs can explain price stickiness in the short run because they are very small. Small menu costs cannot explain recession in the economy.
6. Another flaw is that small menu costs may be important for an individual firm but they are unlikely to affect the economy as a whole.

3. Sticky Real Wages:

In the new classical labour theory, labour market is cleared continuously at the market-clearing real wage rate but it does not explain involuntary unemployment. On the other hand, the new Keynesian theories focus on the real wage rigidity where workers are not paid market-clearing wage and involuntary unemployment exists even in the long run.

There are four main approaches to real wage rigidities. They are:

(a) Asymmetric information model,

(b) Implicit contract theory,

(c) insider-outsider theory, and

(d) Efficiency wage theory.

(A) Asymmetric Information Model:

Asymmetric information is a situation in which some persons have more information about some things than others. This idea that each person has asymmetrical information relative to others was used to develop a labour market model by Grossman and Hart. They assumed that managers know more about the interests of the firm than do the workers. Given this better knowledge, it is possible and profitable for managers to deceive the workers about the real position of the firm. They enter into contracts with workers for employment commitments whereby the firm pays those rigid real wages. However, there is an employment commitment in this model that tends to increase the amount of employment in the firm.

(B) Implicit Contract Theory:

Two American economists, Baily and Azariades, have developed the implicit contract theory. Usually employment contracts between workers and firms are explicit agreements. But often there are other dimensions that are not written in the actual contracts. These dimensions are called implicit contracts. Workers and firms enter into implicit contracts concerning job insurance and income because workers are risk-averse with respect to

income. Workers dislike the risk arising from income and fluctuations of employment more than the firms. Consequently, firms offer workers an implicit contract that is partially an income and job insurance contract and partially an employment contract. According to Baily and Azariades, such contracts lead to rigidity in real wages that are not affected by fluctuations in business conditions and employment levels during a recession.

(C) Insider and Outsider Theory:

The insider and outsider theory of labour market was developed by A. Lindback and D. Snower. This theory assumes that there are frictions and imperfections in the labour market that act to divide it in terms of employment opportunities. Insiders are those workers who already have jobs and outsiders are those who are unemployed in the labour market. Insiders are represented by unions who have more say in wage bargaining than the outsiders. Unions negotiate the real wage with firms and set it higher than the market-clearing level so that the outsiders are excluded from jobs leading to involuntary unemployment in the presence of fall in aggregate demand. Unions use their bargaining power to negotiate wages through turnover costs. Turnover costs relate to the costs of firing, hiring and retaining of new workers. These costs prevent the firms to employ outsiders in place of insiders. Unions can also prevent the entry of outsiders for jobs threatening strikes and work-to-rule. Insiders can also use these costs against outsiders to achieve a higher negotiated wage than the wage at which the outsiders are prepared to work.

However, unions can raise the real wage only up to a certain level because if the real wage is higher than the capacity of the firms to pay, less insiders will be employed, if the aggregate demand falls in the economy.

This theory also explains the persistence of involuntary unemployment if the real wage is set very high above the market-clearing level. This is called hysteresis. In times of high involuntary unemployment in a recession, the insiders may use their bargaining power to prevent outsiders form entering into the labour force. Those who become outsiders may lose their influence on wage bargaining contracts because they are no longer union members. Moreover, with persistence involuntary unemployment, it becomes difficult for the long-term unemployed workers to work because their skills have deteriorated. Under the circumstances, a long- period of high involuntary

unemployment will tend to become locked-in. This is the hysteresis effect. When outsiders cannot enter the labour market, the hysteresis effect leads to wage stickiness.

(D) Efficiency Wage Theories:

In new Keynesian economics, payment of efficiency wages leads to real wage rigidity and the failure of market-clearing mechanism. High wages increase efficiency and productivity of workers. Despite an excess supply of labour, firms do not cut wages even though such a move would increase their profits. Firms also do not cut wages because it would lower productivity and raise costs. So it is in the interest of firms to set the real wage above the market-clearing level. Such a wage is called the efficiency wage.

There are **three efficiency wage theories** which are explained below:

1. Turnover Costs Theory:

According to this theory, the real wage is set to minimise turnover costs of firms. Turnover costs include the costs of firing and hiring workers, and training of new workers. It is profitable for firms of reduce such costs. By paying high real wages above the market-clearing wage, firms can prevent experienced and efficient workers from leaving the firm to join other firms. It can also reduce recruiting costs to replace such workers and costs of training new workers.

2. Selection Theory:

Firms do not know the quality of workers at the time of selection. Firms have imperfect information about potential workers at the time of hiring them. Selection procedures being costly, firms always try to select higher quality workers. Good quality workers have a higher reservation (minimum) wage than low quality workers. If a firm pays below the reservation wage, it will not attract good quality workers. By paying a wage higher than the reservation wage, the firm will attract better quality workers. By paying a higher wage, the firm avoids adverse selection (i.e., does not hire low quality workers and reduce productivity of the firm), improves the average quality of workers and increases its productivity. Thus it is advantageous for firms to pay the efficiency wage above the market-clearing wage.

3. The Shirking Theory:

The shirking theory is based on the premise that firms cannot easily monitor the work effort of workers and that workers themselves decide how hard to work. Two options are available to a worker: shirking and no-shirking. Shirking workers if caught by the management are fired (dismissed). Workers know that if fired, they are not likely to get employment immediately at the existing wage. The firm can encourage workers not to shirk work by paying a higher wage. Thus a wage at which no-shirking occurs is an efficiency wage. Such a wage is an employment cost to workers of being fired. Having a job at a higher wage is advantageous to them than being unemployed. So a higher wage is an inducement to workers not to shirk.

Assumptions:

This theory is based on the following assumptions:

1. Workers either have jobs or are unemployed.
2. Those workers who shirk work are fired.
3. The fired workers do not find employment immediately and remain unemployed for some time.
4. Those workers who receive the efficiency wage do not shirk.
5. There is always unemployment in the labour market at the efficiency wage.

Explanation:

Given these assumptions, this efficiency wage theory is explained in Figure 3.3. Where S is labour supply curve and D is the labour demand curve. These curves meet at point E where OL workers are employed in the firm who are working at OW wage rate. The labour demand curve assumes that these workers do not shirk work. But the management finds that some workers shirk work.

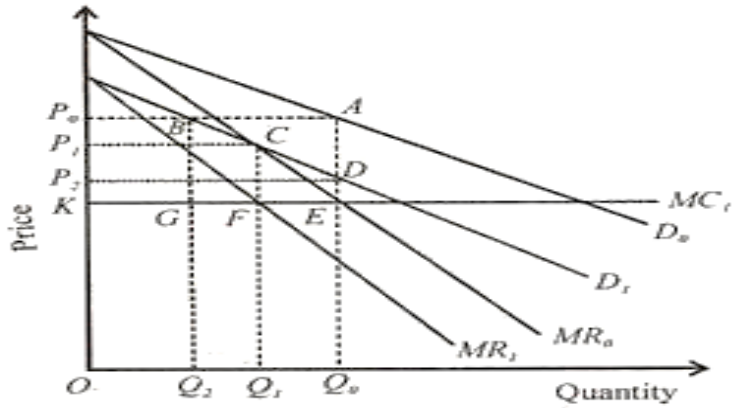

Fig.3.3.

So they are fired and are unemployed. Since the firm has incurred cost of recruitment and training of some workers, it will ensure that they do not shirk. For this, it pays a higher wage to them which is the no- shirking or efficiency wage. Workers not to shirk. In the figure Ns is the no-shirking labour supply curve which intersects. At this wage, there is always the threat of being fired and becoming unemployed. This induces the labour demand curve at point E_1. OW_1 is the efficiency wage at which OL_1 workers are employed and LL_1 workers remain unemployed who are fired for shirking. The efficiency wage OW_1 is above the market-clearing wage OW.

4. Coordination Failure:

New Keynesian theories of wage and price stickiness have inconsistencies because they neglect constraints and spill overs and focus on single markets, one at a time, in a partial equilibrium framework. Cooper and John show that spill overs and strategic complementarities lead to coordination failure. The term 'strategic complementarities' represents a situation in which the optimal decision of one firm is positively dependent on the decision of the other firm. Strategic complementarities are a necessary condition for certain kinds of multiple equilibrium that lead to coordination failure and to aggregate fluctuations. Coordination failure arises when firms and unions try to fix prices and wages to anticipate the actions of other price and wage setters. If there is a change in nominal demand, no firm will have an incentive to change its price exactly in the same proportion unless it believes that other firms will do so immediately. Similarly, union's bargaining for wages will be concerned about the wages other unions may negotiate. But such settings of prices and wages are not possible and they lead to coordination failure. Suppose there are two firms A and B producing potentially related goods whose demand falls. Each firm has to decide how much price it should cut so as to maximise its profit. The decision to cut its price and profit more would depend on the decision made by the other firm. But the price strategy chosen by one firm is not known to the other firm. This is a duopoly game where each firm has the option of earning more profit or less profit by a price cut or no price cut when demand falls and recession starts.

Table 1.1 shows the strategy followed by each firm in terms of expected profit when it expects the other to make a move about the price. If both firms do not cut their prices in the face of reduced demand, each makes a profit of $20 million and recession starts.

Table1.1.Pay-off Matrix in $ Million

		B's Strategy	
		Price cut ↓	No Price cut ↓
A's Strategy	Price cut →	[50] 50	[10] 20
	No Price cut →	[20] 10	[20] 20

Note : Figures in squares relate to Firm A

If both firms cut their prices, each earns a high profit of $50 million and the recession is averted. But if firm A cuts its price, it earns a low profit of $ 10 million and if firm B does not cut its price, it earns a high profit of $20 million. In this situation, by cutting its price, firm A has improved the position of firm B, which can avoid recession and earn a high profit. This is due to an aggregate demand externality. Now suppose if firm A expects that firm B will cut its price, it will also cut its price and both will earn the highest profit of $50. Both are able to avert the recession. But if each firm expects the other to maintain the same price, each will earn $20 million, the recession will continue. All these situations lead to multiple equilibrium. However, the last outcome when each firm earns $20 million is due to coordination failure.

3.3. New Keynesian Business Cycle Theory

J.M. Keynes in his seminal work 'General Theory of Employment, Interest and Money' made an important contribution to the analysis of the causes of business cycles. According to Keynes theory, in the short run, the level of income, output or employment is determined by the level of aggregate effective demand.

In a free private enterprise, the entrepreneurs will produce that much of goods as can be sold profitably. Now, if the aggregate demand is large, that is, if the expenditure on goods and services is large, the entrepreneurs will be able to sell profitably a large quantity of goods and therefore they will produce more.

In order to produce more they will employ a larger amount of resources, both men and materials. In short, a higher level of aggregate demand will result in greater output, income and employment. On the other hand, if the level of aggregate demand is low, smaller amount of goods and services can be sold profitably.

This means that the total quantity of national output produced will be small. And a small output can be produced with a small amount of resources. As a result, there will be unemployment of resources, both labour and capital. Hence, the changes in the level of aggregate effective demand will bring about fluctuations in the level of income, output and employment.

Thus, according to Keynes, the fluctuations in economic activity are due to the fluctuations in aggregate effective demand. Fall in aggregate effective demand will create the conditions of recession or depression. If the aggregate demand is increasing, economic expansion will take place.

What causes fluctuations in aggregate demand? The aggregate demand is composed of demand for consumption goods and demand for investment goods. Thus aggregate demand depends on the total expenditure of the consumers on consumption goods and entrepreneurs on investment goods.

Propensity to consume being more or less stable in the short run, fluctuations in aggregate demand depend primarily upon the fluctuations in investment demand. Keynes shows that the fundamental cause of fluctuations in aggregate demand and hence in fluctuations in economic activity is the fluctuations in investment demand. Investment demand is very unstable and volatile and brings about business cycles in the economy.

Let us start from the phase of economic expansion to explain Keynes's theory of business cycles. We first explain how in Keynesian theory expansion comes to end and recession or depression sets in. During an economic expansion two factors eventually work to cause investment to fall.

First, during the expansion phase increase in demand for capital goods due to large-scale investment activity leads to the rise in prices of capital goods due to rising marginal cost of their production. Higher prices of capital goods raise the cost of investment projects and thereby reduce marginal efficiency of capital (that is, expected rate of return).

Secondly, as income rises during expansion phase, the demand for money increases which raises interest rate. Higher interest rate makes some potential, projects unprofitable. Thus, fall in marginal efficiency of capital on the one hand and rise in interest rate on the other cause decline in investment demand. Declining trend of investment, according to Keynes, raises doubts about the prospective yield on capital goods which is more important factor determining marginal efficiency of capital than cost of investment projects and rate of interest. When among businessmen pessimism sets in about future profitability of investment projects stock prices tumble.

The crash in stock prices worsens the situation and causes investment to fall even more. Besides, fall in prices of shares reduces wealth of households. Wealth, according to Keynes, is an important factor determining consumption. Thus, the decline in stock prices reduces autonomous consumption demand of households. With the fall in both investment and consumption demand aggregate demand declines which result in accumulation of unintended inventories with the firms. This induces the firms to cut production of goods.

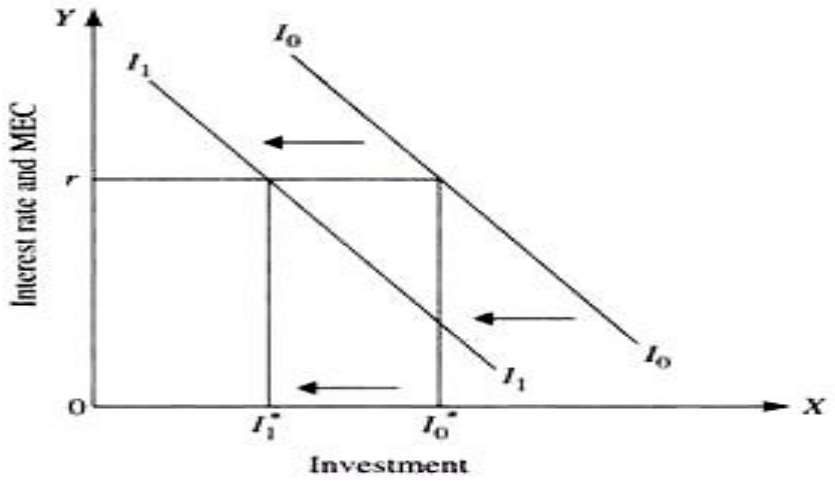

Fig.3.4. A decline in investment expenditure due to fall in marginal efficiency of capital

It follows from above that besides the rise in cost of capital goods and rise in rate of interest towards the end of the expansion phase, it is the fall in expected prospective yield that reduces the marginal efficiency of capital and causes investment demand to fall. This induces a wave of pessimistic expectations among businessmen and speculators. These pessimistic

expectations cause stock prices to tumble which work like adding fuel to the fire. They cause a further fall in the marginal efficiency of capital.

The turning point from expansion to contraction is thus caused by a sudden collapse in marginal efficiency of capital. In terms of graph, a sudden fall in the marginal efficiency of capital causes on leftward shift in the investment demand curve, for example from I_0I_0 to I_1I_1 in Figure 3.4 resuming in decline in investment from I_0* to I_1* at the given rate of interest. Note that decrease in investment does not automatically decrease in rate of interest to offset the fall in the marginal efficiency of capital. However, additional factor that makes Keynes's business cycle theory potent is the working of multiplier which was an important discovery of J.M. Keynes. According to Keynes, a decrease in investment expenditure causes a decline in income which in turn reduces consumption expenditure.

The reduction in consumption expenditure further reduces income and this process of reduction in income continues further. The total fall in income (Ay) due to an initial decline in investment (ΔI) will be equal to ΔI x 1/1 – MPC where 1/ 1 – MPC is the value of multiplier.

If marginal propensity to consume is 0.75, the multiplier will be equal to 4. Thus, a decline in investment by 100 crores will lead to the decline in income by 400 crores. Note that multiplier here works in reverse. Thus, the multiplier process magnifies the effect of decline in investment expenditure on aggregate demand and income and further deepens the depression. As income and output are falling rapidly under the multiplier effect, the employment also goes tumbling down. Thus, the Keynes theory of income multiplier plays a significant role in causing magnified changes in income, output and employment following a reduction in investment.

It is important to note that, in Keynes's views, wages and prices are not flexible enough to offset the decline in investment expenditure and thereby restore full employment. This is in sharp contrast to the classical theory where changes in wages and prices ensure continuous full employment. In Keynes model wages and prices are "sticky" downward which implies that though wages and prices do not remain constant but when demand falls wages and prices will fall but not sufficient to restore full employment in the economy.

Since wage and price flexibility does not ensure the recovery of the economy out of the state of depression, Keynes thinks that marginal efficiency of capital must rise to stimulate investment. During depression investment falls to a very low level, capital stock begins to wear out and requires replacement.

Further, some existing capital equipment becomes technologically obsolete and has to be abandoned. This generates demand for replacement investment.

A long period of time is necessary for existing capital to depreciate because most capital goods are durable as well as irreversible. By durability of capital goods we mean that they last for a long time and by irreversibility we mean that they cannot be used for purposes other than those for which they are meant. Thus, just as the collapse of marginal efficiency of capital is the main cause of the upper turning point, similarly the lower turning point, i.e., changes from recession to recovery is due to the revival of the marginal efficiency of capital, that is, expected rate of profit.

Restoration of business confidence is the most important, yet the most difficult factor to achieve. Even if the rate of interest is reduced, the investment will not increase. This is because of the fact that in the absence of confidence the profitability of investment may remain so low that no practicable reduction in the rate of interest will stimulate investment.

The interval which will elapse between the upper turning point and the start of recovery is conditioned by two factors:

(i) The time necessary for wearing out of durable capital assets, and

(ii) The time required to absorb the excess stocks of goods left over from the boom.

Just as the expected rate of profit was pushed down by the growing abundance of capital during the period of boom, similarly as the stocks of capital goods are depleted and there grows a scarcity of capital goods, then the expected rate of profit rises thereby inducing the businessmen to invest more. When the level of investment increases, income increases by a magnified amount due to the multiplier effect. So the cumulative process starts upward.

Thus, over time as depreciation of capital stock occurs without replacement and also some existing capital equipment becomes technologically obsolete, the size of capital stock declines. New investment must be undertaken even

to produce reduced depression level of output. Thus with the emergence of scarcity of capital, marginal efficiency of capital rises which boosts investment.

Once investment increases, it induces further rise in income and consumption demand through the multiplier process. Now, the multiplier works to magnify the effect of increase in investment on raising aggregate demand. The mood of businessmen changes from pessimism to optimism which drives up stock prices. All these factors work to lift the economy out of depression and puts it on the road to prosperity.

However, it is noteworthy that the recovery process from depression takes a very long me. Keynes argued that Government should not wait for long for the natural recovery to occur. This is because persistence of depression creates a lot of human sufferings. He, therefore, advocated for the active intervention by the Government to raise aggregate through fiscal policy that is, stepping up its expenditure or reducing taxes. Thus, he argued for the adoption of policy of deficit budget to boost aggregate demand so that economy is lifted out of depression.

It may be noted that Keynes' business cycle theory is self-generating. In it the economy passes through a long phase of expansion. But eventually some forces automatically work for example, the growing abundance of capital stock, which reduces marginal efficiency of capital.

Pessimistic overtakes businessmen. This causes reduction in investment which is responsible for bringing about downswing in the economy. The idea that it is the fluctuations in investment that bring about- the fluctuations in the level of economic activity is an important contribution made by Keynes.

Of course, even before Keynes, it was believed that the fluctuations in the investment demand have something to do with the business cycles, but a systematic exposition was lacking. Keynes propounded a definite relationship between a change in investment and the resulting change in income and employment. This relationship is embodied in his famous theory of multiplier.

The Critical Appraisal of Keynes' Theory:

J.M. Keynes has made three important contributions to the business cycle theory. First, it is fluctuations in investment that cause changes in aggregate

demand which bring about changes in economic activity (i.e., income, output, and employment).

Secondly, fluctuations in investment demand are caused by changes in expectations of businessmen regarding making of profits (that is, marginal efficiency of capital). Thirdly, Keynes put forward an important theory of multiplier which tells us how changes in investment bring about magnified changes in the level of income and employment.

But the Keynesian theory of multiplier alone does not offer a full and satisfactory explanation of the trade cycles. A basic feature of the trade cycle is its cumulative character both on the upswing as well as on the downswing i.e., once economic activity starts rising or falling, it gathers momentum and for a time feeds on itself. Thus, what we have to explain is the cumulative character of economic fluctuations.

The theory of multiplier alone does not prove adequate for this task. For example, suppose that investment rises by 100 rupees and that the magnitude of multiplier is 4. From the theory of multiplier we know that national income will rise by 400 and if multiplier is the only force at work that will be the end of the matter, with the economy reaching a new stable equilibrium at a higher level of national income. But in real life this is not likely to be so, for a rise in income produced by a given rise in investment will have further repercussions in the economy. This reaction is described in the principle of the accelerator. According to the principle of acceleration, a change in national income will tend to induce changes in the rate of investment. While multiplier refers to the change in income as a result of change in investment, the acceleration principle describes the relationship between changes in investment as a result of change in income.

In the above example, when income has risen by 400 rupees, people's spending power has risen by an equivalent amount. This will induce them to spend more on goods and services. When the demand for goods rises, initially this will be met by overworking the existing plant and machinery. All this leads to an increase in profits with the result that businessmen will be induced to expand their productive capacity and will install new plants, i.e., they will invest more than before. Thus, a rise in income leads to a further induced increase in investment. The accelerator describes this relation

between an increase in income and the resulting increase in investment. Thus, Samuelson combined the accelerator principle with the multiplier and showed that the interaction between the two can bring about cyclical fluctuations in economic activity.

3.4. Policy Implications of New Keynesian Macro Economics

Some of the main policy implications of new Keynesian economics are as follows: 1. Monetary and Fiscal Policies 2. Prices and Incomes Policies 3. Government and Corporate Policies 4. Re-establishment of Policy Effectiveness 5. Favour Rough or Coarse Tuning 6. Existence of Involuntary Unemployment.

1. Monetary and Fiscal Policies:

The adherents of new Keynesian economics do not hold a unified view of economic policy because of its different strands. They base their models/theories on the real world imperfectly competitive markets with asymmetrical information where wages and prices are sticky. These lead to decrease in demand, economy-wide market failures, recessions and existence of involuntary unemployment.

The main elements of new Keynesian economics comprising menu costs, staggered contracts, coordination failures and efficiency wages are substantial departures from the market clearing assumption of new classical economics. So new Keynesian economics provides a rational for government intervention in the form of active monetary and fiscal policies to prevent recessions and fall in output and employment.

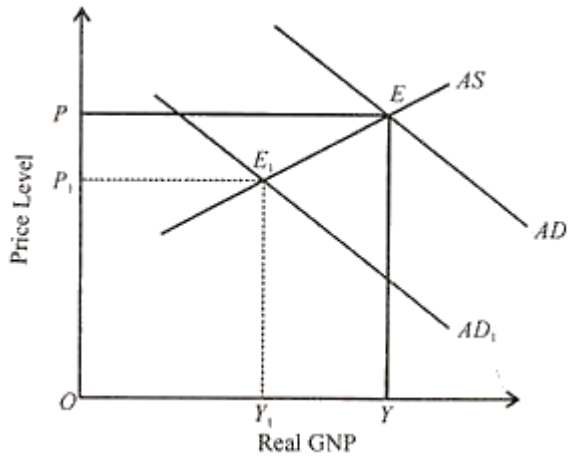

Fig.3.5.

When there is decrease in aggregate demand due to sticky wages and contracts, how stabilisation policy can be used to overcome a recession. This is illustrated in Figure 3.5. It is assumed that:

- The economy is at full employment level,
- Unions and firms have rational expectations, and
- Aggregate demand decreases after wage contracts, based on these expectations, have been signed and before they are renewed.

In the figure, AD is the aggregate demand and AS is the aggregate supply curve. They meet at point E which is the full employment level where OY is the real GNP and OP is the price level. A decrease in aggregate demand due to sticky wages and prices shifts the aggregate demand and curve leftwards to AD_1 which intersects the as curve at E_1. This brings a fall in real GNP to OY_1 and the price to OP_1 leading to a recession. When active monetary and fiscal policies are used, the aggregate demand increases to ad and the economy returns to the full employment level e with the rise in real GNP to OY and price level to OP. Stiglitz favours discretionary monetary and fiscal policies because changing economic circumstances require changes in economic policy. According to him, "If the employment rate becomes high, government must and will do something regardless of what is said."

2. Prices and Incomes Policies:

New Keynesian theory also provides for prices and incomes agreements between firms and unions. In the new Keynesian theory, asymmetries and imperfections in labour market tend to divide the market in terms of employment opportunities. Such imperfections lead to involuntary unemployment. To overcome this problem, prices and incomes policies can increase the power of outsiders in relation to insiders by reducing the effect of market imperfections and limit the use of insider's power thereby reducing unemployment of outsiders.

3. Government and Corporate Policies:

Another important implication relates to corporate and government policies when involuntary unemployment persists in the long run after an adverse employment shock. This is called hysteresis or lagged effects. In times of high involuntary unemployment in a recession, the insiders may use their bargaining power to prevent outsiders from entering the labour force. Those

who become outsiders lose their influence on wage bargaining contracts because they are no longer union members. In such a situation, a long period of high involuntary unemployment will tend to be locked-in. When outsiders cannot enter the labour market, unemployment among them cannot exert pressure on wages which remain sticky.

(i) Institutional Reforms:

Lind-back and Snower have suggested a greater role of the government in the bargaining process by centralization of wage bargaining to reduce the power of insiders and to attract outsiders. For this, the government should soften the job security legislation in order to reduce the costs of hiring and firing of workers. It should also reform industrial relations to reduce the frequency of strikes.

(ii) Reform of Benefits System:

To provide more-employment opportunities to outsiders, the benefits system should be reformed so that the unemployed workers do not depend too much on unemployment insurance, social insurance or 'dole' because such a system encourages workers to shirk jobs. Moreover, efforts should be made to increase labour mobility through efficient employment exchanges and employment bureaus.

(iii) Organisational Changes:

Corporations should make organisational changes to increase the power of outsiders by introducing on-the-job training and profit-sharing schemes for workers. By such measures, high involuntary unemployment may persist for a short period.

4. Re-establishment of Policy Effectiveness:

New Keynesian theories which emphasise price and wage stickiness, re-establish non-neutrality of money and policy effectiveness. Fisher and Phelps and Taylor have shown that nominal demand disturbances produce real effects in theories that incorporate rational expectations when market-clearing assumption is abandoned.

In such theories, monetary policy can help in stabilising the economy. Thus new Keynesian economics re-establishes monetary policy effectiveness as against the policy ineffectiveness of the new classical macroeconomics.

5. Favour Rough or Coarse Tuning:

Monetarists and new classical economists undermined the case for fine-tuning the economy by making frequent changes in monetary and/or fiscal policy to keep GNP at, or near, its full employment level. But new Keynesian economists favour 'rough' or 'coarse' tuning where monetary and fiscal policies are used to correct or avoid only large deviations from potential GNP.

6. Existence of Involuntary Unemployment:

As against the new classical approach, new Keynesian economists have maintained the existence of involuntary unemployment equilibrium. For example, in efficiency wage models, firms do not cut wages even when there is an excess supply of labour due to persistent unemployment because such a policy would lead to lower efficiency and productivity.

3.5. Conclusion

The New Keynesian School attempts to add microeconomic foundations to traditional Keynesian economic theories. This school of thought includes economists like George Akerlof, David Romer, Olivier Blanchard, and Greg Mankiw. They do not believe that markets clear, but explain why the market fail to clear. They argue that wages and prices are neither rigid nor flexible. They adjust slowly to the shocks. Due to "menu costs", "aggregate demand externalities", and "coordination failure", wages and prices adjust slowly, and even sometimes sticky. Menu costs are the cost to the firm for changing prices and wages. If it is costly for the firm to change the prices they charge and the wages they pay, both wages and price will adjust slowly. Hence, economy wide wage level and price level will not be flexible to adjust to the period of shocks. Aggregate demand externalities include the impact of one firm's price change on the demand for all other firm's product. When one firm lowers the price it charges, it lowers the economy wide average price level, raising the real money balances, and hence the demand for other firms rises. Thus, it is a positive externality to other firms, and hence they are reluctant to reduce their prices, making prices and wages sticky. The problem of coordination failure arises because the leaders, who set the prices, are unable to anticipate the actions of other firms. Similarly, labour unions, which set wages, are unable to see the benefits to other labour unions.

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UNIT - IV

OPEN ECONOMY MACRO ECONOMICS

4.1. Introduction

An open economy is one which interacts with other countries through various channels. So far we had not considered this aspect and just limited to a closed economy in which there are no linkages with the rest of the world in order to simplify our analysis and explain the basic macroeconomic mechanisms. In reality, most modern economies are open. There are three ways in which these linkages are established.

1. Output Market: An economy can trade in goods and services with other countries. This widens choice in the sense that consumers and producers can choose between domestic and foreign goods.

2. Financial Market: Most often an economy can buy financial assets from other countries. This gives investors the opportunity to choose between domestic and foreign assets.

3. Labour Market: Firms can choose where to locate production and workers to choose where to work. There are various immigration laws which restrict the movement of labour between countries.

Movement of goods has traditionally been seen as a substitute for the movement of labour. We focus on the first two linkages. Thus, an open economy is said to be one that trades with other nations in goods and services and most often, also in financial assets. Indians for instance, can consume products which are produced around the world and some of the products from India are exported to other countries. Foreign trade, therefore, influences Indian aggregate demand in two ways. First, when Indians buy foreign goods, this spending escapes as a leakage from the circular flow of income decreasing aggregate demand. Second, our exports to foreigners enter as an injection into the circular flow, increasing aggregate demand for goods produced within the domestic economy. When goods move across national borders, money must be used for the transactions. At the international level there is no single currency that is issued by a single bank. Foreign economic agents will accept a national currency only if they are convinced that the amount of goods they can buy with a certain amount of that currency will not change frequently. In other words, the currency will maintain a stable purchasing power. Without

this confidence, a currency will not be used as an international medium of exchange and unit of account since there is no international authority with the power to force the use of a particular currency in international transactions. In the past, governments have tried to gain confidence of potential users by announcing that the national currency will be freely convertible at a fixed price into another asset. Also, the issuing authority will have no control over the value of that asset into which the currency can be converted. This other asset most often has been gold, or other national currencies. There are two aspects of this commitment that has affected its credibility the ability to convert freely in unlimited amounts and the price at which this conversion takes place. The international monetary system has been set up to handle these issues and ensure stability in international transactions. With the increase in the volume of transactions, gold ceased to be the asset into which national currencies could be converted. Although some national currencies have international acceptability, what is important in transactions between two countries is the currency in which the trade occurs. For instance, if an Indian wants to buy a good made in America, she would need dollars to complete the transaction. If the price of the good is ten dollars, she would need to know how much it would cost her in Indian rupees. That is, she will need to know the price of dollar in terms of rupees. The price of one currency in terms of another currency is known as the foreign exchange rate or simply the exchange rate.

4.2. Openness in goods in financial market

In this era of globalization, almost all economies are open to international trade and financial flows in varying degrees. International trade provides consumers and firms the freedom to choose from a diverse range of goods and services produced within the country and abroad. In a globalized world, the investors can also choose between domestic and foreign assets. Although restrictions on international trade and financial flows still exist in the form of taxes, tariffs, controls on labor and capital movement, their levels have been going down significantly in recent years. In India, prior to 1991 the economy was heavily regulated, with numerous trade restrictions and capital controls limiting the degree of openness of the economy. With the reforms of 1991, the economic situation has changed dramatically. There has been an

increase in the degree of openness of the economy as is evident from various measures of openness. These measures are discussed in the next section.

4.2.1. Measures of Openness of an Economy

Openness of an economy refers to the degree of freedom to exchange goods and factor services (capital and labor) across national boundaries. The greater is this freedom, the more open the economy. In recent years, with globalization there has been greater integration of all major economies with the rest of the world. As a result, the proportion of trade to world GDP has been rising. It would be of value to measure how open an economy is. Some of the measures that could be used are:

1. Share of foreign Trade: It is the sum of exports and imports of a country expressed as a proportion of its GDP. This is most widely used as an indicator of degree of openness of a country.

2. Value of import duties as a proportion of value of imports: This is often used as a measure of openness. A fall in this ratio indicates lower import restrictions and hence suggests that the economy is more open. These are two measures of the extent of openness of an economy on the current account. An open economy also engages in purchase and sales of financial assets (capital inflows and outflows on the capital account). Measures similar to 1 and 2 listed above have been suggested that try to capture openness on capital account by the value of capital (asset) transactions as a proportion of GDP. Some indices attempt to measure the stringency of restrictions on cross border financial flows. The foreign currency of another nation that is required for international transactions is called foreign exchange. Countries earn foreign exchange by exporting and use it up in buying imports. The trade balance of a nation is the difference between exports to foreigners and imports from them. A nation will have a positive balance or trade surplus if exports exceed its imports; and, it will have negative balance or trade deficit if its imports are greater than exports. We will discuss about the Balance of Payments of countries. In the case of trade surplus or deficit, one of the nations has to make payments to the other nation in the foreign currency or ask for credit. Since all these transactions across international borders involve the use of foreign exchange, it is extremely useful to understand the

concept of exchange rates between different currencies. The concept of exchange rate is discussed in the following section.

4.3. Exchange Rate: Definition & Concepts

The exchange rate between currencies can be defined as the number of units of domestic currency (rupee) required to purchase one unit of foreign currency (dollar). For example, if Rs. 60 is required to buy a dollar, then the exchange rate is $1 = Rs. 60. Similarly, the exchange rate of the Indian rupee can be defined in terms of all other currencies such as yen, euro, pound etc. It is important to know about changes in values of exchange rates. When the exchange rate changes from $1 = Rs. 60 to $1 = Rs. 55, the foreign currency gets cheaper. It costs less (Rs. 55) to buy one dollar compared to the earlier case when the price of dollar was higher in terms of rupee (Rs. 60). In this case we say that rupee has appreciated vis-a-vis dollar. Note, in this case, dollar has depreciated vis-a-vis rupee. One dollar now buys less (Rs. 55) in terms of rupees compared to the earlier situation when it bought more (Rs. 60). A country's currency could appreciate or depreciate due to various reasons linked with macroeconomic phenomena such as inflation, interest rates or Balance of Payments position etc. We will have more to say on these in the subsequent Modules.

4.3.1. Nominal Exchange Rates:

The concept of exchange rate discussed above is referred to as the nominal exchange rate between dollar and rupee. Let us denote this by e. That is, e is the price of foreign currency (dollar) in terms of the domestic currency (rupee).Continuous changes take place in the nominal exchange rate (e) when exchange rates are freely floating and their value is determined by the relative demand and supply of domestic and foreign currency. When the nominal exchange rate (e) rises (say, from $1 = Rs. 60 it becomes, $1 = Rs.65), there is an increase in the price of foreign currency (dollar) in terms of the domestic currency (rupee) and there is a nominal depreciation of the domestic currency (rupee).When e falls (say, from $1 = Rs. 60 it becomes, $1 = Rs. 55) there is a fall in the price of foreign currency (dollar) in terms of domestic currency (rupee), and there is a nominal appreciation of the domestic currency (rupee). In many cases, exchange rates are not freely floating but are fixed by the government. In a fixed exchange rate system, two or more countries maintain

a fixed parity or constant exchange rate between their currencies over a period of time. The fixed parity is often revised from time to time. The counterparts of appreciation and depreciation under the fixed exchange rate system are referred to as revaluation and devaluation. Thus, in a fixed exchange rate system, decrease in e due to official intervention is called revaluation while an increase in e by official intervention is called devaluation. You will get a clearer idea about exchange rate determination in subsequent Modules. For now, it is important to understand these definitions and concepts.

4.3.2. Real Exchange Rate:

In open economies, we are also interested in measuring the rate at which the domestic goods can be exchanged for foreign goods. This can be measured by computing real exchange rates. It is called 'real' because it refers to commodity-commodity exchange rather than currency-currency exchange as in the nominal exchange rate. Thus, the price of foreign goods relative to that of domestic goods is referred to as the real exchange rate. This is not directly observable, but can be easily constructed using information on prices of a basket of domestic and foreign goods and on nominal exchange rates that are readily available.

Why are real exchange rates useful? To an Indian importer, it is of great relevance to know how much goods he can buy from the U.S., which depends on the nominal exchange rate as well as on the dollar price of American goods. This information is provided by real exchange rates. The rupee-dollar real exchange rate reflects the relative price of goods produced in U.S. relative to those produced in home country. The prices of a basket of goods are measured using a price index such as the GDP deflator. If P denotes the price index for India and P*that for the U.S., then the real exchange rate, the price of U.S. goods in terms of Indian goods (denoted by R), can be computed as:

$$R = \frac{e\,P^*}{P}$$

In words, the real exchange rate is computed by multiplying the foreign price level by the nominal exchange rate and then dividing by the domestic price level. If real exchange rate is equal to one, then the nominal exchange rate is such that the cost (expressed in terms of a single currency) of a basket of

goods is the same in two countries. In this special case, the nominal exchange rate is said to maintain purchasing power parity. If the real exchange rate is greater than one, then the rupee price of foreign goods is higher than the domestic goods. That is, foreign goods are more costly than Indian goods. In this case, the demand for Indian goods would be higher. In general, an increase in R indicates that Indian goods have become cheaper relative to foreign goods and that should boost our exports. This is why the real exchange rate is often used as an index of a country's international price competitiveness.

Similar to nominal exchange rates, there are continuous movements that take place in real exchange rates. For instance, suppose that P* and P are unchanged and e rises (i.e. rupee depreciates). This would cause a rise in R.A rise (fall) in the real exchange rate i.e. an increase in the relative prices of foreign goods in terms of domestic goods is referred to as real depreciation(real appreciation) of the home currency. When domestic and foreign prices remain unchanged, the nominal and real exchange rates move in the same direction. However, prices may change simultaneously with exchange rates and an appreciation in nominal exchange rates (fall in e), along with a large fall in domestic prices (P falls) may lead to a real depreciation (R rises). In other words, it may happen that real and nominal exchange rates move in opposite directions.

4.3.3. Bilateral and Multilateral Exchange Rates

The discussion till now has focused on bilateral exchange rates, involving only two countries (India and the U.S.). However, India does not trade with only one country. Nor does any country in the world trade and interact with only one country. Due to this fact, the concept of multilateral exchange rate rather than bilateral exchange rate becomes more relevant. The concept of effective exchange rate therefore becomes useful. This is discussed next.

4.3.4. Nominal Effective Exchange Rate (NEER)

It is computed as the weighted average of nominal exchange rates with the weights as the shares of the respective countries in the trade of the home country. An example will clarify. For example, if India trades only with 2 countries (U.S. and U.K. with respective shares of 70% and 30% in India's

trade) and nominal exchange rates are ($1=Rs. 60) and (£1=Rs. 105) then the nominal effective exchange rate (NEER) may be computed as:

NEER = 0.70* 60 + 0.30 *105 = 73.50

This implies that for Rs. 73.50, a basket of goods containing 0.7 dollars and 0.3 pounds can be purchased. It should be noted that while calculating effective exchange rate only the important trading partners with which we have a sizeable proportion of trade are considered. Thus, a 5-country NEER or a 10-country NEER will consider only the top five or top ten trading partners respectively. The effective exchange rate is expressed as an index number. So, like any other index number, it assumes value of 100 in the base year.

4.3.5. Real Effective Exchange Rate (REER)

Instead of computing separate real exchange rates for all the trading partners, it would be useful to compute and track the overall real effective exchange rate (REER) for a country. Similar to NEER, it is computed as the weighted average of RERs of all the major trading partners, the weights being the shares of these countries in India's foreign trade. It indicates the quantity of domestic products that may be given to get one basket of foreign products. Again, only the major trading partners are considered. For example, 5 country REER or a 10 country real effective exchange rate (REER) can be computed using nominal exchange rates and price indices of 5 or 10 countries which are the most important trading partners. (REER) Real Effective Exchange Rate is also usually expressed as an index with value 100 in the base year.

4.4. Exchange Rate Regimes

4.4.1. Fully Flexible Exchange Rate or Clean Floating

When the exchange rate is fully flexible or on a clean float, its value is determined entirely by the demand and supply of foreign exchange. In this case the countries' central banks do not engage in the purchase and sale of foreign currencies, in an attempt to affect the value of the exchange rate and the exchange rate adjusts to equate market demand and supply of foreign exchange. Thus, in the fully flexible or floating rates system, exchange rate adjusts continuously to clear the foreign exchange markets. In this case, the governments have little role to play as they do not intervene to set the exchange rates.

For instance, suppose the exchange rate is $1=Rs. 60 and Indian exports to the U.S. increase due to some reason. Then, the American importers (who have dollars) would need more rupees to pay Indian exporters. In such a case, the demand for rupees and supply of dollars would increase, creating an excess demand for rupees and an excess supply of dollars. If the Indian central bank (Reserve Bank of India or RBI) did not intervene and allowed market demand and supply to determine the new exchange rate, there would be an appreciation of rupee and depreciation of the dollars, resulting in fall in the exchange rate to say $1 = Rs. 55.

To understand how foreign exchange rates are determined it is essential to study the demand and supply of foreign exchange. Let us consider the market for foreign exchange (say dollars) in India. The Indians can buy dollars in exchange of rupees from the foreign exchange market (banks and financial institutions) at times of need. Figure 4.1 displays a market for foreign exchange (dollars). Similar to any demand-supply analysis, the quantity of foreign exchange is shown on the horizontal axis. The price of foreign exchange, i.e. rupee per dollar is represented on the vertical axis. Figure 4.1 displays a market for foreign exchange. The demand for foreign exchange is represented by the demand curve D.

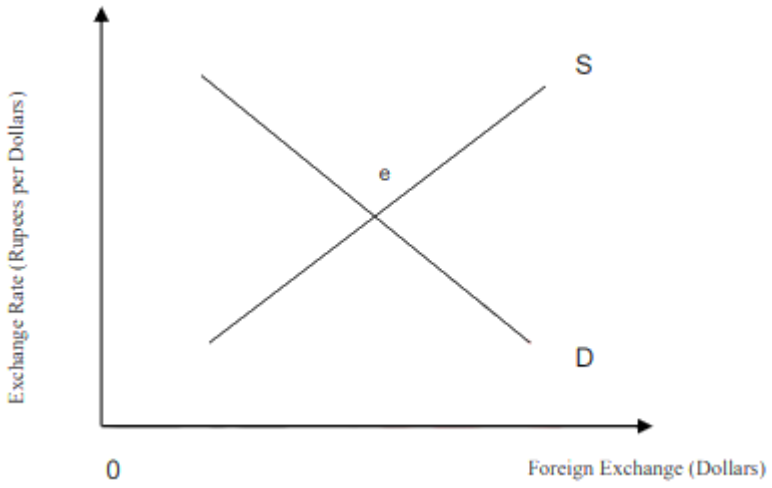

Fig.4.1. the market for foreign exchange

The demand for foreign exchange (dollars) arises out of following transactions:

1. When goods are imported into the domestic economy (India), importers have to pay to foreigners in foreign currency (dollars), creating a demand for dollars.

2. The purchase of assets (e.g. purchase of foreign government bonds or shares in foreign companies) by domestic residents leads to outflow of dollars, again creating demand for dollars.

The supply of foreign exchange (dollars) is represented by the supply curve, S. The supply of foreign exchange (dollars) results from the following transactions:

1. When goods are exported to other countries, exporters receive payments in foreign currency (dollars), resulting in increase in supply of dollars

2. When foreigners purchase domestic assets (e.g. purchase of Indian government bonds or shares in Indian companies), there is an inflow of dollars or increase in supply of dollars

For simplicity, we assume that the asset transactions are exogenous and not influenced by the exchange rates. In such cases, the slope of demand and supply curves may be understood as follows.

Given the prices of foreign goods (imports) and domestic goods (exports), when there is a rise in the exchange rate (or the depreciation of rupee vis-à-vis dollar), exports become cheaper in foreign currency. This leads to an increase in exports and hence an increase in export earnings or supply of foreign exchange (dollars). So the supply curve is positively sloping, as a rise in the exchange rate is associated with increase in supply of foreign exchange.

A rise in the exchange rate (depreciation of rupee vis-a-vis dollar) makes foreign goods (imports) relatively more expensive in domestic currency and reduces demand for imports and hence the demand for foreign exchange. So the demand for foreign exchange is downward sloping as a rise in exchange rate is associated with a fall in demand for foreign exchange.

Figure 4.1 shows how the equilibrium between demand and supply of foreign exchange determines the exchange rate in a system of flexible exchange rate. The equilibrium value is e*. The exchange rate remains at this level until there is some change in either demand or supply. But, there will be a change in the equilibrium exchange rate if there is a change in any of the factors affecting demand and supply. For example, consider an increase in disposable income of Indians. This increases the demand for all products, domestic or foreign and hence has an impact on demand for foreign exchange. This case is demonstrated in Figure 4.2.

The demand curve in Figure 4.2 shifts from D to D1as import demand rises due to increase in disposable incomes. Other things equal, higher import demand leads to an increase in demand for foreign exchange (dollar), creating an excess demand for dollar at the initial exchange rate, e. You may note that the excess demand for dollars, is essentially an excess supply of rupees as people exchange rupee for dollar. This leads to a rise in price of dollars in terms of rupee or a depreciation of rupee vis-a-vis dollar. The foreign exchange market clears as the new equilibrium exchange rate e1 is reached, where once again demand is equal to supply. You may note that at e1 the rupee has depreciated as a result of the increase in import demand (due to increase in disposable incomes of Indians).

Consequent to the shift, the equilibrium exchange rate increases to e1 from its initial level, e. As exchange rate rises, dollar becomes relatively more expensive and, therefore, there will be an increase in exports and reduction in imports. Instead of rise in disposable income of Indians, now suppose the demand for foreign asset rises (resulting in rise in capital outflow from India). Consequently, the demand for dollar will rise causing D to shift to the right.

This is similar to the earlier case of rising disposable income in the domestic economy. The impact on exchange rate, e, is similar. Again, the rupee will depreciate. In the reverse case, when the foreign demand for Indian assets rises (resulting in higher capital inflow into India), supply of dollars in India will go up (the S curve will shift to the right in Figure 4.2) and rupee will appreciate.

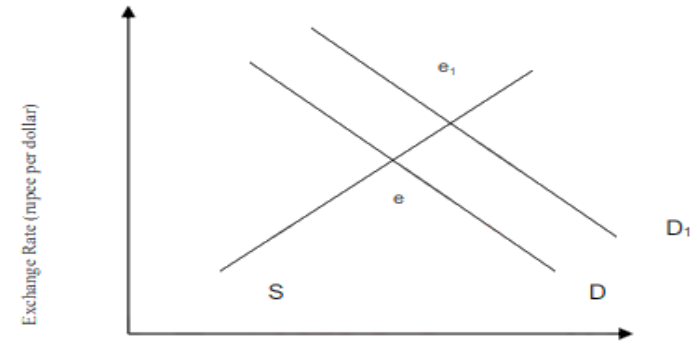

Figure 4.2: Shift in equilibrium exchange rate due to increase in disposable incomes in domestic economy

Floating exchange rates lead to considerable volatility in exchange rates that must change continuously to clear foreign exchange markets. Such volatility may be unfavorable for the interests of exporters and importers. It may also have its adverse impact on domestic production and employment. As such, pure floats are rarely observed and in most countries governments intervene and try to maintain the value of exchange rate within a certain band.

4.4.2. Fixed or Pegged Exchange Rate

An important function of central banks in fixed exchange rate system is to intervene in foreign exchange markets. Intervention is the purchase and sale of foreign exchange by central bank in order to maintain the price of foreign exchange fixed at a pre-announced level. In order to carry out intervention in foreign exchange markets, the central bank has to maintain adequate stock of foreign currency or foreign exchange reserves. You will learn more about the role of the central bank in subsequent Modules.

In a fixed exchange rate system, the central bank announces and supports a fixed exchange rate between two currencies by buying or selling foreign currencies in the foreign exchange market at that particular rate. For instance, in a fixed exchange rate regime if there is an excess supply of rupee and an excess demand for dollar, to prevent a depreciation of the rupee vis-a -vis dollar RBI will sell dollar and buy rupee. It would do so till the excess supply for rupee and excess demand for dollar is eliminated, so that the exchange rate remains fixed. To see this, look at Figure 4.3. The equilibrium exchange rate determined by the demand and supply of foreign exchange is e*. However, if the central bank fixes the exchange rate at e1, then there is an excess supply of dollar in the market.

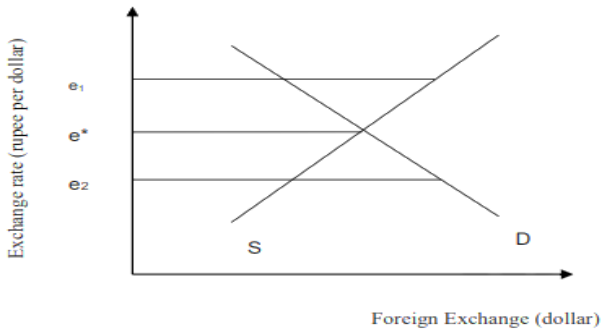

Fig.4.3. Foreign Exchange Market with Fixed Exchange Rate

As the exchange rate is high, Indian goods become relatively cheaper and hence demand for such goods is relatively high, compared to foreign goods. This creates an excess demand for rupees and a corresponding excess supply of dollars. In such a case, the central bank stands ready to buy excess dollar in the market. In the reverse case, when the exchange rate is fixed at e2 then there is an excess demand for dollar. As the exchange rate is relatively low, foreign goods are relatively cheaper. Hence there is excess demand for dollar and corresponding excess supply of rupees. In this case, the central bank stands ready to sell dollar. However, the central bank cannot do this indefinitely as its own stock of dollars (or 'foreign exchange reserves') would be limited. Occasionally, central banks announce a change in the fixed parity. They may either devalue or revalue the domestic currency, depending on the macroeconomic situation. In the case of a devaluation of the rupee, the price of foreign currency increases (e.g. from $1=Rs. 60, the fixed parity becomes $1=Rs. 75); while foreign currency becomes cheaper in the case of revaluation of the rupee. In a world with few restrictions on international transactions in goods and assets, maintaining a fixed exchange rate poses an immense challenge for a country's government. We will discuss this in the subsequent Modules.

4.4.3 Managed or Dirty Floating

In the managed or dirty floating system, the exchange rate is allowed to fluctuate within specified bounds. Thus, it combines elements of both the flexible exchange rates and the fixed exchange rates. In a managed floating system central banks maintain optimal stocks of foreign exchange reserves and they intervene to restore the value of the exchange rates whenever there is a tendency for it to deviate from the desirable range. Given these three exchange rate regimes, the world is still looking for an ideal exchange rate system. An ideal international exchange rate system would be one that enables exchange rate stability, freer international trade, lower inflation and a stable global economy.

With the breakdown of the international fixed exchange rate system in 1971, known as the Bretton Woods System Indian rupee was linked to British pound. In 1975, it was linked to a basket of currencies rather than a single currency to avoid too much volatility. The 1991 reforms also brought an end

to the fixed exchange rate regime in India. Currently, in India the managed float exchange rate system is maintained. Reserve Bank of India intervenes often in the foreign exchange market to maintain stability of exchange rates. The most active intervention was during the global financial crisis of 2008 in which it sold $20.6 billion in the market. Though overtime rupee has depreciated against dollar as well as other major international currencies, under the managed floating system there has been lesser volatility in the Indian exchange markets.

The theory of purchasing power parity (PPP) predicts that the exchange rates between two countries will adjust in the long run in accordance with the price differences in the two countries. This is based on the assumption of free trade and fully flexible exchange rates. In simple terms, it states that the same product will sell at the same price in all countries, excluding the differences in transportation costs. Accordingly, this theory is also referred to as the law of one price.

Suppose you can buy a basket of commodities at Rs. 600 in India and suppose the same basket costs $10 in U.S.A. Then according to the purchasing power parity theory, the rupee-dollars exchange rate should be $10 = Rs.600 or $1 = Rs. 60. Suppose, instead the market exchange rate in such a case is $1 = Rs. 50 or $10 = Rs. 500, then this leaves room for making profits. One could exchange Rs. 500 for ten dollars and buy the basket of commodities in U.S. at Rs. 500 and sell it for Rs. 600 in India, making a profit of Rs. 100. According to the theory of purchasing power parity, such arbitrage opportunities would be exploited, leading to a rise in the demand for dollar (to acquire the cheap American goods) and corresponding supply of rupee. This would lead to a depreciation of the rupee and an appreciation of dollar, pushing the exchange rate from $1=Rs.50 towards $1=Rs.60. Once the latter exchange rate is attained, all arbitrage possibilities would cease to exist.

The purchasing power parity theory does not explain the exchange rates at a particular point or period of time but explains a long-run tendency for exchange rates to settle at values that reflect goods prices. The inability of PPP to be hold in the short run could be explained by the existence of restrictions such as natural barriers (e.g. transportation) or trade controls (e.g. tariffs, quotas) across countries and non-comparable products that are sold across

countries. Further, certain products cannot be moved and hence are non-tradable across borders (e.g. land).It is not possible to equalize their prices internationally.

4.5. Exchange Rate and Balance of Payments

We will discuss how the introduction of the assumption of an open economy modifies the IS-LM model. When we have a closed economy the aggregate demand by domestic residents is equal to consumption expenditure, investment expenditure and government expenditure. Thus the domestic spending depends on the interest rate (i) and income (Y) (since investment is a function of i, while consumption is determined by the level of disposable income).

$$A (Y, i) = C+I+G$$

As we saw in the previous module, in an open economy we include trade with the rest of the world. So domestic residents spend on foreign goods and foreigners buy domestic goods; thus exports and imports of goods come into the picture. In an open economy there is equilibrium in the goods market when the demand for domestically produced goods (by domestic residents and foreigners) is equal to the aggregate supply of goods (consisting of total output produced in the economy and imports). In an open economy when we talk about spending on domestic goods then we need to add total exports and then deduct total imports.

i.e., Y = Spending on domestic goods=C+I+G+X –M

or Y+ M = C + I + G + X

Total exports depend on foreign income and the real exchange rate. So when foreign income increases or domestic currency depreciates, this leads to an increase in total exports, whereas total imports depend on domestic income and the real exchange rate. As domestic income increases or if there is appreciation of domestic currency this will lead to an increase in total imports.

i.e., X =X (Yf, R) and M=M(Y, R)

So net exports which is the difference between total exports and total imports is a function of domestic income, foreign income and the real exchange rate. So aggregate demand in an open economy is:

$$Y=A(Y, i) +NX(Y, Yf, R)$$

Where, NX= X (Yf, R) –M (Y, R)

Thus if there is an increase in foreign income or depreciation of domestic currency this will lead to increase in aggregate demand .But an increase in domestic income will increase total imports and thus this will make the trade balance worse off . The IS curve which indicates equilibrium in goods market shows equality between aggregate supply and aggregate demand.

$$Y=A(Y, R) +NX(Y, Yf,R)$$

Thus we can conclude that if there is an increase in foreign income or real depreciation this will lead to a rightward shift in IS curve. As in case of a closed economy, macroeconomic equilibrium occurs at the intersection of the IS and LM curves. We will now discuss the role of capital flows affecting the rate of interest in an open economy.

4.5.1. Balance of Payments, Exchange Rate and Capital Flows

An economy is linked to the international market through trade and finance. In this chapter we will analyses the modification to the IS-LM model after taking into consideration the linkages and implications of international trade and finance. For this first we need to introduce the concepts of the balance of payments and exchange rates. You may recall from our discussion in earlier modules that balance of payments is a systematic record of the all the transactions done by a country with the rest of the world. It consist of two accounts

1. Current account
2. Capital account

The current account records broadly three sets of transactions -transactions in goods and services, investment income (interests and dividends) and unilateral transfers. Transfer payments include workers' remittances, gifts and grants. So current account balance consists of net exports, net invisibles and net transfers from abroad.

The capital account records transactions in assets. When receipts from foreigners are more than payments made to them, the country has a net capital inflow .If a country has deficit in its current account then the deficits need to be financed .This can be done by selling assets or by borrowing which means there must be a corresponding surplus in the capital account. The capital account includes transactions made by private and government agents as well as official reserve transactions. So the current account deficit is either

financed by net capital inflows on account of the private sector or the government sector or both. Official reserve transactions involve depletion or accumulation of reserves of foreign exchange held by the central bank.

When the current account is in deficit and the capital account is in surplus there could be a Balance of payment surplus if the size of the surplus exceeds that of the deficit. In case the current account deficit exceeds the capital account surplus, there is a BOP (Balance of payment) deficit. In case both current and capital account are in deficit then the central bank depletes its foreign exchange reserves. Now we will analyses the impact of monetary and fiscal policies under different exchange rate regimes. But first we will briefly revise our concepts relating to different exchange rate regimes. We will define a country's exchange rate as the number of units of domestic currency required to buy one unit of foreign currency, which indicates the price of foreign currency in terms of home currency.

For example when the dollar- rupee exchange rate is 60 it means 60 rupees can be used to buy one dollar in the foreign exchange market. This is defined as the nominal exchange rate .But when we measure the amount of domestic goods which is to be given up to get one unit of foreign good it is known as real exchange rate (R). This concept was discussed in the previous module, where we saw the real exchange is the ratio of foreign to domestic prices expressed in terms of the domestic currency.

Exchange rate regimes can be can be divided into two types

1. Fixed exchange rate system
2. Flexible exchange rate system

In a fixed exchange rate system the central bank fixes the value of exchange rate and in flexible exchange system the exchange rate is determined by demand and supply of foreign currency. With a fully flexible exchange system the central bank does not interfere at all in the process of determination of exchange rate.

Under flexible exchange rates, the demand for and supply of foreign currencies are equated through movements in exchange rates. Under clean floating the central bank does not interfere at all and the balance of payments balance is always zero, with BOP (Balance of payment) equilibrium achieved via exchange rate fluctuations. But many times the central bank does

interfere in a flexible exchange rate system, trying to influence the value of the exchange rate and this is known as a system of dirty floating. With globalization there is more and more integration of international capital markets and in this chapter assume there is perfect capital mobility, which implies when the domestic interest rate (i) is more than world rate of interest (iw) there is unlimited foreign capital inflow into the economy. When the domestic rate of interest is lower, then unlimited capital outflows take place. Thus the capital account balance depends on the interest differential between domestic and world rates of interest.

The balance of payment surplus has two components:

1. Trade surplus and
2. Capital account surplus.

Thus we can write the equation for the balance of payments surplus as

$$BP=NX(Y, Yf, R) + CF (i- iw)$$

Note, we can just add net factor payments from abroad to the trade surplus to obtain the current account surplus. Thus the balance of payment surplus depends on the following- domestic income, foreign income, exchange rate and the interest rate differential (difference between domestic rate of interest and world rate of interest). So when we have trade deficit then that has to be financed by a capital inflow to have balance of payments equilibrium. When the balance of payments is zero we say we have external balance. In the graph the horizontal axis shows domestic output and vertical axis shows interest rate. The BP=O line is parallel to the x-axis.

Due to the assumption of perfect capital mobility, when the domestic and world interest rate are same we have external balance. When the domestic interest is more than the world rate of interest then there will be unlimited capital inflow and there will be surplus in balance of payments.

On the other hand if domestic interest rate is less than the world interest rate there will be unlimited outflow. When both domestic and world rates of interest are equal, BP=O and the line is parallel to the x-axis; points above this line indicates surplus and below this indicate deficit in balance of payments situation. . Now we will extend the analysis of output determination to the open economy with perfect capital mobility under different exchange rate regimes.

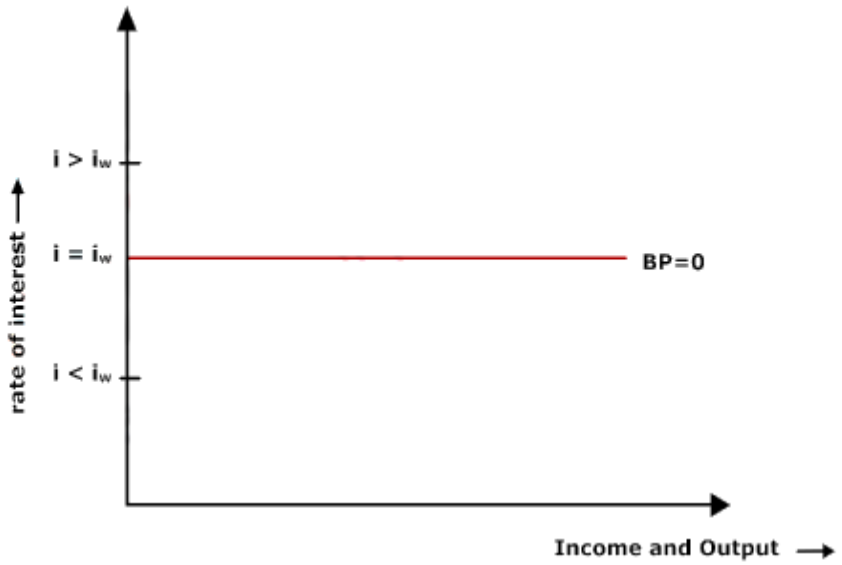

Fig.4.4.

4.6. Open Economy IS-LM Model (Mundell-Fleming model)

Robert Mundell and Marcus Fleming have extended the IS-LM model to the open economy under perfect capital mobility and thus this analysis is well known as the Mundell-Fleming Model. Throughout this analysis we will assume that aggregate prices are held constant, the standard assumption in the IS-LM framework.

4.6.1. Fixed Exchange Rate Regime

4.6.1.1. Effectiveness of Monetary Policy

(A) Impact of Monetary Expansion with Perfect Capital Mobility and Fixed Exchange Rates:

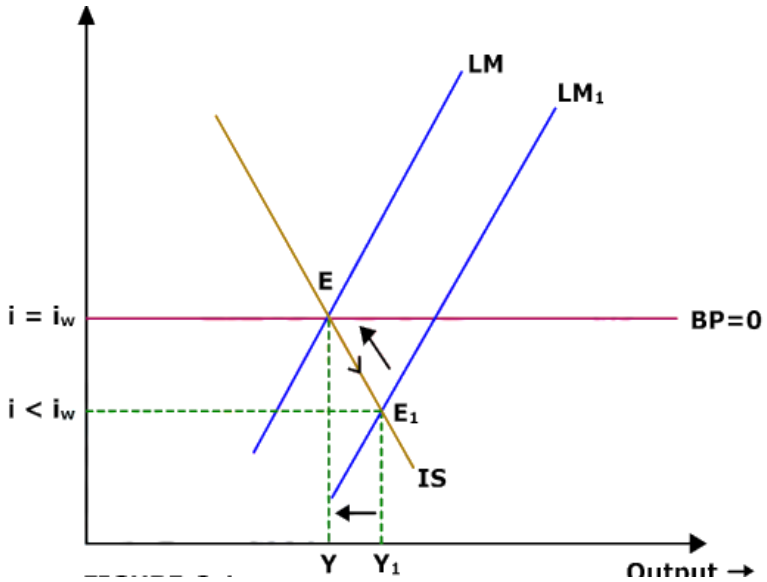

Fig.4.5

As shown in Figure 4.5 above, the initial equilibrium is at E at the intersection of the IS and LM schedules. At this point external balance or BOP equilibrium is shown by the horizontal BP=O line where there is equality between domestic and world rates of interest. Now let us assume we have monetary expansion. This will lead to a rightward shift in LM and the new equilibrium is at E1. At this point the domestic rate of interest rate is lower than the world rate i.e. i<iw. So this sets off a capital outflow from the economy and will lead to a balance of payments deficit. This deficit puts pressure on the exchange rate to depreciate. But since the economy is under fixed exchange rate the central bank will intervene and will sell foreign exchange and buy rupee. This will lead to reduction in domestic money supply and will shift LM towards the left .This process will continue till the original equilibrium E is reached. We will learn more about the role of foreign exchange reserves and its impact on the money supply in one of the later modules.

(B) Impact of Monetary Contraction with Perfect Capital Mobility and Fixed Exchange Rates:

When the economy has a fixed exchange rate regime and perfect capital mobility, the central bank cannot set the interest rate at a level that is different from the world rate of interest. Let us see the effect of monetary contraction under perfect capital mobility and fixed exchange rate. Suppose the central bank wants to increase the rate of interest in the economy and reduce the money supply. When the rate of interest is more than the world rate this will lead to infinite capital inflows that would result in a surplus in the balance of payments of the economy. Because of the surplus, domestic currency would tend to appreciate. However, since the exchange rate is fixed, the central bank would intervene to hold the exchange rate constant and it would buy up foreign exchange and sell rupee. This action would lead to an increase in the stock of domestic currency which would restore the interest rate to the world level. Let us show the process graphically (Figure 4.6 below):

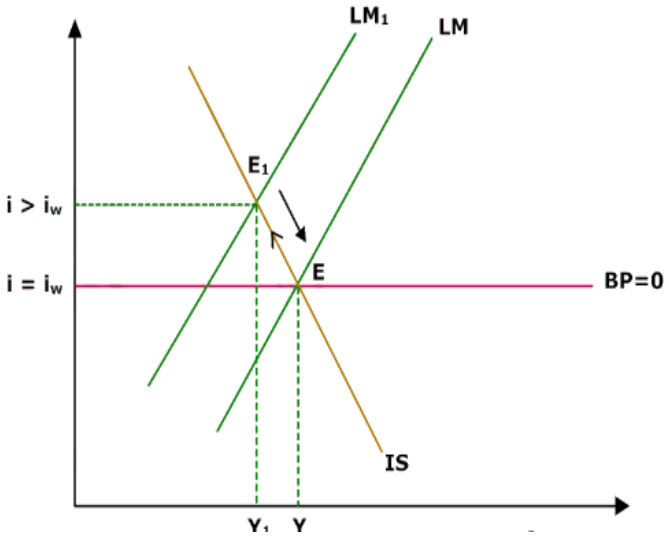

Fig.4.6.

In the above graph we have the IS, LM and BP=O schedules. The BP=O line is parallel to the horizontal axis in the economy with perfect capital mobility. When domestic rate of interest is equal to world rate of interest or in other words when i=iw, IS and LM intersects at E which shows the initial equilibrium. Then there is monetary contraction and the LM curve shifts towards the left and the economy moves to E1. At E1the domestic rate of interest rate is higher than the world rate so there will be capital inflow. This will further create pressures for appreciation of the domestic currency. But since the economy is under fixed exchange rate regime the central bank will intervene and buy foreign exchange, leading to an increase in domestic money supply. As a result the LM will shift downward and this process will continue till the initial equilibrium is reached. So we can conclude that when we have perfect capital mobility and fixed exchange rates then monetary policy is ineffective. This was demonstrated in both cases above, where a change in monetary policy had no impact either on output or interest rates. Further, in order to maintain exchange rate parity, money supply had to adjust so as to hold domestic interest rates equal to the world rate of interest, under conditions of perfect capital mobility.

4.6.2 Effectiveness of Fiscal Policy

(A) IMPACT OF FISCAL EXPANSION WITH PERFECT CAPITAL MOBILITY AND FIXED EXCHANGE RATES

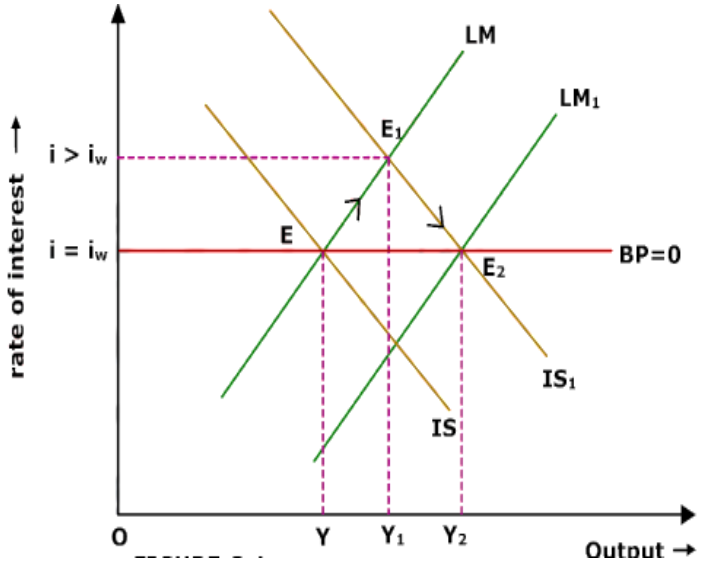

Fig.4.7.

From the graph you can see the initial equilibrium is at E. When we say there's a fiscal expansion it implies either a cut in tax rate or an increase in government expenditure. You may recall from our discussion in the previous module if there is an increase in government expenditure or a cut in tax rate this will lead to an increase in aggregate demand and shift the IS curve towards the right. This rightward shift will bring the economy to E1.At E1 since the domestic interest rate is more than the world rate i.e. i>iw this will lead to capital inflow and will put pressure on the exchange rate to appreciate. But because of fixed exchange rate the central bank will intervene and buy foreign exchange. This will lead to an increase in the stock of domestic currency. This increase in money stock will lead to rightward shift in LM till domestic and world interest rates are equal. As you can see from the graph the new equilibrium is at E2where I = iw, the output has further increased to OY2, the level that is attained when there is absolutely no crowding out.

(B) IMPACT OF FISCAL CONTRACTION WITH PERFECT CAPITAL MOBILITY AND FIXED EXCHANGE RATES

With a given money supply and initial equilibrium at E, a fiscal contraction will lead to a leftward shift of the IS, so that the economy is at E1. But at this point the rate of interest is below the world rate of interest i.e. i<iw so this will lead to capital outflow and depreciation of the domestic currency. But since the economy has adopted a fixed exchange rate system, the central bank will reduce the money supply by selling foreign exchange. This reduction

in money supply will shift the LM towards left and the new equilibrium will be at E2 where IS1 and LM1 intersect and the domestic and world interest rates are equal i.e. I = iw. In this process the trade balance situation will improve but the new equilibrium output would be below the original level. From the above discussion we can conclude that the fiscal policy is very effective under perfect capital mobility and fixed exchange rate as this leads to output expansion when there is fiscal expansion. Further, there is no crowding out, owing to the 'endogenous expansion of money supply' that occurs to maintain the exchange rate parity under the system of fixed exchange rates.

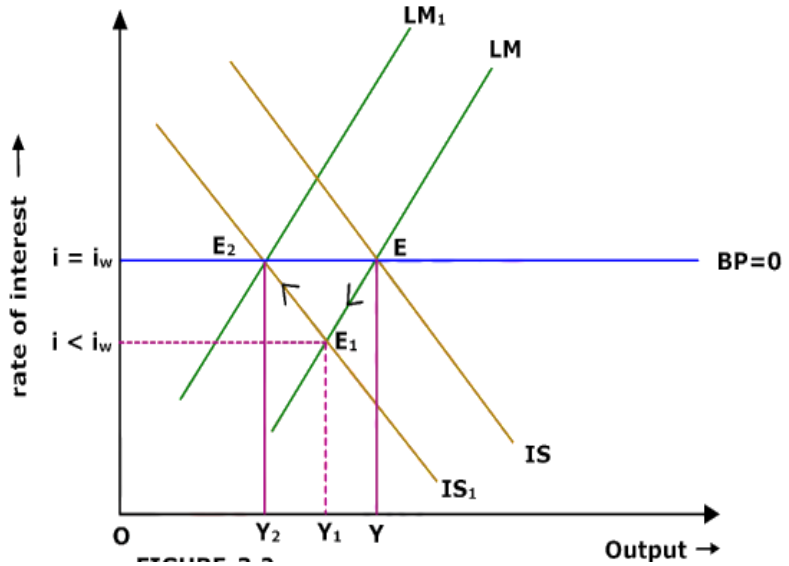

Fig.4.8.

4.7 Flexible Exchange Rate

Regime now we examine the effectiveness of fiscal and monetary policies with perfect capital mobility and flexible exchange rates. When the economy has a fully flexible exchange rate regime the central bank does not intervene in the foreign exchange market and there is no automatic link between the balance of payments and money supply as the central bank does not need to maintain foreign exchange reserves for intervening in currency markets.

4.7.1 Effectiveness of Monetary Policy

(A) IMPACT OF MONETARY EXPANSION WITH PERFECT CAPITAL MOBILITY AND FLEXIBLE EXCHANGE RATES

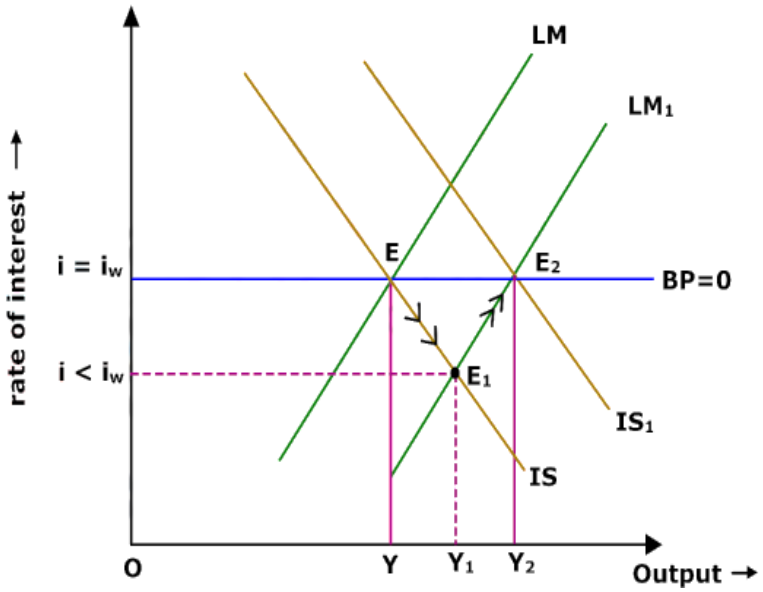

Fig.4.9.

As you can see from the graph the initial equilibrium is at E where the IS and LM curves intersect. Now let us assume there is an increase in the nominal stock of money. As discussed in the last module this will lead to a shift in LM curve towards the right and the economy will be at E1. As you can see here the domestic rate of interest is below the world rate of interest i.e. i<iw, this will lead to capital outflow and depreciation of the domestic currency. As you may recall from our discussion in the previous module, a currency depreciation leads to an improvement in the trade balance (assuming the Marshall-Lerner condition holds). So this improvement will shift the IS curve to IS1 and the final equilibrium will be at E2 where IS1 and LM1 intersect. So we can conclude that when there is monetary expansion, there is improvement in the trade balance and the output level increases.

(B) IMPACT OF MONETARY CONTRACTION WITH PERFECT CAPITAL MOBILITY AND FLEXIBLE EXCHANGE RATES

Now let us assume there is a reduction in the nominal money stock .This will lead to a shift in the LM curve towards left to LM1. From the graph you can see that the domestic interest rate is more than the world rate of interest i.e. i>iw so there will be capital inflow and this will lead to an appreciation in the exchange rate. This appreciation will make the trade balance worse and because of this the IS will shift towards the left i.e. to IS1. So finally the equilibrium will be at E2 at the intersection of IS1 and LM1. Thus we can conclude that when there is monetary contraction this will lead

to a decrease in output and reduction in net exports as there is appreciation of the domestic currency.

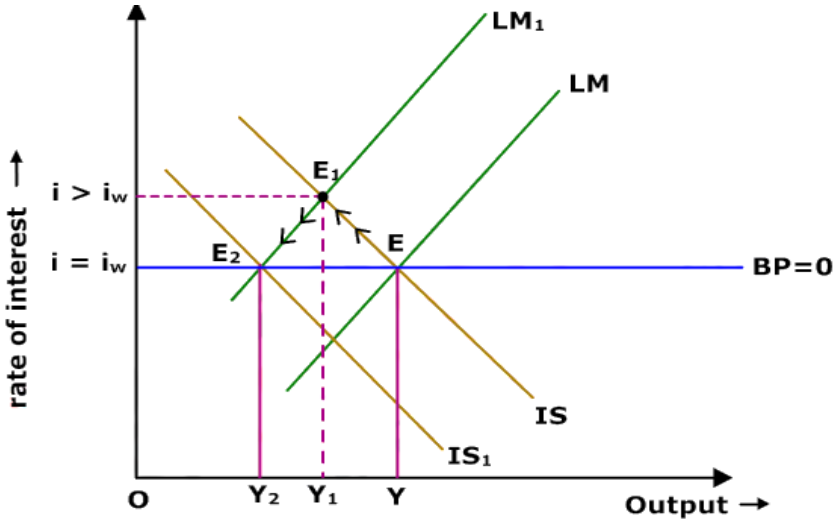

Fig.4.10.

4.7.2 Effectiveness of Fiscal Policy

(A) IMPACT OF FISCAL EXPANSION WITHPERFECT CAPITAL MOBILITY AND FLEXIBLE EXCHANGE RATES

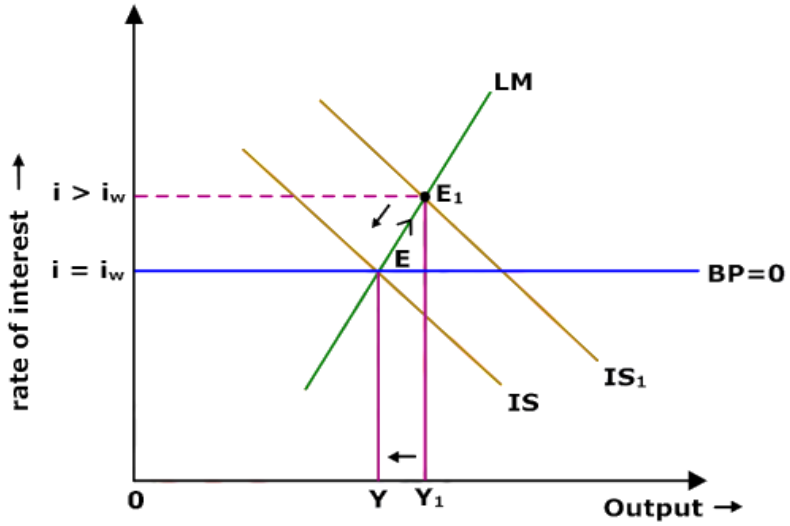

Fig.4.11.

The graph shows the initial equilibrium is at E; then we have fiscal expansion which shifts the IS curve towards the right. This rightward shift brings the economy to E1. At this point the domestic interest rate will be more than the world interest rate so there will be capital inflows that would lead to appreciation of the domestic currency. This appreciation would reduce net exports, which is one of the components of aggregate demand, leading to a shift of the IS curve towards the left. Finally the equilibrium is achieved at the initial level i.e. E. So you can see that in this case despite the expansionary

fiscal policy output will come back to the original level, while the trade balance would worsen because of the appreciation in the exchange rate.

(B) IMPACT OF FISCAL CONTRACTION WITHPERFECT CAPITAL MOBILITY AND FLEXIBLE EXCHANGE RATES

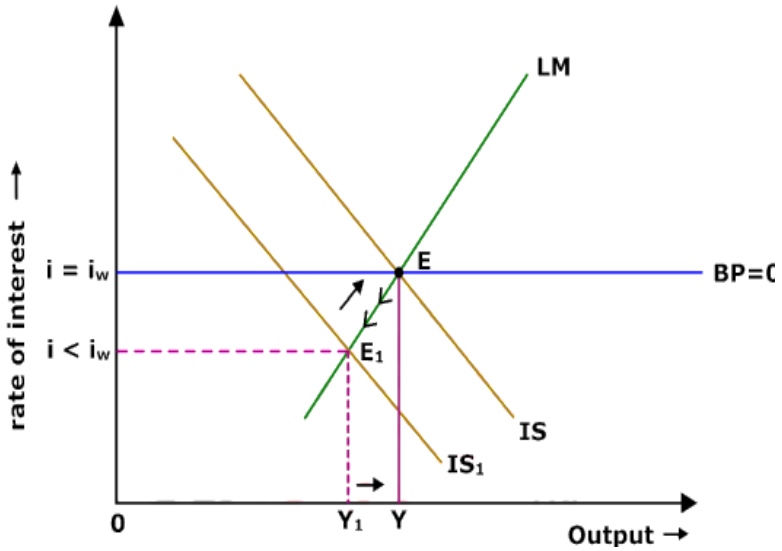

Fig.4.12.

Let us assume there is a cut in government expenditure, then this fiscal contraction will lead to a shift in the IS towards the left and the economy will be at E1. At this point since domestic rate of interest is lower than world rate of interest i<iw this will lead to capital outflow and currency depreciation. Depreciation in the exchange rate will improve the trade balance and this will shift the IS curve from IS1 back to the original level. So we can conclude that when there is fiscal contraction there is no change in output as the economy finally moves back to the original level and there is improvement in trade balance because of currency depreciation (assuming the Marshall-Lerner condition holds). From the above discussion we can conclude that under fixed exchange rates and with perfect capital mobility monetary policy is ineffective but fiscal policy is quite effective. But under a system of flexible exchange rates with perfect capital mobility it is the other way round i.e, fiscal policy is ineffective but monetary policy is very effective.

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UNIT - V

MACRO ECONOMIC POLICIES

5.1. Introduction

Macroeconomic policies play a useful role in attaining macroeconomic objectives of economic growth, employment and price stability. Fiscal policy and monetary policy are two important instruments of the macroeconomic policy of a government. Fiscal Policy is changes in the tax and spending pattern of the central government for the purpose of expanding and contracting the level of aggregate demand. Monetary Policy is changes in the interest rates and money supply to expand and contract aggregate demand under the control of the central bank, say Reserve Bank of India (RBI) in India. Changes in the monetary policy are more frequent and can be made at any time during a year. However, changes in fiscal policy take longer time as it requires parliamentary approval. The interdependence between fiscal policy and monetary policy is considerable. The fiscal policy has a direct impact on the goods market and the monetary policy has a direct impact on the money markets. The two markets interact with each other influencing output and interest rates by the simultaneous equilibrium in goods and money markets. Therefore, the present module examines the interdependence of fiscal and monetary policy through the changes in the aggregate demand.

5.2. Stabilisation Policies

5.2.1. Economic Policy and Business Cycles

Market economies have regular fluctuations and do not always work smoothly. The short term oscillations in economic activity with regard to output, income and prices over time have been called business cycle. It extends over a period of several years. In the phase of high income, output and employment, there is expansion or boom. Recessions are typically short-term and are marked by falling employment, output, income, prices and interest rates. Most significantly it is marked with rising unemployment. The economy will hit a bottom – a trough &then rebound into recovery. The recovery will enjoy increased employment, output and income. The classical economists were of the view that an automatic mechanism works to restore stability in the economy. The recession will cure itself and inflation will be automatically controlled. However, the empirical evidence during the 1930s

when severe depression took place in the Western capitalist economies and also the post Second World War II period shows that no such mechanism works to bring about stability in the economy. During the Great Depression, in 1936, Keynes argued that the business cycle was due to extreme swings in the total demand for goods and services in an economy from households, business and government i.e. aggregate demand. The intervention of the government to cure recession & inflation by adopting appropriate tools of macroeconomic policy would be required. The economic policies used by the government to even-out the extreme fluctuations of the business cycle are called stabilization policies or contra-cyclical policies. Stabilization is not easy to achieve. It takes policy makers to recognize the existence of the problem, time for them to implement a solution and more time taken by the economic agents to respond to the policies taken. Thus, the government has two types of policies to control aggregate demand – fiscal policy and monetary policy which are used to stimulate the economy. During a recession, the government pursues expansionary economic policies and when they are used to contract the economy during inflation or overheated expansion the government pursues contractionary economic policies. Monetary policy can be adjusted more quickly than fiscal policy making it useful in stabilizing the economy. However, the economy's macroeconomic management is slower for monetary changes as compared to fiscal changes.

5.3. Fiscal Policy and Monetary Policy

5.3.1. Mechanism of Fiscal Policy

Fiscal Policy is comprised of mix of budgetary instruments like the use of taxation and government expenditure to influence the aggregate level of economic activities at the macroeconomic level. It aims to achieve economic objectives with soundness of public finance. The main policy objectives of fiscal policy that takes due account of state of the economy over long term is as follows:

1. To mobilize resources for economic growth
2. To achieve the target of full employment
3. To restrain price instability in order to ensure economic stability; and
4. To achieve equitable distribution of income and wealth Governments fiscal policy is used as an active instrument of economic stabilization

by minimizing the inflationary as well as recessionary fluctuations in the income by reducing or increasing the aggregate demand. The two mechanisms of fiscal policy are: Discretionary fiscal policy and automatic stabilizers. The brief reviews of the mechanism are as follows:

5.3.2 Discretionary Fiscal Policy

Fiscal policy can be implemented through either discretionary or automatic measures to stabilize economic fluctuations. The discretionary elements of fiscal policy are deliberate and focused actions taken by the government to increase or decrease aggregate demand. The policy make changes in taxation and public expenditure policies to meet the recessionary and inflationary situations.

5.3.3. Fiscal Policy to control recession

At the time of recession, the Government's deliberate action is the expansionary fiscal policy by which the government expenditure is increased or taxes are cuts down or a combination of both aimed at increasing the aggregate demand or income. The expansionary policy is followed to close the deflationary gap i.e., when the real output or income falls short of potential output or income. The increase in government expenditure tends to lead to two effects one is multiplier effect and other is a crowding-out effect. It was learnt that the aggregate demand curve shifts to the right by an equal amount to the initial change in government expenditure times the multiplier. The increased government expenditures would increase income and increase the consumption. This means more transactions would lead to increase in demand for money which increases the rate of interest. An important question is how to finance the increase in government expenditure. The increase in government expenditure must not be financed by raising taxes as it offsets the expansionary effect. Therefore, proper discretionary fiscal policy is to finance the government expenditure is to borrow from the public in the money market. This increases the interest rates if not administered by the Central Bank. As investment is inversely related to rate of interest, the investment will fall and will then partially offset the increase in aggregate demand brought about by the increase in government expenditure. This is due to crowding out of investment or crowding out effect. The expansionary fiscal policy in relation to reduction in taxes increases the aggregate output or income.

In the figure 5.1: Expansionary Fiscal policy in goods and money market

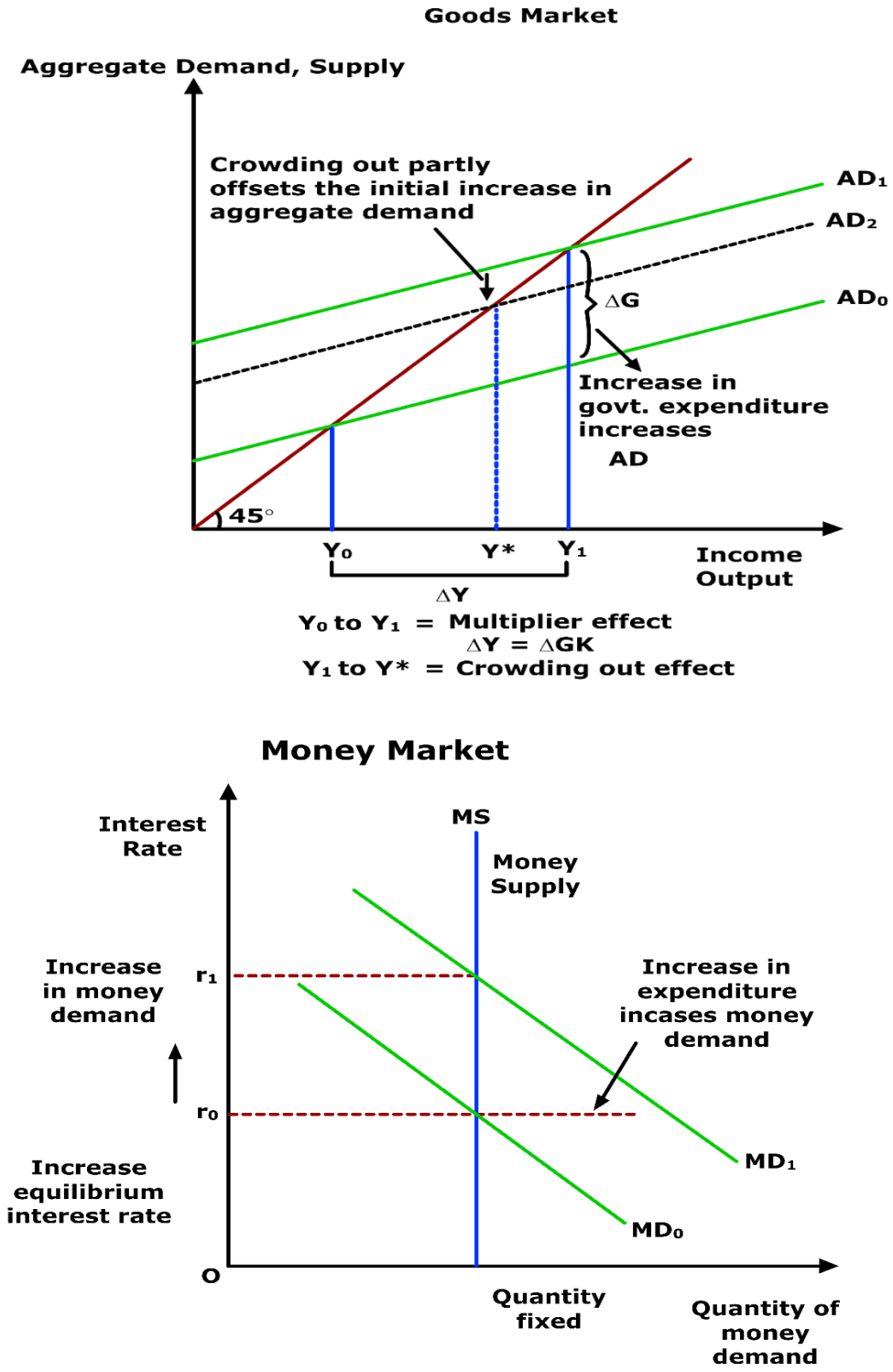

Fig 5.2: Expansionary Fiscal Policy

An increase in government expenditure from Go to G1 shifts the AD curve upward or rightward AD0(C+I+Go) to AD1(C+I+G1). The income increases from Y0 to Y1. This increases the demand for money to rise, which results in disequilibrium in the money market. The excess demand for money increases

the interest rate from r0to r1causing investment to decrease from I0 to I1. This results in the fall in the AD curve from AD1(C+I+G1) to AD2(C+I1+G1). This is crowding out where investment is crowded out by the higher interest rate. Thus reduces the income from Y1 to Y*. Exactly same reasoning holds for reduction of net taxes. Thus the ultimate increase in the income Y will be less than it would be if the interest rate did not rise.

5.3.4. Fiscal Policy to control Inflation:

At the time of inflation the government's deliberate action is the contractionary fiscal policy by which the government expenditure decreases or the taxes are raised or a combination of both aimed to decrease in aggregate demand or income. The contractionary policy is followed to close the inflationary gap i.e., when the real output or income is in excess of potential output or income. The AD curve shifts to the left by an equal amount to the initial change in government expenditure times the multiplier. The decreased government expenditures would decrease income and decrease the consumption. A decrease in government expenditure tends to decrease in demand for money and a decrease in the interest rate. However, the decrease in income is somewhat offset by the increase in planned investment resulting from the lower interest rate. A contractionary fiscal policy means less expenditure by government, which hampers the economic growth of a country. So, the government has to strike a balance between growth prospects and crowding out. The contractionary fiscal policy in relation to increase in taxes reduces the disposable income which further decreases the aggregate demand.

In the figure 5.3: Contractionary fiscal policy in goods and money market.

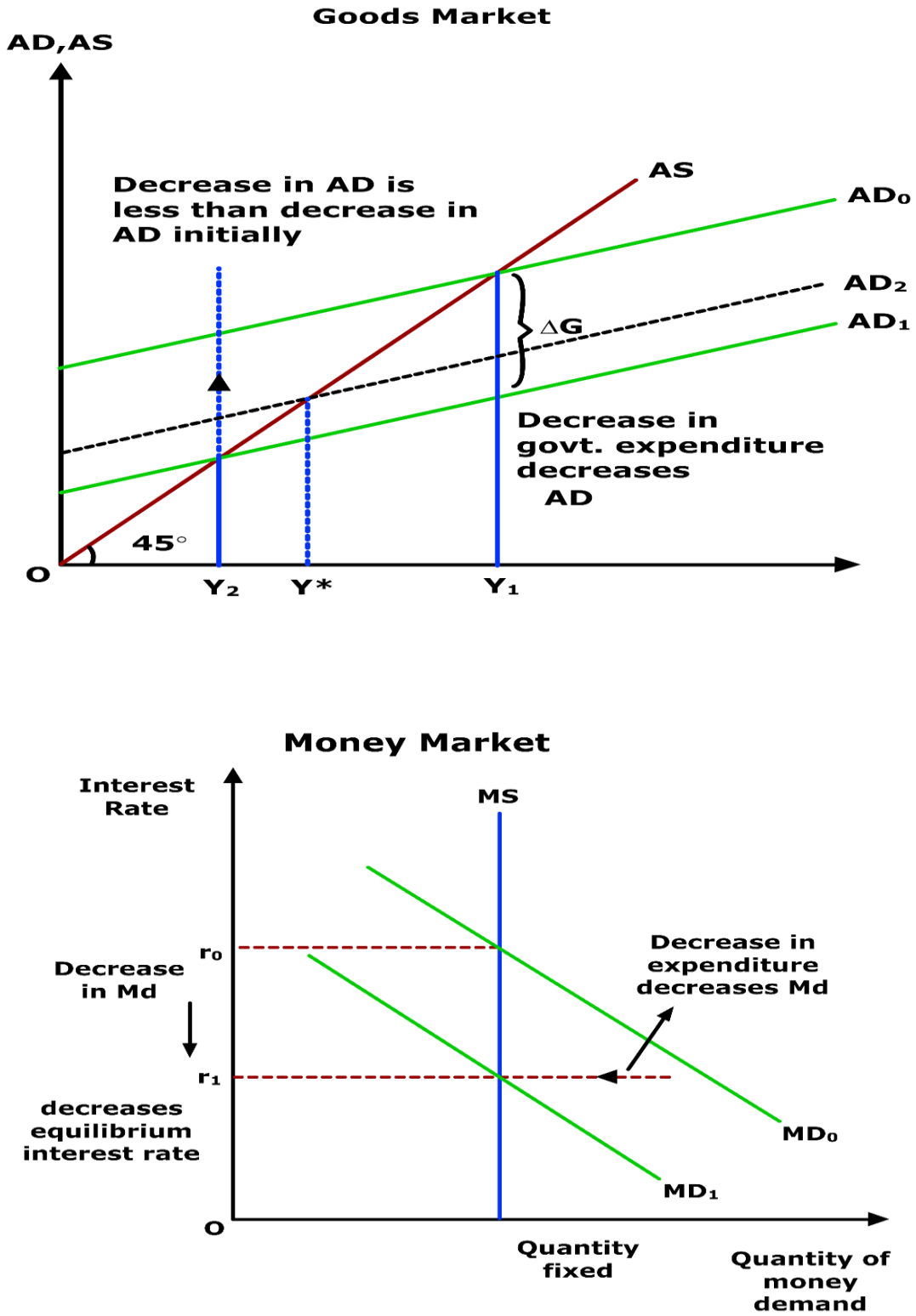

Fig.5.4. Contractionary Fiscal Policy

A decrease in government expenditure from Go to G1 shifts the AD curve downward or leftwardAD0(C+I+Go) to AD1(C+I+G1).The income decreases

from Y0 to Y1. This decreases the demand for money, which results in disequilibrium in the money market. The lower demand for money decreases the interest rate from r1 to r0causing investment (I) to increase from Io to I1.This results in the increase in the AD curve from (C+I+G1) to AD2(C+I1+G1). Thus, reduces the income from Y1 to Y*. Exactly same reasoning holds for increase of net taxes. Hence, the ultimate decrease in the income Y will be less than it would be if the interest rate did not decrease. When the government modifies spending or taxes, the resulting shift in AD can be larger or smaller than the initial fiscal change. The multiplier effect tends to magnify the effects of fiscal policy on AD whereas, the crowding-out effect tends to diminish the effects of fiscal policy. The crowding out or crowding in effect weakens the impact of fiscal policy on the economy.

5.3.5. Limitations of Discretionary fiscal policy: Stabilization goals are not easy to achieve. The existence of various types of time lags in the response of the economy to the stabilization policies can make the economy difficult to control. The effectiveness of discretionary fiscal policy measures for correcting cyclical fluctuations is questionable because of its following limitations:

1. Recognition lag: This refers to the time needed to recognize the existence of a boom or recession. It takes time to collect information and prepare even the preliminary estimates for the figures collected. For example, if the economy goes into recession on January 1, it may not be detected instantly until the statistical information for the first quarter is collected and analyzed. There is a lag between collection of information and application of fiscal measures for correcting economic instability. Government cannot change its fiscal policy overnight in response to fluctuations in income and output. It requires statistical information for the formulation of tax policy or expenditure policy. Hence there is recognition lag in the effective implementation of fiscal policy.

2. Implementation lag: The time it takes to put the desired policy for correcting fluctuations into effect once economists and policy makers recognize that the economy is in boom or recession. The government cannot change the decisions instantly as it involves the approval of the Parliament or administrative decision making through annual budget. Thus the implementation lag undermines the effectiveness of the fiscal policy.

3. Execution Lag: The time that it takes for the economy to adjust to the new condition after a new policy is implemented. It is the time lag between decision taken by the government and its execution. The change in fiscal policy may not have immediate effect. For example, a government expenditure increases or tax cut, the individuals or firms would not revise their spending plans instantly, thus it would not stimulate extra private spending with extra government spending or tax cut. It takes almost a year for a change to have its full effect on the economy. If we counteract the recession state with the fiscal policy its effect would be realized in a year's time and by that time the state of the economy might be very different.

Discretionary fiscal policy can be used in these cases, but has two shortcomings: it suffers from implementation lags, including apolitical decision-making process influenced by multiple (possibly contradictory) considerations; and is not automatically reversed when the economic cycle improves, giving rise to a potential deficit bias.

5.3.6. Automatic Stabilizers

Discretionary fiscal policy helps to stabilize the economy during cyclical fluctuations. It involves the limitations of lags in recognizing the problem of recession or inflation and taking appropriate action to tackle the problem. The policy implemented is not reversed automatically when the economic conditions stabilizes. The second type of fiscal policy is built into the structure of taxes and expenditure and help counter fluctuations in the business cycle. This is referred to as the non-discretionary fiscal policy or more commonly automatic stabilizers. They enact countercyclical policy without the lags associated with discretionary policy changes. No political decisions are required and therefore implementation lags are minimized. It reduces the impact of recession and inflation and helps in ensuring economic stability. The automatic stabilizers ensure a prompter and self-correcting fiscal response. They operate in relation to the business cycle. The Built-in-stability of taxes and government expenditure of transfer payments and subsidies pattern automatically raise aggregate demand in times of recession and reduce aggregate demand at the time of inflation without any deliberate action by the Government or Parliament. The changes in expenditure and taxes that occur through automatic stabilizers do not shift the aggregate

demand curve because they are automatic. The important automatic stabilizers include personal income tax, corporate income tax, transfer payments such as unemployment compensation, social security schemes and welfare benefits. The working of automatic stabilizers depends on the size of government but also on how responsive taxes and expenditures are to cyclical fluctuations and the progressivity of the tax system. For instance, consider the decline in real income during the recession. The decline in economic activity would automatically reduce tax payments reducing the impact of downturn on personal disposable income. This would increase transfer payments boosting disposable income further. Rising transfer payments and falling tax collections helps household from the impact of recession.

5.3.7. Factors Affecting the Automatic Stabilizers:

1. Size of the government: Automatic stabilizers are related to the size of the government, and are likely to be larger in advanced economies. Where stabilizers are larger, there may be less need for discretionary fiscal policy In many low-income and emerging market economies due to institutional limitations and narrow tax bases, automatic stabilizers are relatively weak.

2. Tax structure: Taxes act as automatic stabilizers. Revenue from direct and indirect taxes is dependent upon the level of economic activities. Direct taxes like personal income tax or corporate tax (companies or corporations also pay a percentage of their profits as tax to the government) are progressive in nature and rise more than proportionately with income during the boom and decrease during the recession. The tax structure is so designed that revenues from these taxes varies directly with income. When national income increases during expansion or inflation, the higher rates on higher income would decline the disposable income thereby reducing the peoples consumption and thus aggregate demand resulting in contractionary effect. On the other hand, at the time of recession, the decline of revenue prevents the decline in aggregate demand by the same proportion as the decline in income resulting expansionary effect. Progressive taxes like income tax increases the tax revenue during inflation pushing people into higher income brackets and thereby reducing government budget deficit or increasing government surpluses. During recession the government budget deficit increases or reduces government surpluses because many individuals fall into lower tax

brackets or they do not have any tax liability. The income reduces and unemployment increases. Similarly, the corporate taxes increase during inflation or boom and decrease during recession times. The more responsive tax collections are to changes in economic conditions, the larger are the revenue-related stabilizers.

3.Expenditure Structure: Expenditure programmes, in particular unemployment benefits, transfer payments, subsidies, subsidies to farmers, targeted cash transfer program, food stamps, public works programme, social benefit programs have a stabilizing impact on disposable household income that enhances the income of the poor household at the time of recession. Unemployment insurance programs are important in advanced economies, although much less widespread in developing economies. In the developing countries the welfare augmented programmes works during the recession that reduces the poverty and give them social benefits. At the time of recession the output and income falls and as a result unemployment increases. The government has to spend more on unemployment benefits and other welfare programmes to reduce poverty and enhance income. This government expenditure tends to make recession short lived and automatically expansionary. On the other hand, when at times of inflation, national income increases and unemployment falls, government curtails its expenditure on social benefits thus controls inflation and make fiscal policy automatically contractionary. It is important to note that the automatic stabilizers also raise key policy issue as it may have effects on other fiscal policy goals. If the raise in automatic stabilizers is achieved by raising the tax (and expenditure) level than equity goals might be enhanced by a larger size of the government along with higher progressivity but would have efficiency cost.

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5.4. Mechanism of Monetary Policy

Monetary policy is another policy instrument with which objectives of macroeconomic policy can be achieved. The monetary policy operates through the central bank (like Reserve Bank of India in India). It is completely discretionary as it does not require the Parliament approval to implement the policy. The central bank signals the market about the availability of credit & interest rates. The key tools that the central bank focus on the stock of money and credit, the level and structure of interest rates & exchange rates. The primary objective is to ensure price stability taking due account of the overall economic development of a country. It creates conditions favourable for firms and households and thereby makes an impact contributing to stable economic development. There can be other objectives as well such as exchange rate stability, safeguarding the balance of external payments and to maintain financial stability. The main objectives of the Monetary Policy that takes due account of the economic development over the short or medium term is as follows:

1. To ensure economic stability at full employment
2. To achieve price stability
3. To promote economic growth

The mechanisms of monetary policy to achieve economic and price stability and thereby influencing aggregate demand in the economy are expansionary monetary Policy or easy money policy and contractionary monetary policy or tight money policy. It is the changes in interest rates and money supply to expand or contract aggregate demand.

5.4.1. Instruments of Monetary Policy

The major tools of monetary policy are as follows:

a) Open Market Operations: It refers to the buying and selling of government securities by the central bank with the objective of changing money supply in the money market. An open market purchase by the central bank results in increase in reserves and increase in the money supply. The sale of securities by the central bank results in decrease in reserves and decrease in the money supply.

b) Reserve Requirement ratio/ cash reserve ratio: It is the ratio of their deposit that the bank have to keep with the central bank. A decrease in the required reserve ratio increases the money supply as banks have more deposits by making loans. An increase in the required reserve ratio decreases the money supply as banks have insufficient deposits.

c) Discount rate/bank rate: It is the rate of interest at which the central bank lends funds to the commercial banks. A change in bank rate leads to change in the interest and deposit rates of the commercial banks. The higher the discount rate the higher the cost of borrowing and the less borrowing by the banks and vice versa. At the time of recession an expansionary monetary policy or easy money policy is adopted. The central bank can increase the money supply by creating additional reserves by buying government securities or by reducing discount rate or by lowering required reserve ratio. It is an increase in the money supply leading to increase in aggregate output or income and thus stimulates the economy. An increase in the money supply leads to a lower interest rate. The fall in the rate of interest would encourage the businessmen to borrow more for investment spending. This will increase the investment which is an important component of aggregate demand. The increase in aggregate demand causes the expansion in aggregate output or income. The expansionary policy is used to lift the economy out of recession. At the time of inflation a contractionary monetary policy or tight money policy is adopted. The central bank can reduce money supply by selling the government securities or by increasing discount rate or by increasing the required reserve ratio. It is a decrease in the money supply aimed at decreasing aggregate output and income. The higher interest rate brought out by the reduced money supply causes a decrease in the planned investment

and a lower equilibrium output and income. The lower equilibrium output brings about a decrease in the demand for money which means the increase in the interest rate will be less than in the case of fiscal policy. The contractionary policy is used to control inflation. The monetary policy also faces the problem of time lags. Monetary policy can be implemented more quickly and easily than fiscal policy. However, the execution lags for monetary policy are longer than for the fiscal policy.

5.4.2. Fiscal and Monetary policy Interdependence

Fiscal policy and monetary policy in any country are two macroeconomic stabilization tools. Fiscal policy is changes in the taxing and spending of the government for the purpose of expanding and contracting the level of aggregate demand. Monetary policy is changes in the interest rates and money supply to expand and contract aggregate demand under the control of the central bank. A change in one will influence the effectiveness of the other and thereby the overall impact of any policy changes in the country depending on the state of the economy and its development. Fiscal policy and monetary policy go hand in hand with each other. Both are interdependent on each other.

5.4.3. Objectives of the Fiscal and Monetary Policies

Fiscal policy and monetary policy pursue similar objectives. However, the two policies have often been pursued in different countries in different directions. These objectives are common for most economies and can be summarized as promotion of sustainable growth and high employment while maintaining stable prices. As fiscal policy is taken by the government they are usually for long term whereas the monetary policy is pursued to smooth out cyclical fluctuations in the short term. Monetary policy is pursued to achieve the objective of low inflation to stabilize the economy from output and price shocks. On the other hand, fiscal Policy aims towards high growth and employment. For achieving an optimal mix of macroeconomic objectives of price stability and growth, it is necessary that the two policies complement each other. However, the form of complementarity and reciprocity of the policies will vary according to the stage of development of the country's financial markets and institutions. (RBI, 2011) It is important that fiscal and monetary policy implementation do not exploit discretionary freedom but use

their instruments in a targeted way with the objective of achieving sustainable economic policy. The government pursues fiscal policy to determine the general directions of the monetary policy and depending upon the monetary control, the fiscal policies have to be devised. The objectives of the two policies overlap with each in normal time and thus there is no conflict between the two. Economic policy would achieve stability by reducing uncertainty and thereby would create favourable conditions for economic growth. In the stable environment the central bank is able to focus entirely on its mandate of maintaining price stability. So, successful monetary policy is predicated on healthy fiscal policy, and vice versa.

5.4.4. Mechanism of Fiscal and Monetary Policy

The countries face mix of macroeconomic imbalances and thus require consistent mix of fiscal and monetary policy response. The coordination of these policies is important to avoid imbalances. If the expansionary (contractionary) policy of one authority is met by expansionary (contractionary) policies of the other, the two policies are complementary. For instance, during a demand shock, at any given price level, aggregate demand rise or fall due to exogenous factors other than price that results in positive demand shock or negative demand shock. To correct these shocks the two policies are complement, both the authorities follow expansionary policies in case of negative demand shock to increase the aggregate demand to its original level while in the case of positive demand shock they would follow contractionary policies in order to decrease excess aggregate demand. The two policies could be conflicting when expansionary (contractionary) policy of one authority is countered by the contractionary (expansionary) policy of the other. For instance, in the case negative supply shock (decrease in aggregate supply due to increase in input prices or decline in factor productivity). This would decrease the output and increase the prices. The government would follow the fiscal expansionary policy to increase the output to its original level whereas the central bank would follow the contractionary policy so as to reduce inflation created due to shortage of output. However, there are many ways fiscal policy affect monetary policy and thus central banks. Firstly, an expansionary fiscal policy would result in increased budgetary deficits for which the government can choose expansionary monetary policy by resort to

the printing press. This would lead to inflation. The government can even resort to the funding of debt through market sources. There is a possibility of crowding out and if the domestic debt dependent on foreign funding result in balance of payment or exchange rate problems and worrying to central bank. This would further lead to banking crisis. The government can even resort to another direct channel say increasing indirect taxes - value added tax. This would raise the prices leading to wage-spiral and higher inflation. The higher taxation would be compensated by more savings and less consumption. The on-going budget deficits resulting in large borrowing may trigger lack of confidence in the economic prospects. The behavior of economic agents depends on the sustainability of fiscal policy on which central banks base their monetary policy decisions. It becomes a destabilizing factor on bond and exchange markets eventually might lead to the collapse of the monetary regime. Thus, expansionary fiscal policy may become ineffective as a means to increase demand and similarly fiscal contractions may turn out to be expansionary. It is also learnt that fiscal policy is more suitable to fight unemployment as monetary policy following expansionary policies would take longer to sort unemployment as it depends on the private sector to invest in new projects. However, government following expansionary fiscal policy by increasing expenditure on projects would open new vacancies and reducing unemployment faster. On the other hand, the monetary policy would be more effective to fight inflation than fiscal policy. The contractionary monetary policy would reduce money supply quickly and contractionay fiscal policy would take unattractive decisions like raising taxes or reducing expenditure.

5.4.5. Time lags

Both fiscal policies and monetary policies come across time lags. When the policies are initiated this would make the economy works through various rounds of production, income and consumption to realize the results. The recognition and impact lag for each is very much the same. However, the story is a little different for decision & implementation lags for monetary versus fiscal policy. The decision lag for monetary policy inclines to be relatively short. Monetary policy decisions are made by the Central Bank when faced with a business-cycle problem with very little delay. The implementation lag is also reasonably short. Policy decisions are implemented immediately (say a

day) and because monetary policy works through financial markets which operate quickly, implementation is completed in short order.

The decision lag for fiscal policy inclines to be relatively long. Fiscal policy decisions are made by the government with parliament approval. The decision on fiscal policy is delayed due to political decisions as it has to pass by the parliament. The decision lag continues and the implementation lag also tends to be relatively long. Any changes in government spending or taxes need to work through the government agencies and administration before implementation as the government makes sure that necessary rules and procedures are followed. But this tends to lengthen the time needed to implement fiscal policy. These policy lags would make the stabilization policies destabilizing. This can make the ups and downs of the business cycle worse. For example, if the influence of expansionary fiscal policy is not seen for a year or more after the onset of a recession, then that might occur during the expansion or inflation. This would over expand the economy causing high inflation. Alternatively, the impact of contractionary monetary policy is to decrease inflation created during an expansion. These policies are not counter cyclical but procyclical. Thus, to destabilize the business cycle in both circumstances, the resulting policy should not be counter-cyclical, but pro-cyclical. The policies strengthen and therefore, destabilize the business cycle. The goal of stabilization policies is to steady the business cycle and to counter fluctuations in the business cycle. In order to be successful, governments' fiscal policies and central banks' monetary policies must be in coordination to realize the economic objectives. By selecting correct policies to meet the objectives the authorities concerned needs to be prompt with fewer time lags for quick stabilization.

5.5. Tinbergen Approach

Tinbergen's economic models have been a significant contribution to the field of macroeconomics. His models have become the foundation for economic policy-making around the world. Tinbergen's models have been used to predict economic outcomes and help governments make decisions that shape their economies. The models have also been used to analyze the impact of different policies on various macroeconomic variables. Tinbergen's

work has been praised for its ability to provide a scientific basis for economic policy-making, which has led to more informed and effective decisions.

Here are some in-depth insights on Tinbergen's economic models:

1. The Tinbergen Model: The Tinbergen model is a macroeconomic model that predicts the impact of different policy decisions on key economic variables. The model is based on a system of equations that describe the relationships between economic variables such as inflation, employment, and output. The Tinbergen model is named after its creator, Jan Tinbergen, who received the Nobel Prize in Economics for his work on the model.

2. Applications of the Tinbergen Model: The Tinbergen model has been used to analyze the impact of different policies on economic outcomes. For example, governments can use the Tinbergen model to determine the optimal level of government spending to achieve a desired level of economic growth. The model can also be used to analyse the impact of monetary policy on inflation and other variables.

3. Criticism of the Tinbergen Model: While the Tinbergen model has been praised for its ability to provide a scientific basis for economic policy-making, it has also been criticized for its assumptions. For example, the model assumes that economic agents are rational and have perfect information, which is not always the case in the real world. Critics have also argued that the model does not take into account the complex nature of the economy and the interactions between different economic variables.

4. The role of Tinbergen's Models in Economic policy: Despite its limitations, Tinbergen's models have played a significant role in economic policy-making. Governments around the world have used the models to make informed decisions about policies that affect their economies. For example, the European Union uses the Tinbergen model to help determine its monetary policy. Tinbergen's economic models have had a profound impact on the field of macroeconomics. While the models have their limitations, they have provided a scientific basis for economic policy-making that has led to more informed and effective decisions.

5.6. Crowding Out and Fiscal Policy

The term crowding out refers to the reduction in private expenditure caused by an increase in government expenditure through deficit budget via a tax cut or increased money supply or bond issue. An increase in government expenditure raised aggregate demand, national income and interest rates thereby reducing private investment. This is called the crowding effect of fiscal policy. The Keynesians and monetarist differ on the effects of budget deficit on the crowding effect. The main difference between the two arises from the fact that the Keynesians emphasise on (short run) effect which show once for all shift of the IS curve, whereas the monetarists emphasise the ultimate (long run) effects.

The critics of Keynesian theory has pointed out that expansionary effect of fiscal policy is not as larger as Keynesian economists suggest. In the Keynesian theory it is asserted that when Government increases its expenditure without raising taxes or when it reduces taxes without changing expenditure, it will have a large expansionary effect on national income. In other words, deficit budget would lead to the large increase in aggregate demand and thereby help to expand national output and income. However, it has been pointed that the above analysis of effect of expansionary fiscal policy of budget deficit ignores the effect of increase in Government expenditure or budget deficit on private investment.

It has been argued that increase in Government expenditure or creation of budget deficit adversely affects private investment which offsets to a good extent the expansionary effect of budget deficit. This adverse effect comes about as increase in Government expenditure or reduction in taxes causes rate of interest to go up. There are two ways in which rise in rate of interest is explained. First, within the framework of Keynesian theory increase in Government expenditure leads to the rise in national output which raises the transactions demand for money. Given the supply of money in the economy, the increase in transactions demand for money will cause the rate of interest to go up. Secondly, in order to finance its budget deficit the Government will borrow funds from the market. This will raise the demand for loanable funds which will bring about rise in the rate of interest.

Whatever the mechanism the budget deficit or increase in Government expenditure to achieve expansion in national income and output will cause the rate of interest to go up. The rise in the rate of interest will discourage private investment. As we know from the theory of investment, at a higher rate of interest, private investment declines. Thus, increase in Government expenditure or fiscal policy of budget deficit crowds out private investment. This fall in private investment as a result of rise in rate of interest will offset or cancel out a part of the expansionary effect of increase in Government expenditure. The magnitude of this crowding-out effect depends on the elasticity of the investment demand.

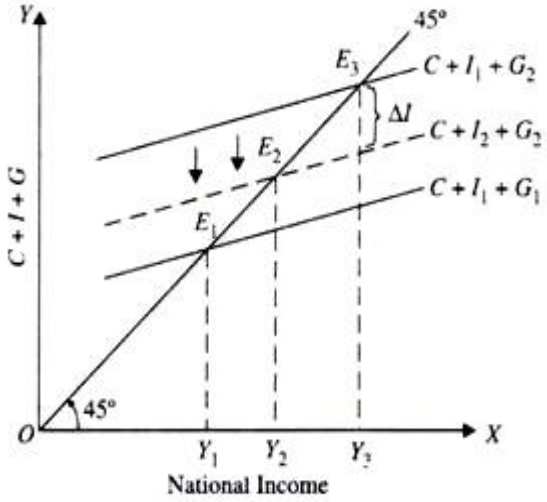

Fig.5.5. Effect of Crowding out on National Output or Income

If investment demand is more elastic, the decrease in private investment consequent to the rise in rate of interest will be quite substantial and will greatly offset the expansionary effect of the increase in Government expenditure.

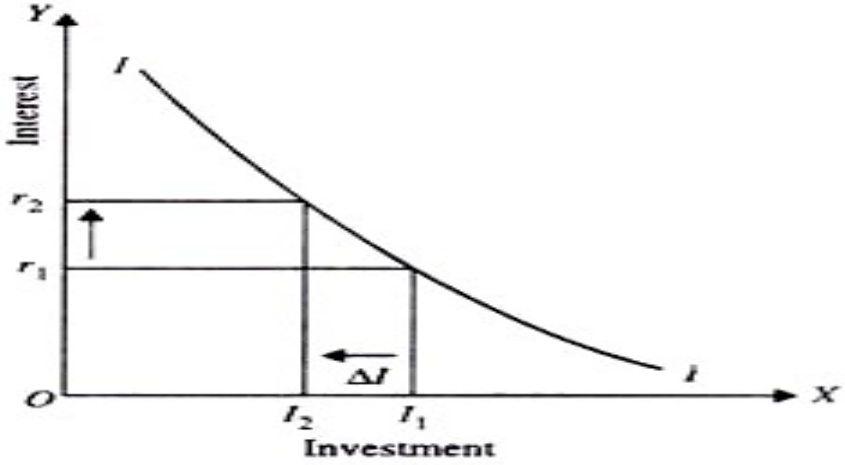

Fig.5.6. Crowding out of Private Investment

On the contrary, if investment demand is relatively inelastic, the rise in rate of interest will lead to only a small decline in private investment and therefore crowding out-effect will be relatively small. It, therefore, follows that the magnitude of crowding out weakens the effectiveness of fiscal policy. The crowding out effect of expansionary fiscal policy and its effect on national output and employment is graphically shown in Fig. 5.5 and 5.6. To begin with the economy is in equilibrium at Y_1 level of income where aggregate demand curve C + I + G_1 intersects the 45° line and determines Y_1 level of income. Let us assume that this is much below the potential or full-employment level of output. Suppose in order to raise the level of national income and output, the Government raises its expenditure from G_1 to G_2 so that the aggregate demand curve shifts upward to the new position C + I + G_2 which intersects the 45° line at point E_3.

With the increase in Government expenditure national income will rise by ΔG x multiplier, that is, by Δ G x (1/ 1 – MPC). In the absence of crowding-out effect, national income will rise to Y_3. This change in national income, ΔY or by Y_1Y_3 is equal to the increase in Government expenditure (G) times the value of multiplier 1/ 1 – MPC. However, as explained above, the increase in Government expenditure or the creation of budget deficit causes the rate of interest to rise, say from r_1 to r_2. With the rise in interest from r_1 to r_2 private investment decreases from $I_1$to I_2.

Now, with the decline in private investment expenditure, the new lower position C +1 + G_2 (dotted) and as a result new equilibrium is reached at Y_2 level of income. Thus, net result of increase in Government expenditure (DG) and crowding out of private investment equal to $_2$ or ΔI is the expansion in national income equal to only Y_1Y_2 which is relatively very small as compared to the rise in income by Y_1 Y_3 in the absence of crowding-out effect. Thus, the crowding-out effect has weakened the expansionary effect of fiscal policy.

However, in view of this author crowding out effect has been blown out of all proportions by the critics of Keynes. As a matter of fact, when Government raises its expenditure, it leads to a large increase in aggregate demand for several goods and services through the working of multiplier.

This rising aggregate demand improves investment climate by raising expectations of making profits by the private sector. That at each rate of interest, more private investment will be forthcoming. Thus, while negative crowding out effect takes place as a result of moving upward along the given investment demand curve, there is positive effect of increase in aggregate demand on private investment which occurs as a result of rightward shift in the investment demand curve. Thus, we see that crowding out effect is a highly controversial issue of macro-economics.

5.7. Rules vs Discretion

This has always been a topic of debate that whether economic policies especially the monetary policy be conducted by rules known in advance or by the policy maker's discretion. In the previous sections, active (discretionary) and passive (rule based) policies along with their pros and cons have been discussed. In recent times, modern central banks and monetary authorities have increasingly shed secrecy and mystique to engage in communicating to the public their policy framework and rationale, their goals and why they chose them, and the manner in which they intend to achieve their stated objectives. This reflects highly discretionary policy being in place. The public have shown a preference for a monetary policy that is disciplined by principles of systematic conduct so that the temptation of higher inflation can be resisted, accountability and credibility can be earned, and policy uncertainty among market participants can be reduced. This reveals a conscious effort to mitigate the problem of dynamic inconsistency to some kind of pre-commitment to a policy rule. Rule based economic and monetary policies work efficiently under a given set of conditions. In real world, economic conditions are not static but purely dynamic, so a given rule which works in one set of conditions may not work that much effectively in another. One monetary policy rule is better than another only if it results in better economic performance according to some criteria such as inflation or the variability of inflation and output. Neither theory nor evidence points convincingly to any of the numerous competing models as superior in explaining the interaction of nominal and real variables as occurs in actual practice. The relevance of expectations of the future and events of the past to current decisions gives

the modern-day rules a dynamic feature. Changes in preferences or technology make the decision rules stochastic. The rules pertain to the whole economy, not to an individual sector, and this makes them general equilibrium rules. There have been many simple and complex rules like Taylor rule, McCullum rule which have guided the policies. Simple policy rules work well; their performance is surprisingly close to that of fully operational policies and more robust than complex rules across a variety of models. Although policy rules can be written down algebraically, they will probably be more useful as guidelines than as mechanical formulae for policy makers to follow exactly at least for the near future. The advantage with rule based policies is that they promote transparency and bring in certainty in the policy environment. Rules that have optimal properties help to deal with the uncertainty inherent in the monetary policy process, uncertainty about the current state of the economy and about where the economy would be going with no change in the policy rate more generally, policy tools that are based on rules leave less room for policy error. Moreover, once in place, they act as an effective pre-commitment device. A rule-based approach requires a very high degree of confidence that the predefined variables would always correctly perform as intended, without noise. This is difficult to achieve for inflation targeting, much more so for identifying financial instability. In fact, the adoption of a purely rule-based framework focusing on a macroeconomic indicator has faced several drawbacks including, for instance, the inability to face unexpected structural changes. A discretionary framework comes to the rescue to addresses this issue, by allowing policymakers to actively learn from observing the interaction of relevant stakeholders. Flexibility and adaptability of discretion have some costs associated as they involve limited predictability of decisions and they come along with an incentive for policymakers to postpone backfiring decisions, particularly if they are subject to some form of political pressure – including the pressure of public opinion. Thus, rules would be the everyday framework, while discretion would represent an extreme resort. Provided that the two are extremes and there is a trade-off between ex-ante efficiency of discretion and ex-post efficiency of rules, hybrid regimes of constrained discretion will serve the objectives of monetary policy. This hybrid setting can put more emphasis on rules and changing the

discretion as and when required. In order to mitigate the possible dangers generated by discretion, central banks may opt for a clearly stated, transparent and accountable decision making process.

Fiscal policy makes adjustments in the budget through the influence on the level of aggregate demand. It comprises of government expenditure and taxation that government use to target economic objectives i.e. to achieve economic growth, distributive justice, price stability and full employment in the country. The classical theory advocated surplus budget when govt spending was insufficient and remained confined to maintain law & order in the country or the functions of a policing of state. The revenues and expenditures were listed as few items on the budget. The developed countries took to balanced budget theory after the Second World War. The developing countries started advocating the theory of deficit budgets for development. Keynesian economics suggested that adjusting govt expenditure and tax rates can be used to stimulate the aggregate demand that encourages economic activity during the periods of recession or budget deficit. The govt can implement deficit expenditure policies. During periods of high economic growth, a budget surplus can be used to decrease the activity in the economy. The expansion policies reduce the levels of aggregate demand bringing about price stability. Budget deficit is an important variable and policy target. In USA and several other developed nations (also in some developing countries following US practices), the concept of budget deficit that was generally employed for analytical purposes has been the overall deficit taken to equal the difference between total expenditure and current revenues. This is also called fiscal deficit and has been adopted by the IMF as the principle policy target in their programmes. This module briefly examines the various concepts of budget deficits and its implications on the economy.

5.8. Government Budget Deficit and Surplus

The Budget is a large document that shows the details of all the items government plans to spend money on and all the sources of government revenues for the financial year. The budget of the government has two parts: Revenue Budget and Capital Budget. The revenue budget shows revenue receipts and the revenue expenditures that are met from these revenues.

Capital budget of the government comprise of capital receipts and capital expenditures. It shows the capital requirements and their financial patterns. The difference between the receipt and its expenditure is the budget deficit (-) or budget surplus (+) which is net national government saving. An excess of government expenditure over tax revenue is budget deficit. An excess of tax revenue over government expenditure is a budget surplus exists. A balanced budget is when the government expenditure is exactly equal to tax revenue. Budget deficits in the economy reduce national savings. National savings is the sum of private saving (savings of households out of after-tax income) and public saving (the tax revenue that the government saves rather than spends), the source of loanable funds. When the government runs a budget deficit, it results in dissaving. Public saving gets reduced and becomes negative that further reduces the national savings. Government finance budget deficits by borrowing in the bond market. Borrowing when gets accumulated is the government debt. The borrowings are thus used to meet expenditure needs including servicing of old debt. The supply of loanable funds available to households and firms for investment gets reduced when the government borrows to finance the budget deficit. This increases the interest rate that alters the behavior of households and firms. It discourages the demanders of loanable funds. The government borrowing crowds out the investment or investment decreases. Since investment is important for long-run economic growth, budget deficit reduces the economy's growth rate. Government budget surplus works in opposite, it saves the difference after meeting out the government debt. It increases the supply of loanable funds, reduces the interest rate and stimulates investment and thus more economic growth. Algebraically, this can be explained using accounting identities:

$$Sp=Y-T-C \text{ and}$$

$$Sg=T-G$$

Where Sp is private saving and Sg is public saving, Y is gross domestic product (GDP), T is taxes, C is private consumption, and G is government expenditure.

Then, National saving, Sn = Sp+Sg

$$Sn = Y-C-G \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

$$\text{Given, } Y = C + I + G + NX \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

Where C is consumption, I is investment, G is govt expenditure, and NX is net exports (Exports-Imports) or (X-M).

Substituting this equation 2 for Y in 1 for national savings

$$S = I + NX \quad \ldots\ldots (3)$$

Therefore, the national saving is equal to investment and net exports. In other words the overall fall in investment & net exports essentially must match the overall fall in the national saving to the extent that budget deficits increase the trade deficit (that is, reduce net exports) and create a corresponding effect of increase in flow of assets abroad. A rise in interest rates also increases the demand for the domestic currency in the market for foreign exchange, causing the currency to appreciate. The appreciation of the currency, in turn, affects trade in goods and services. Exports fall, imports rise, and the trade balance moves toward deficit. Thus, budget deficit reduces national savings which would reduce investment and net exports.

5.8.1. Theoretical Perspective of Budget Deficit

Government deficits and government debt has become the most serious concern in both developed and developing countries. An extensive theoretical perspective has been developed to examine the budget deficit and its impact on macroeconomic variables like savings, investment and growth. Amongst the mainstream analytical perspectives, the three distinct schools of thoughts on budget deficit are noteworthy and are as follows:

Neoclassical School: The Neoclassical School considers farsighted individuals planning their consumption over their own life cycle. Budget deficits raise total lifetime consumption. It shifts the taxes to future generations, increasing current consumption. By assuming full employment of resources the neoclassical school argues that increased consumption implies a decrease in saving. Interest rates must then rise to bring equilibrium in the capital markets. The higher interest rates with budget deficit would crowd-out private investment. This would lead to decline in private investment. The neoclassical view considers budget deficit detrimental to investment and growth.

Keynesian School: The Keynesian school considers the fraction of population as either myopic or liquidity constrained. The individuals have high propensities to consume. The temporary tax reduction or increase in

government expenditure would increase aggregate demand. As the resources are not fully employed, national income rises due to multiplier effect. This increases the demand for money which increases the interest rates. The increase in interest rate would partially offset the multiplier effect. However it would neutralize by the profitability of investments. The budget deficits have expansionary effects as it results in increase in production which makes investors more optimistic in investment. This leads to crowding in effect. The budget deficits stimulate both consumption and national income. Saving and investment are not adversely affected despite of increase in interest rate. This is due to employment of unutilized resources. However, in the Keynesian paradigm if the resources are fully employed than it would lead to crowding out of investment. Thus the short term effects of appropriately timed budget deficits are beneficial.

Ricardian Equivalence School: The Ricardian equivalence approach advanced by Barro (1989) conceives of farsighted fully informed altruistic individuals. They argue that an increase in budget deficits because of an increase in government expenditure, must be paid for either today or tomorrow. The total present value of receipts is fixed by the total present value of expenditure. Thus, a reduction in present taxes must be equal to an increase in future taxes, leaving interest rates, and thus private investment, unchanged. Thus deficits do not have any impact on aggregate demand and helps in smoothening of expenditure or revenue shocks. Thus it is noteworthy that among three schools one can find support for every conceivable normative position. The budget deficit is good, bad or irrelevant depends on the choice of an analytical perspective. The Neoclassical and Ricardian put emphasis on the long run whereas Keynesian on the short run effects.

5.8.2. Types of Budget deficit

Budget deficit concept admits of several variations and yields divergent types of budget deficit. Each type has analytical and policy relevance. According to the World Bank, the choice of the "correct" measure depends upon the purpose of analysis. There can be different types of deficit in a budget depending upon the types of receipts and expenditure taken into consideration. Accordingly, there are various concepts of budget deficit, namely:

1. Overall Budget deficit
2. Revenue deficit
3. Fiscal deficit
4. Primary deficit
5. Monetized deficit

1. **Overall Budget Deficit**: The conventional measure of budget deficit or overall budget deficit which is the difference between the total expenditure (revenue and capital) and total receipts (revenue and capital).

Overall Budget Deficit= Total expenditure-Total revenue.

This measure was significant to determine the growth of liquidity and inflationary pressure in the economy. The deficit is covered by the borrowings or monetized by the central bank say Reserve Bank of India (RBI) in India. The deficit is only finance through short term sources that includes 91-day treasury bills held by both, the RBI and non-RBI entities. In the presence of the system of automatic monetization of deficits through keep in check. However, in the year 1997, the govt discontinued the issuance of ad-hoc treasury bills. Instead, a scheme of ways and means advances (WMA) by the RBI was introduced to cover the deficit. As a result of this, the concept of budget deficit in the traditional sense lost its significance in public finance i.e. as an indicator of short term requirements of funds or extent of monetization. Thus, budget deficit since 1997-98 budget was not reported in the Budget documents of Government of India, GOI and was discontinued.

2. **Monetized Deficit**: Monetized deficit is that part of the govt deficit which is solely financed by the RBI. It indicates the quantum of additional money created as a result of credit extended to RBI. When the govt has a significant amount of outstanding debt, it can purchase its own debt with new printed money and thus monetized part of its debt. This is financed by borrowings both short and long term from the RBI. The supply of money exceeds its demand driving up the prices leading to the inflationary consequence. Thus, monetized deficits are an important indicator of the inflationary impact of the increase in govt's budgetary deficits. The significance of this deficit is that it is important to regulate and if necessary to reduce the monetized deficit to control inflationary pressures.

3. Revenue Deficit: Revenue deficit is excess of total revenue expenditure of the govt over its total revenue receipts. Revenue deficit signifies that govt's own revenue is insufficient to meet normal functioning of govt departments and provision of services.

Revenue deficit = Total Revenue expenditure – Total Revenue receipts

Revenue deficit means dissaving on govt account. The govt should maintain surplus in the revenue budget so that it increase the savings in the economy. The deficit is to be met from capital receipts, i.e., through borrowing and sale of its assets (disinvestment). Increased borrowing would lead to increase in interest payments which in turn necessitate larger borrowings. The economy would move in the vicious cycle. The borrowed funds from capital account are used to meet generally consumption expenditure of the govt leading to inflationary situation in the economy. Thus, revenue deficit may result either in increasing govt liabilities or in reduction of govt assets. A high revenue deficit warrants that the govt either to curtail its expenditure and avoid unnecessary or unproductive expenditure or increase its tax and non-tax receipts. In the Indian context, a new term 'effective Revenue deficit' was introduced in the Central budget 2011-12. It is the difference between revenue deficit and grants for creation of capital assets. It is also the amount of capital receipts that are being used for actual consumption expenditure of the Govt. This is a new parameter and same is targeted to be eliminated by the 31st March, 2015 as per the Amendment made in 2012 to Fiscal responsibility and Budget Management Act (FRBM Act). However, the 14th Finance Commission observed that the concept of effective revenue deficit is not recognized in the standard govt accounting process. The Commission recommended that the Central Govt should consider making an amendment to the FRBM Act to omit the definition of effective revenue deficit from 1st April 2015.

4. Fiscal Deficit: Fiscal Deficit has replaced the traditional measure of overall budget deficit. Until eighties the fiscal policy focused primarily on the overall budget deficit or deficit financing. With the discontinuation of budget deficit, fiscal deficit became the key indicator of deficit. Fiscal deficit has been adopted by the IMF as the principal policy target in their programmes. In India, the govt began to report the fiscal deficit only after 1991. Fiscal deficit is defined as the difference between the total expenditure including loans net

of repayment and the revenue receipts plus non-debt capital receipts. It indicates the total borrowing requirements of the government from all sources that includes domestic sources like public and commercial banks or from World Bank, International Monetary Fund or from Reserve Bank of India.

Fiscal deficit = Total expenditure – Total receipts excluding borrowings = net borrowings of the government

Borrowings of the government create problem of not only increase in interest payments but also of liability to repay loans. The interest payment increases revenue expenditure creating a higher revenue deficit. The government would be compelled to borrow more leading to emergence of debt trap. Increasing fiscal deficit over a period of time means government expenditure is rising faster than its revenues. A rapid increase in the public debt would increase debt-GDP ratio which would have harmful effects. Government can also borrow from RBI which meets this demand by printing of more currency notes (called deficit financing). It results in circulation of more money. This may cause inflationary pressures in the economy leading to retardation of the economic growth as the borrowings crowds out private investment. Thus, it is necessary to monitor and regulate the fiscal deficit. Fiscal deficit is advantageous if it creates new capital assets that increase the future income. In India, the Fiscal Responsibility and Budget Management Act (FRBM Act) was passed by the parliament in 2003. The aim of this act was to remove revenue deficit of the govt. It binds the government to fix fiscal and revenue deficit targets for itself. The implementation of Fiscal Responsibility and Budget Management (FRBM) Act during the period 2005-10 had helped the Centre and State government to reduce their fiscal deficits to a considerable extent. However, during the global slowdown years (2008-09 and 2009-10) expansionary fiscal policy resulted in fiscal deficit moving up significantly. The 13th Finance Commission had proposed a target of attaining a 3% fiscal deficit (of GDP) for central government by 2013-14 and for State Governments in stages, and in a manner that all states would attain 3 % fiscal deficit (of their GSDP) by 2014-15. The 14th Finance Commission recommended the Centre to maintain its fiscal deficit at 3.6% of the GDP for 2015-16 from 4.1% in 2014-15 and then maintain it at 3% for the following four years.

5. Primary Deficit: Primary deficit is defined as fiscal deficit of current year minus interest payments on previous borrowings.

Primary deficit = Fiscal deficit-Interest payments.

In other words primary deficit indicates borrowing requirement exclusive of interest payment (i.e. amount of loan). The borrowing requirement of the government includes accumulated debt and interest payment on debt. If 'interest payment on debt is deducted from borrowing, the balance is called primary deficit. It shows how much government borrowing is going to meet expenses other than Interest payments. It also shows the net increase in the government indebtedness due to the current year's fiscal operations. A reduction in primary deficit is reflective of government efforts at bridging the fiscal gap during a financial year. Thus, zero primary deficits means that government has to resort to borrowing only to make interest payments. Thus, primary deficit is a narrower concept and a part of fiscal deficit because the latter also includes interest payment. It is generally used as a basic measure of fiscal irresponsibility.

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