



INSTITUTE OF DISTANCE EDUCATION **IDE**
Rajiv Gandhi University



MAECO-402

Macro-Economic Theory

MA ECONOMICS

1st Semester

Rajiv Gandhi University

www.ide.rgu.ac.in

MACROECONOMIC THEORY

MA [Economics]

MAECO - 402

First Semester



RAJIV GANDHI UNIVERSITY

Arunachal Pradesh, INDIA - 791 112

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About the University

Rajiv Gandhi University (formerly Arunachal University) is a premier institution for higher education in the state of Arunachal Pradesh and has completed twenty-five years of its existence. Late Smt. Indira Gandhi, the then Prime Minister of India, laid the foundation stone of the university on 4th February, 1984 at Rono Hills, where the present campus is located.

Ever since its inception, the university has been trying to achieve excellence and fulfill the objectives as envisaged in the University Act. The university received academic recognition under Section 2(f) from the University Grants Commission on 28th March, 1985 and started functioning from 1st April, 1985. It got financial recognition under section 12-B of the UGC on 25th March, 1994. Since then Rajiv Gandhi University, (then Arunachal University) has carved a niche for itself in the educational scenario of the country following its selection as a University with potential for excellence by a high-level expert committee of the University Grants Commission from among universities in India.

The University was converted into a Central University with effect from 9th April, 2007 as per notification of the Ministry of Human Resource Development, Government of India.

The University is located atop Rono Hills on a picturesque tableland of 302 acres overlooking the river Dikrong. It is 6.5 km from the National Highway 52-A and 25 km from Itanagar, the State capital. The campus is linked with the National Highway by the Dikrong bridge.

The teaching and research programmes of the University are designed with a view to play a positive role in the socio-economic and cultural development of the State. The University offers Undergraduate, Post-graduate, M.Phil and Ph.D. programmes. The Department of Education also offers the B.Ed. programme.

There are fifteen colleges affiliated to the University. The University has been extending educational facilities to students from the neighbouring states, particularly Assam. The strength of students in different departments of the University and in affiliated colleges has been steadily increasing.

The faculty members have been actively engaged in research activities with financial support from UGC and other funding agencies. Since inception, a number of proposals on research projects have been sanctioned by various funding agencies to the University. Various departments have organized numerous seminars, workshops and conferences. Many faculty members have participated in national and international conferences and seminars held within the country and abroad. Eminent scholars and distinguished personalities have visited the University and delivered lectures on various disciplines.

The academic year 2000-2001 was a year of consolidation for the University. The switch over from the annual to the semester system took off smoothly and the performance of the students registered a marked improvement. Various syllabi designed by Boards of Post-graduate Studies (BPGS) have been implemented. VSAT facility installed by the ERNET India, New Delhi under the UGC-Infonet program, provides Internet access.

In spite of infrastructural constraints, the University has been maintaining its academic excellence. The University has strictly adhered to the academic calendar, conducted the examinations and declared the results on time. The students from the University have found placements not only in State and Central Government Services, but also in various institutions, industries and organizations. Many students have emerged successful in the National Eligibility Test (NET).

Since inception, the University has made significant progress in teaching, research, innovations in curriculum development and developing infrastructure.

About IDE

The formal system of higher education in our country is facing the problems of access, limitation of seats, lack of facilities and infrastructure. Academicians from various disciplines opine that it is learning which is more important and not the channel of education. The education through distance mode is an alternative mode of imparting instruction to overcome the problems of access, infrastructure and socio-economic barriers. This will meet the demand for qualitative higher education of millions of people who cannot get admission in the regular system and wish to pursue their education. It also helps interested employed and unemployed men and women to continue with their higher education. Distance education is a distinct approach to impart education to learners who remained away in the space and/or time from the teachers and teaching institutions on account of economic, social and other considerations. Our main aim is to provide higher education opportunities to those who are unable to join regular academic and vocational education programmes in the affiliated colleges of the University and make higher education reach to the doorsteps in rural and geographically remote areas of Arunachal Pradesh in particular and North-eastern part of India in general. In 2008, the Centre for Distance Education has been renamed as "Institute of Distance Education (IDE)."

Continuing the endeavor to expand the learning opportunities for distant learners, IDE has introduced Post Graduate Courses in 5 subjects (Education, English, Hindi, History and Political Science) from the Academic Session 2013-14.

The Institute of Distance Education is housed in the Physical Sciences Faculty Building (first floor) next to the University Library. The University campus is 6 kms from NERIST point on National Highway 52A. The University buses ply to NERIST point regularly.

Outstanding Features of Institute of Distance Education:

(i) At Par with Regular Mode

Eligibility requirements, curricular content, mode of examination and the award of degrees are on par with the colleges affiliated to the Rajiv Gandhi University and the Department(s) of the University.

(ii) Self-Instructional Study Material (SISM)

The students are provided SISM prepared by the Institute and approved by Distance Education Council (DEC), New Delhi. This will be provided at the time of admission at the IDE or its Study Centres. SISM is provided only in English except Hindi subject.

(iii) Contact and Counselling Programme (CCP)

The course curriculum of every programme involves counselling in the form of personal contact programme of duration of approximately 7-15 days. The CCP shall not be compulsory for BA. However for professional courses and MA the attendance in CCP will be mandatory.

(iv) Field Training and Project

For professional course(s) there shall be provision of field training and project writing in the concerned subject.

(v) Medium of Instruction and Examination

The medium of instruction and examination will be English for all the subjects except for those subjects where the learners will need to write in the respective languages.

(vi) Subject/Counselling Coordinators

For developing study material, the IDE appoints subject coordinators from within and outside the University. In order to run the PCCP effectively Counselling Coordinators are engaged from the Departments of the University, The Counselling-Coordinators do necessary coordination for involving resource persons in contact and counselling programme and assignment evaluation. The learners can also contact them for clarifying their difficulties in their respective subjects.

SYLLABI-BOOK MAPPING TABLE

Macroeconomic Theory and Monetary Economics

Syllabi

Mapping in Book

Unit I: Review of Classical and Keynesian Economics

Classical theory of income, employment, wage rate and price level - macroequilibrium in classical model - Classical dichotomy - Causes of unemployment - Evaluation of classical model.

Keynesian determination of income, output and employment: Consumption function, investment multiplier and balanced budget multiplier - Multiplier in an open economy; difference between Keynesian and classical macro-equilibrium, Pigou's critique of Keynes's under employment equilibrium - the Pigou effect.

Unit II: Neo-Classical and Keynesian Synthesis

Classical and Keynesian theories of interest: IS-LM model - Relative effectiveness of monetary and fiscal policies - Extension of IS-LM model to labour market, flexible price, Mundell-Fleming model of an open economy.

Unit III: Theories of Consumption

Extension of Keynesian consumption function to long run - Relative Income Hypothesis - Life Cycle Hypothesis - Permanent Income Hypothesis.

Unit IV: Theories of Investment

Investment demand: Present value criterion for investment, payback period and internal rate of return, Marginal Efficiency of Investment (MEI). Acceleration principle, its derivation from the profit maximizing behaviour, flexible accelerator.

Unit V: Theories of Trade Cycle

Schumpeterian Theory: Multiplier-accelerator interaction - Kaldor's theory - Monetary and fiscal policy for economic stabilization.

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- 1.8 Theory of Multiplier

UNIT 2 NEO-CLASSICAL AND KEYNESIAN SYNTHESIS

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UNIT I: Review of Classical and Keynesian Economics

Structure

- 1.1 Introduction
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 - 1.3.1 Classical Theory of Employment and Output
 - 1.3.2 Product market equilibrium
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1.1 Introduction

This unit deals with Classical and Keynesian approaches to solve macroeconomic problems. In this unit an attempt has been made to discuss about various approaches related to the determination of income, output, employment and rate of interest. This unit is divided into two parts. In the first part, we have made an attempt to discuss the Classical theory of employment, output, price and rate of interest. In the second part, we have attempted to discuss the Keynesian theory of employment, output, rate of interest and multiplier.

1.2 Objectives

The objective of this module is to impart the learners about the Classical and Keynesian approaches to determination of income, output and employment.

1.3 Classical Macroeconomics

The study of Classical theory of income and employment determination is important because some of the

aspects of classical theory are relevant to the prevailing condition of the developing countries. Classical economics dominated the mainstream economics from 18th century to 1930s. The classical theory, propounded by Adam Smith, J.B. Say and David Ricardo, assumes that there is always full employment in the economy. They believed that when there is any unemployment in the economy, certain forces automatically operate in such a way that the full employment is restored. The classical analysis was based on Say's law of market that states "Supply creates its own demand" which implies that there is no possibility of general over production in the long run. The classical economists emphasised that the free-market economy has a tendency towards the establishment of full employment of labour and there is always sufficient demand in the market for the product produced.

While the Keynesian theory emphasizes on the role of effective demand in determining the income and employment, the classical economists believed that the free-market economy has a tendency towards the establishment of full employment of labour and there is always sufficient demand in the market for the product produced.

The main propositions of the classical theory of employment are mentioned below:

- a. Full employment is the normal feature of the capitalist economy. The full employment situation always prevails in a normal economy. The economy is said to be in equilibrium only if it is operating at full employment.
- b. In the full employment, there may exist voluntary, frictional unemployment, seasonal unemployment and structural unemployment in the economy.
- c. Flexibility of wage, prices and interest rate along with the existence of perfectly competitive factor, product and capital market ensure the maintenance of full employment in the economy.
- d. In the long run, there is no possibility of over production or unemployment in the economy.
- e. There should not be government interference in the production process of the economy which will ensure a smooth functioning of the market and the full employment can be maintained.
- f. People spend their whole income either on consumption or investment.

The following are the main assumptions of Classical theory of Employment and output:

- a. All economic agents are rational and are motivated by self-interest.
- b. Perfect competition exists in product market, factor market and capital market.
- c. Economic agents do not suffer from money illusion.
- d. Laissez faire condition prevails in the economy which implies that the government does not interfere in the economic activities.
- e. There is a closed economy without international trade.
- f. Money is a medium of exchange.
- g. All the ideas are based on the long run

h. There is no technological progress.

1.3.1 Classical Theory of Employment and Output

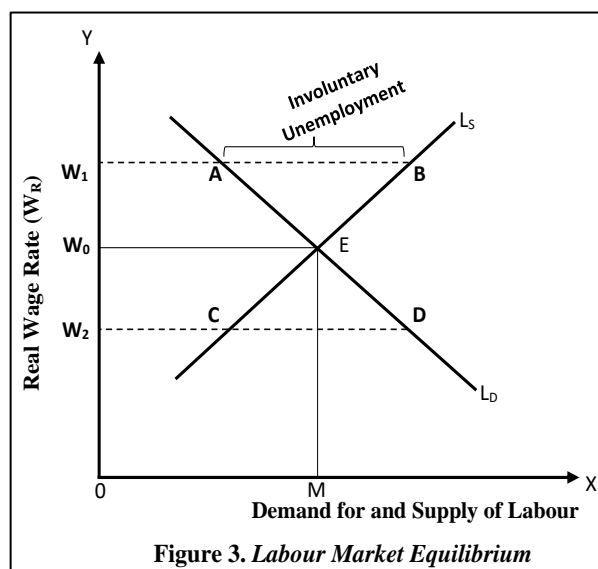
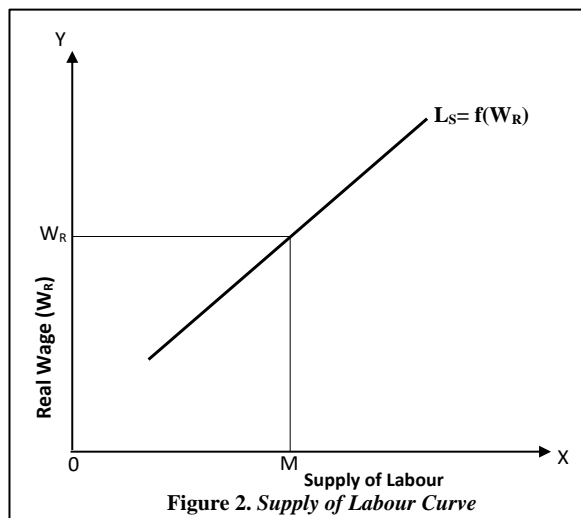
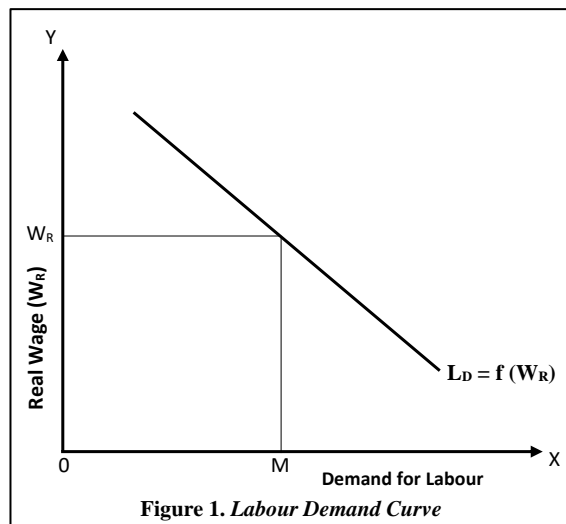
According to the classical theory of employment, the level of full employment is determined by the equilibrium of the labour market. The level of full employment is determined at the level where the Labour demand is equal to the labour supply. In fact, the labour market equilibrium helps us to determine the equilibrium wage rate and the equilibrium employment. In the successive section, we will derive the labour demand curve, labour supply curve and the equilibrium of labour market.

Labour Demand curve: The classical theory assumes perfect competition in both factor market and product market. Also assumes that a firm which undertake production decision aims at maximisation of profit. Thus, profit maximising firm will employ labour until the Marginal product of labour (MP_L) becomes equal to the given real wage rate (W/P). The demand function of labour can be written as:

$$L_D = f\left(\frac{W}{P}\right) = f(W_R)$$

For our simplicity, let us assume that the relationship between the real wage (W_R) and the Labour demand (L_S) is negative and linear and the Labour demand curve is presented in Figure 1.

Labour Supply curve: The supply of labour is a function of real wages. Real wage (W_R) is defined as W/P (where W is nominal wage rate and P is the price level). The relationship between labour supply and real wage is given by the *law of labour supply* which states that **supply of labour increases with increase in the real wage rate**. As is widely known, this relationship holds only till the point of work-leisure trade-off. In general, the labour supply function and labour



market equilibrium helps us to determine the equilibrium wage rate and the equilibrium employment.

supply curve are based on the assumption of positive relationship between real wages and labour supply; thus, the labour supply curve slopes upward from the left to right and in functional form this relationship can be written as:

$$L_S = f\left(\frac{W}{P}\right) = f(W_R)$$

For our simplicity, let us assume that the relationship between the real wage (W_R) and the Labour supply (L_S) is positive and linear and the Labour supply curve is presented in Figure 2.

Labour Market Equilibrium: The determination of labour market equilibrium and the real wage is shown in the following figure. Labour Demand and Labour Supply curves are represented by L_D and L_S respectively. The OX axis represents the Demand for and Supply of labour and the OY represents the Real wage. In the figure 3, it is seen that the equilibrium of labour market is achieved at point E where the labour demand and labour supply are equal. At the equilibrium level, the labour employed is OM which ensures the full employment level of employment. Also, the equilibrium level of real wage is determined at OW_0 .

If the real wage say W_1 is more than the equilibrium wage (W_0) the excess supply of labour will emerge and as a result AB unit of labour will be unemployed. Given the competition among the workers, the excess supply of labour would cause the wage rate to fall to the equilibrium level OW_0 at which the labour market will be cleared. On the other hand, if the real wage rate say W_2 is below the equilibrium wage rate of W_0 , then the firm will demand more labour than is offered at the existing real wage rate (excess demand for labour of amount CD). As a result of the competition among the firms to hire labour desired by them, the wage rate would go up to the equilibrium level W_0 . At W_0 all those who offer their labour services are in fact demanded and employed. *It therefore follows that at the real wage rate W_0 , there is no involuntary unemployment or there prevails full employment (given wage flexibility).*

Classical Unemployment is such type of unemployment, which occurs when the real wages of the worker in an economy is sharply high. For this reason, classical unemployment is also known as real wage unemployment. The high real wage means the higher cost of employing an additional worker than the benefits from his employment. When the real wages are too high firm are not in a profitable state from the employment of the labour. So, firm in the classical economy are not willing to employ every person for the job.

Following are some causes of classical unemployment:

- a. The existence of trade unions and their bargaining policies: Strong trade unions always bargains for the higher price than the equilibrium price.
- b. Minimum wages: The minimum wage policy also creates the problem of unemployment by making labour costly according to classical viewpoint.

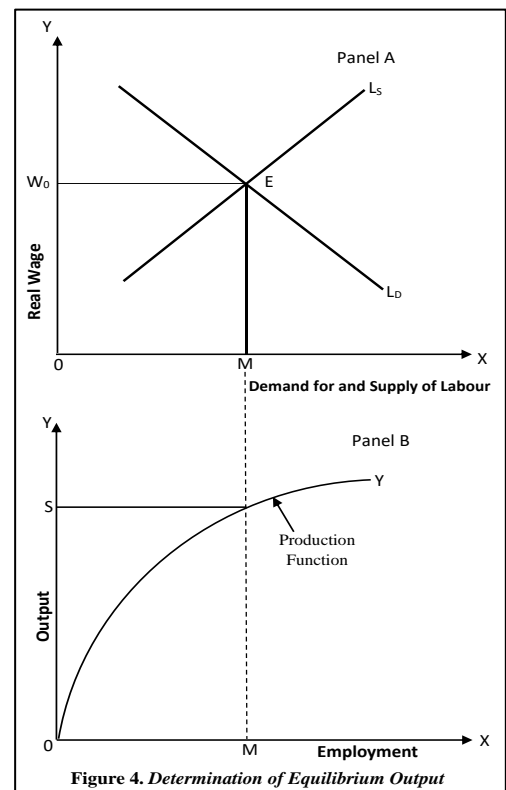
- c. Sticky wages during deflation period. Deflation is a period, when price starts falling, so necessary wage cut policy is adopted in order to maintain full equilibrium in the economy. But the workers always prefer to avoid the nominal wage cut and thus the problem of unemployment is caused.

According to the classical economist the problem of unemployment could be solved by making wages more flexible.

Determination of Real Output or Income (Real GDP): Let us proceed to the determination of real GDP. Given the short run production function and full employment situation, we will be able to find the equilibrium level of output or income. In figure 4.B the production function is plotted. We will determine the Full employment level of output from the labour market equilibrium situation, plotted in figure 4.A. For this purpose, we assume that the stock of capital and the technology is given or unchanged.

The production function in figure 4.B depicts that, given capital and technology, as more of the labour is employed the level of output increases at a diminishing rate and this phenomenon is known as *the diminishing returns to a factor*. In the above figure, 4.A, it is shown that, given the level of technology and capital, at the full employment level of labour (OM), the economy will produce an output equal to OS level of output which is the full employment level of output. This OS level of output will constitute the level of income of the society and will distributed among the members of the society in the form of wage (to the labour) and profit (to the enterprises). Thus, under classical regime the total output or the income (OS) is the sum of wage and profit.

An important feature of the classical model is that factors operating on the supply side of the market determine the level of employment and output. As shown above, labour market equilibrium is determined by the demand for and supply of labour. The labour demand curve is, however, derived from the Marginal productivity of labour (MP_L) curve. Also, according to classical theory, it is the labour supply, which is a function of real wages, that plays a more important role in the determination of the labour market equilibrium and employment. And, employment determines the level of output. Thus, in the classical model, employment and output are determined solely by the factors operating on the supply side of the labour market.



1.3.2 Product market equilibrium

The product market equilibrium is attained at an overall price level where the Aggregate Demand and the Aggregate Supply are equal. Under classical economy, the aggregate supply (AS) is assumed to be fixed and has nothing to do with the price level. Given the full employment of labour (OM in figure 4.A), the production function determines the full employment level of output (OY in figure 4.B). The OY amount of full employment output in figure 4.B is potential GDP at full employment or the Aggregate supply of the economy. Since, the equilibrium level of labour is fixed at OM level which can produce OY output, the real output or the income will be fixed at OY level. Thus, the aggregate supply will be fixed at OY level and the Aggregate Supply Curve (AS) is vertical and parallel OY axis (perfectly inelastic).

The relationship between price level and the aggregate demand is inverse; in other words, keeping other things unchanged, an increase in the price level causes the quantity demanded to fall and vice versa. Thus, the aggregate demand curve (AD) is downward sloping from left to right.

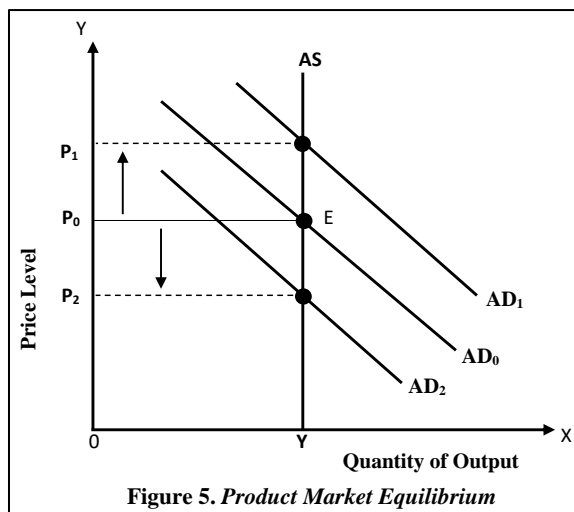
In the Figure 5, it is seen that the aggregate demand (AD) and aggregate supply (AS) curves are intersecting each other at point E and thus, the equilibrium price level (P_0) and equilibrium full employment output (OY) are determined.

Aggregate demand is the sum of Consumption expenditure (C) and the private investment expenditure (I). Again, on the other hand, Aggregate supply (AS) is the GDP which can be used for either consumption (C) or Saving (S). Thus, in equilibrium We can write it as:

$$AD = AS$$

$$C + I = C + S$$

$$I = S$$



So, for the economy to be in the full employment level, it is essential that saving is equal to investment. Saving is the leakage out of the spending stream and private investment is injection to the spending stream. Thus, so long as the Injection is equal to the leakage, the economy will be in equilibrium.

Now, given the full employment (aggregate supply fixed) situation, any increase in the aggregate demand (AD) will lead to a proportional increase in the price level. In other words, an increase in the aggregate demand by K times will lead to an increase in the price level by K. In the above diagram (Figure 5), it is observed that, when the aggregate demand increases from AD to AD₁, the price has

increased from P_0 to P_1 . On the contrary, a fall in the aggregate demand by K times will lead to a fall in the price level by K times. As in the diagram above (Figure 5) it is seen that, when the aggregate demand falls from AD to AD_2 , the price level has fallen from P_0 to P_2 .

1.3.3 Capital market equilibrium

In the above section, showing the *Product Market Equilibrium*, for the maintenance of full employment level of output, it is necessary that the level of saving and investment are equal. According to the classical economists, rate of interest is the factor which brings an equality between the saving and investment. Further, they stated that the rate of interest is determined by demand for investment funds and supply of investible funds (saving) in the capital market.

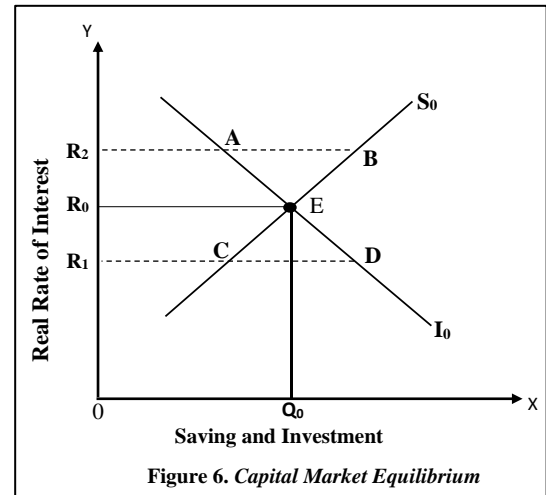
The demand for investment fund is an inverse function of the rate of interest. In other words, at a low rate of interest, more funds will be borrowed for the investment purposes and at a higher rate of interest, less funds will be borrowed for the investment purposes. Thus, there is a negative relationship between the rate of interest and the demand for investible fund.

The supply of investible fund comes from the saving of the individual which is a positive function of the rate of interest. In other words, at a higher rate of interest, more investible funds will be supplied (or more saving will take place) and at a lower rate of interest, less funds will be supplied (or less saving will take place). Thus, there is a positive relationship between the rate of interest and the saving.

In Figure 6, the OX axis measures demand for and supply of investible fund, and OY axis measures the rate of interest. It is seen that the demand for investment demand curve I_0 is negatively sloped because there is a negative relationship between rate of interest and the demand for investible funds. On the other hand, the supply of investible funds curve or the saving curve (S_0) is positively sloped because of the fact that there is a positive relationship between rate of interest and saving.

The demand for investment curve (I_0) and saving curve (S_0) intersects each other at point E where the equilibrium is achieved. Corresponding to this equilibrium point, the equilibrium rate of interest is determined at OR_0 level and the equilibrium amount of investment and saving is determined to be OQ_0 .

At a higher rate of interest, say R_2 , the investment demand is less than the supply of investible funds. Due to the excess supply (AB amount) of saving the rate of interest will fall to OR_0 level. On the other hand, at a lower rate of interest, say R_1 , the demand for investment exceeds the supply of savings (by CD amount). Now, due to the excess demand for investment in the capital market, rate of interest would go



up. Thus, it is the rate of interest R_0 which keeps the capital market in equilibrium, i.e., saving is equal to investment ($S=I$).

1.3.4 Say's Law

The Say's law of market, propounded by the French Economist J. B. Say, states that 'supply creates its own demand'. It implies that every production of goods also creates incomes equal to the value of the goods produced and these incomes are spent on purchasing these goods. Thus, greater production automatically leads to a greater money income which creates the market for the greater goods produced. This means that there will be no general overproduction (or glut) in the market. And consequently, there will be no problem of deficiency of aggregate demand. This law can be explained in the context of both *barter system* and *monetised system*.

In a *barter economy*, people tend to specialise in the production of goods which they can produce relatively more efficiently, though they consume many other goods. They acquire other goods and services they consume in exchange for their own produce. When they offer their produce in barter for other goods, they create demand for other goods. In this kind of an economy, there cannot be overproduction or overproduction. The reason is that in the barter economy, people produce goods for own consumption. They produce what they consume and they produce as much as they consume.

This law applies equally well to the *monetized economy*. According to this theory the income which is saved and not used to purchase consumer goods will become investment expenditure. And therefore, the investment will be equal to saving. Further, the leakage in the income flow caused by the saving will be made up by the investment. Given the productive capacity is utilised at full capacity, there will be no problem of demand deficiency or market glut.

Say's law is based upon the following assumptions:

- a. The amount of labour and capital can be raised in a free-market system based on price mechanism.
- b. In an expanding economy new firms and labourers can have easy entry by offering their products in exchange without dislocating the position of existing firms and labourers.
- c. The size of market is capable of expansion.
- d. All savings are automatically invested, i.e., savings always equals investment.
- e. The Government does not interfere in the functioning of the economy.

Implications of Say's Law:

- a. Since there is automatic adjustment between production and consumption, there is no need for the government to interfere in the functioning of economic system. Any interference by the

government in the automatic functioning of the economic system will simply create imbalances and disequilibria.

- b. When the unemployed resources are employed, they lead to more production which covers their own costs. Hence, the economy will operate at the level of full employment.
- c. The mechanism of interest flexibility brings about an equality between savings and investment.
- d. The mechanism of wage- flexibility brings about full employment.

1.4 Keynesian critic of Classical Theory

The classical economics prevailed until the Great Depression of 1930s, and it had prevailed because it was never tested by any big changes in economic conditions over time. However, the Great Depression has proved that the classical theory was fundamentally not correct to the prevailing economic situation.

Keynes in his book *General Theory of Employment, Interest and Money* criticized the classical theory of employment and output. The broad criticisms made by Keynes against the classical theory are discussed in the below sub-sections.

- a. **Keynes challenged Say's Law:** Keynes criticized and proved the Say's law invalid in real practice. According to Say's law, the production creates its own demand and thus, whatever is produced is sold ultimately. Thus, there is no problem of general overproduction in the economy. It is because supply creates demand for goods because the productive factors, which are involved in the production activity, earn income from production equal to the value of goods they produce. But, in reality this is not the case because the entire income earned by the factors may not be spent on the purchase of these goods and services. A part of income may be saved and thus, this part will not create demand for goods and services. If the firm do not invest equal to the desired saving, then the aggregate demand without government intervention will not be enough to purchase the available supply of output. Hence, if aggregate demand is not sufficient to purchase the available supply, the producers would be unable to sell their whole output due to which their profits would decline and as a result they would reduce their level of production giving rise to involuntary unemployment in the economy.

Keynes also explained that equality between saving and investment cannot be brought about a change in the rate of interest but by the level of income. But classical economists ignored the change in the level of income because of their assumption of full employment.

Keynes emphasised on the fact that there is no guarantee that sum of consumption expenditure and investment expenditure are necessarily equal to the value of output produced in the economy. Hence, it is not necessary that the economy will be in equilibrium at the level of full employment. This invalidates Say's law, since according to it over-production and unemployment cannot occur in the economy and full employment is always maintained.

- b. **Keynes proved Pigou's view that a cut in wage will restore the full employment in as fallacious.** The classical economists held the view that during depression, fall in wage and prices in the market will eventually restore the equilibrium and remove the unemployment if the market is allowed to operate freely without any government intervention. Keynes put forward his view that the wage is not only a cost of production but also the income to the labour. So, a fall in the wages will ultimately leads to a fall in income of the workers and in turn the aggregate demand will fall. As a result of decline in aggregate demand, the employment decline and the unemployment will increase.

One fundamental difference between Pigou and Keynes is that Pigou considered the level of employment as a function of money wage, therefore, a reduction in money wage rate triggers the level of employment. On the other hand, Keynes considered the level of employment as a function of aggregate demand, and the aggregate demand falls with a cut in the money wage.

- c. **Sticky wage and Unemployment:** The basic argument of the classical theory is that the prevalence of full employment is a normal situation in a free market economy. Any deviation from the full employment level of output is only possible in short run and is corrected by the wage and price flexibility mechanism. On the other hand, Keynes explained that the unemployment existed during the depression is due to the fall in aggregate demand. Also argued that the prices and wages are not flexible, thus, sticky. As a result of this, the involuntary unemployment problem emerges.

1.5 Keynesian theory of employment and income

During the period of 1930s, the great depression occurred in the capitalist countries and as a result, the national income fell down. Due to this, many factories either fully closed down or were not working at their full capacity. This problem of depression did not seem to disappear automatically and in turn, the classical theory of full employment proved to be empirically wrong. In this background, Keynes published his book titled *General Theory of Employment, Interest and Money* in the year 1936, in which he attacked the classical views for not dealing with the economic problems of the real world properly.

The Keynesian economics differs drastically from the Classical Economics in terms of assumptions, presentation of tools of analysis and policy measures. Keynesian analysis has significantly influenced policy matters in the capitalist economies of the world.

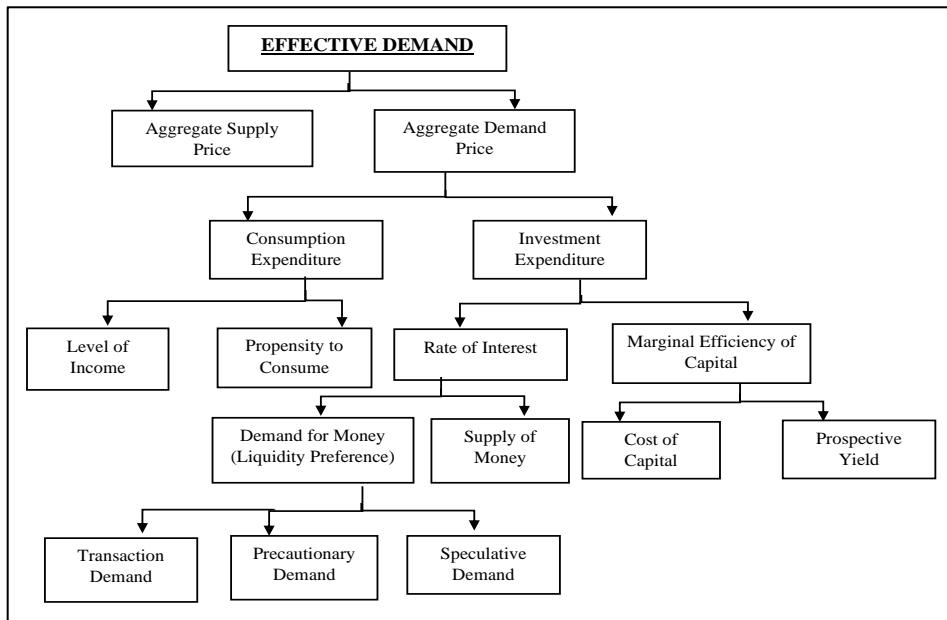
The Keynesian theory employment and income determination occupies a very important role in the present economic structure. According to Keynes, in an advanced capitalist economy, the level of employment is a function of effective demand. *Effective Demand* is the obtained at a point where the *Aggregate Supply Function* is equal to the *Aggregate Demand Function*. According to this theory,

unemployment arises due to the deficiency in the effective demand. The following are the **main propositions** of Keynes theory of employment:

- a. The Keynes theory is based on the proposition that Total Employment (L) = Total Output (Q) = Total Income (Y). It means that, increase in employment raises the total output which leads to an increase in the level of income in same proportion.
- b. The employment is a function of effective demand which means, the employment will increase with the increase in effective demand.
- c. Investment expenditure is a function of rate of interest and the Marginal Efficiency of Capital (MEC).
- d. Marginal Efficiency of Capital (MEC) is determined by the supply price of capital assets and its perspective yield.
- e. Rate of interest is a monetary phenomenon and is determined by the equality between the demand for and supply of money.

The following are the main assumptions of Keynes theory of employment:

- a. Keynes analysis is based in the phenomenon of short run.
- b. There is a perfect competition in the market.
- c. The analysis deals with the closed economy without foreign trade.
- d. The analysis is based on the law of diminishing returns to factor.
- e. It assumes that the economic agents have money illusion. It means that, ignoring the change in real wage, when the nominal wage increases the workers feel better irrespective of the fact that price has also increased by same proportion. Thus, workers feel better if the money wage increases along with the price (real wage remain constant).



Keynes theory of employment can be summarized using the following chart:

1.5.1 Determination of equilibrium level of employment

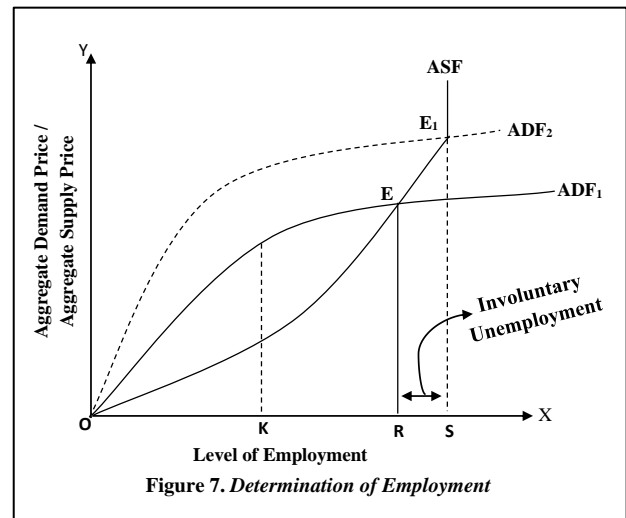
Before dive into the analysis of determination of employment using effective demand analysis, let us first know the meaning of *Aggregate Demand Price* and *Aggregate Supply Price*.

Aggregate Supply Price: Aggregate supply price, at any given level of employment, is the total amount of money which all producers taken together must expect to receive from the sale of output produced. Aggregate supply function shows the relationship between the number of labours employed and the receipt which all firms must get, keeping price constant, from the sale of the output produced using that amount of output.

Aggregate Demand Price: According to Keynes, it is the Aggregate Demand function which plays the most crucial role in the determination of the employment level. It shows, at a given level of employment, some of money a firm expects to get from the sale of the output produced using that level of output. Aggregate demand broadly has four components: (a) Consumption Expenditure, (b) Investment Expenditure, (c) Government spending, and (d) Net export. But for now, we will not incorporate the net export component since the economy we are considering is a closed economy.

The analysis of effective demand is the logical starting point of Keynes theory of employment. This theory determines the level of employment in an economy. The theory can be explained with the help of the following diagram.

In Figure 7, the level of employment is measured on the horizontal (OX) axis and Aggregate Supply price and Aggregate Demand price. The ASF and ADF represent the aggregate supply function and the aggregate demand function respectively. The equilibrium level of employment is determined at point E where the ADF₁ is equal to the ASF and is also known as the point of **effective demand**. The equilibrium level of employment is OR. At this level of employment, the Aggregate demand price and aggregate supply price are equal, and at this level, the producers will maximise their profits and have no tendency to increase or decrease the level of employment. If the economy deviates from the equilibrium level, the economy will automatically move towards the equilibrium level. Suppose, at OK level of employment, the ADF > ASF, thus, the expected receipt is greater than the expected cost. Thus, will induce the producers to increase employment. On the other hand, at OS level of employment, the expected cost is greater than the expected receipt (ADF < ASF). In such situation the employment will be cut and the equilibrium level of employment OR will be restored.



If the economy deviates from the equilibrium level, the economy will automatically move towards the equilibrium level. Suppose, at OK level of employment, the ADF > ASF, thus, the expected receipt is greater than the expected cost. Thus, will induce the producers to increase employment. On the other hand, at OS level of employment, the expected cost is greater than the expected receipt (ADF < ASF). In such situation the employment will be cut and the equilibrium level of employment OR will be restored.

Underemployment Equilibrium: It is not necessary that the equilibrium level of employment is always at full employment. Keynes stated that an economy can achieve equilibrium even at a less than full employment level. In the Figure 7, it is seen that the equilibrium is achieved at point E where the level of employment determined is OR. But even at this level of employment, RS amount of labour will remain unemployed.

Thus, equilibrium at point E is underemployment equilibrium. This RS level of unemployment is involuntary unemployment, that is these people are willing and able to work at the given wage rate but they are not getting any work. This is the notable point of Keynes analysis that existence of this involuntary unemployment is due to the deficiency of aggregate demand. This unemployment can be removed and full employment level of employment OS can be achieved by increasing the aggregate demand through expansionary fiscal policy (increasing government expenditure). Any increase in Aggregate demand will shift the ADF curve upward. So, when the Aggregate demand is raised the ADF curve will shift from ADF₁ to ADF₂ and will intersect the ASF curve at point E₁. At this equilibrium level, the level of full employment is determined to be OS.

According to Keynes, when the investment demand falls short of the gap between full employment level of income and consumption expenditure, recession arises and in turn, this will lead to an increase in the level of involuntary unemployment.

1.5.2 Determination of equilibrium level of income and output

We already have discussed the process of determination of equilibrium level of employment under Keynesian regime using effective demand analysis.

Keynes theory is based on the short run and thus, the change (increase or decrease) in the level of income takes place only as a result of change (increase or decrease) in the level of employment.

The effective demand determined the level of employment, output and income of an economy. At the point of effective demand, the aggregate Demand (Aggregate Expenditure) and aggregate

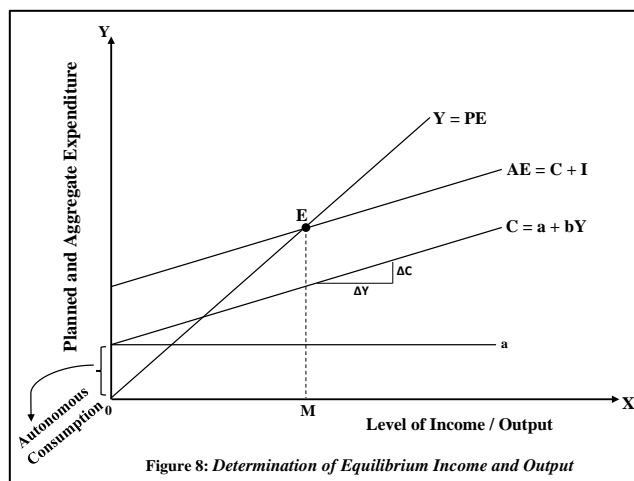


Figure 8: Determination of Equilibrium Income and Output

supply (Planned Expenditure) are equal. At this equilibrium level, the economy as a whole produces that level of output, generates that level of income using that level of employment which is the most profitable. The most profitable level of employment and income is determined by the aggregate demand function, also, the aggregate supply adjusts to the change in the aggregate demand. Thus, the main implication of Keynesian theory is that the demand creates its own supply which is completely opposite to the Say's law.

In this part, we will see the process of income determination through *Keynes's income-expenditure analysis*. In this part, to analyze the process of income determination we will consider a simple two sector economy having only household sector and business firm keeping the price level fixed. Using Figure 8, let us understand the Keynesian theory of income determination.

In Figure 8, the OX axis indicates the level of income and the OY axis measures the Aggregate expenditure and Planned expenditure (Aggregate supply and aggregate demand). The curve C represent the Consumption Expenditure which is an increasing function of level of income i.e., $C = f(Y)$. AE line represent the Aggregate expenditure which is a sum of Consumption expenditure (C) and investment expenditure (I), (i.e., $AE = C + I$). Keynes emphasized on the autonomous investment which is independent of the level of income. Therefore, AE line is parallel to the curve C. The PE curve indicates the planned expenditure or aggregate supply schedule (a 45° line).

The equilibrium is achieved at point E where the $PE=AE$ and it is also the point of effective demand. At this point, Total income is exactly equal to the total expenditure ($Y=C+I$), also, total saving is equal to the total investment ($S=I$). At this equilibrium point E, the OY of output will be produced.

At any output less than OM level, the economy will not be in equilibrium since the aggregate

expenditure (Aggregate demand) is greater than the planned expenditure (Aggregate supply). This will lead the firms to sell the goods from their inventories, and the size of the size will decline. This unintended decline in the size of inventories will trigger to firms to expand their operations to meet the excess demand for goods and services and to keep the size of the inventories at the desired level. Thus, to increase the level of output the employment of labour will also rise. This process of expansion will continue till the national income reaches its equilibrium level of OM.

On the other hand, if the national income goes beyond the OM level, the aggregate supply (planned expenditure) will be higher than that of the aggregate expenditure. It represents that the size of inventories will increase which is unintended for the producers. Therefore, they will cut down the production by cutting down the level of employment. This, in turn, lead to a fall in the national income to the equilibrium level of OM.

Summary of Keynesian Theory of Income and Employment: It is, thus, clear that national income and employment in the short run are determined by effective demand (or, in other words, effective aggregate expenditure). The higher the level of effective demand, the greater the levels of national income and employment and vice versa. According to Keynes, unemployment is due to deficiency of effective demand and the basic remedy to remove this unemployment is to raise the level of effective demand. Keynes proved why the problem of involuntary unemployment was common in the free-market capitalist economies.

Policy Implication of Keynes Theory of Income and Employment:

Keynes's theory has important implications in raising the national income and the level of employment in the economy. When the economy is at less than full employment equilibrium, there will be a problem of depression or recession. According to Keynes, the recession or depression occurs only because of the lack of the aggregate effective demand. There are two policy approaches namely, fiscal and monetary policy, which help in overcoming such deficiency in aggregate effective demand.

Under monetary policy, during recessionary situation, the central bank of the nation (Reserve Bank of India in India) increases money supply using various tools which in turn reduces the rate of interest. This falling rate of interest increases the private investment which raises the aggregate demand and thereby, the aggregate effective demand will increase. This will raise the level of equilibrium employment and the economy will attain full employment level of employment. But Keynes had serious doubt about the effectiveness of monetary policy. He held the view that during recessionary situation, the rate of interest become very low. Therefore, expansionary monetary policy fails to reduce the rate of interest further. This situation is known as the liquidity trap, where people start keeping the asset in form of cash. Since the rate of interest do not fall, the investment does not increase and as a result the Aggregate demand does not increase.

In view of ineffectiveness of monetary policy, Keynes put emphasis on the role of fiscal policy in curing recession/depression and removing involuntary unemployment. A major fiscal policy measure is the increase in expenditure by the Government in times of depression. The increase in Government expenditure will cause an increase in the aggregate demand curve. This increase in aggregate demand will bring about increase in employment and output. If the increase in Government expenditure and as a result rise in aggregate demand is sufficient, it will help in achieving equilibrium at full-employment level. As a result, depression and involuntary unemployment will be eliminated.

Another fiscal policy measure is to cut tax rates which will raise the level of employment and output by raising the level of aggregate demand. When the tax rate is cut, the disposable income of the people increases which increases the consumption expenditure. This in turn again raises the level of aggregate demand and thereby the aggregate effective demand.

Thus, the expansionary fiscal policy raises effective aggregate demand which shifts the aggregate demand price curve upward which will eliminate the involuntary unemployment in the economy and the full employment equilibrium is restored.

1.6 Keynesian theory of consumption

J. M. Keynes was the first to develop a systematic theory of consumption of the household. However, after the Second World War, this theory was challenged on the ground that the consumption expenditure depends not only on the current income, but also on the multiple other factors like rate of interest, wealth etc. This led to a prolonged debate on the issue as to what determines the level of consumption which resulted in the significant contributions to the theory of consumption. The Keynesian theory of consumption is known as *Absolute Income Hypothesis*. Keynes assumed that the consumption expenditure of an individual or a household depended solely on the absolute level of his current income. While Keynes recognized that many other factors like rate of interest, wealth etc. influence the level of consumption, he emphasized that it is the current level of income on which the consumption expenditure of the society and individuals mainly depends.

About consumption behaviour, Keynes makes three points. *Firstly*, consumption expenditure depends mainly on the absolute current income. The consumption expenditure is a positive function of the level of income; with the increase in the level of income in period one, the level of consumption expenditure increases in the same period. *Secondly*, he propounded the psychological law of consumption. It states that when the level of income increases, the consumption also increases but not by as much as the increase in income. It reflects that the Marginal propensity to consume is less than one and greater than zero (i.e., $0 < MPC < 1$). The psychological law of consumption indicates that the increase in income results in the increase in both saving and consumption. *Thirdly*, the consumption expenditure does not have a proportional relationship with the increase in the level of income. As income increases, the proportion of

total income that is spent on the consumption declines. Also, as income falls consumption does not fall proportionately. This is because people protect their consumption standards by not reducing their consumption proportionately to the reduction in their income. Thus, the third proposition of Keynes theory states that with the increase in income level, the *Average Propensity to Consume (APC)* declines.

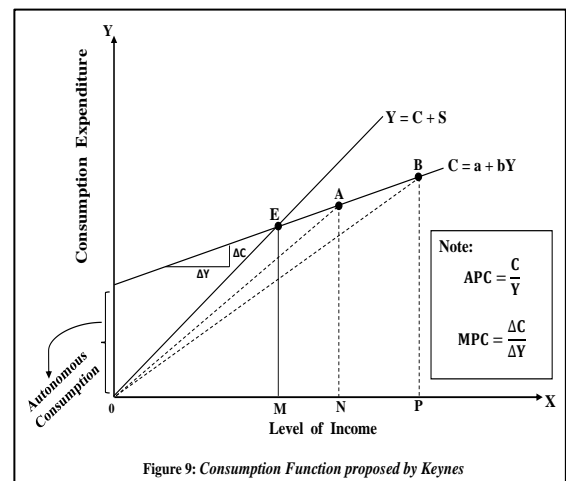
The Keynesian consumption function can be expressed as follows:

$$C = a + bY$$

Here, C is consumption expenditure, a is autonomous consumption, b is MPC and Y is level of disposable income.

The main features of the Keynes theory of consumption are mentioned below:

- a. Absolute level of current income is the important factor that determines consumption of the community. Increase in national income causes an increase in consumption. According to Keynes, though rate of interest is one of the factors that determine consumption of the community, he did not consider it a very important determinant of it.
- b. The second important feature of Keynes' consumption function is that marginal propensity to consume is less than one but greater than zero ($0 < MPC < 1$). As has been explained above and is known as Keynes's psychological law of consumption.
- c. In Keynes's consumption function, namely $C = a + bY$, as income increases, average propensity to consume (APC) falls, Keynes was of the view that rich people relatively save a higher proportion of their income so that at higher levels of income average propensity to consume (APC), that is, proportion of total consumption to national income falls as national income rises.
- d. Another important feature of consumption function as put forward by Keynes is that it remains stable in the short run. Consumption function, according to Keynes, depends on various institutional factors such as distribution of income and wealth and psychological factors such as willingness to save. Since there cannot be much changes in these institutional and psychological factors, consumption function remains stable in the short run, that is, it does not shift upward or downward. Therefore, Keynes in his theory explains the determination of income and employment in the short run by considering that the consumption function is stable.



After acquiring these ideas about the functional relationship between level of income and consumption, let us now explain the short run consumption function with the help of the diagram.

In Figure 9, we have shown a linear consumption function with an intercept term. In this form of linear consumption function, though marginal propensity to consume ($\Delta C/\Delta Y$) is constant, average propensity to consume is declining with the increase in income ($EM/OM > AN/ON > BP/OP$) as indicated by the slopes of the lines OA and OB at levels of income N and P respectively.

The straight-line OB drawn from the origin indicating average propensity to consume at higher income level P has a relatively less slope than the straight-line OA drawn from the origin to point A at lower income level N.

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

Limitation of the Absolute Income Hypothesis: The Absolute Income Hypothesis is based more on "introspection" than on empirical evidence. Empirical investigations show that consumption expenditure exhibits proportionality with income in time series data over a longer period, but it displays non-proportionality for short periods as well as in cross section data. The Keynesian hypothesis, which states a non-proportional link between income and consumption, is contradicted by this. Because the Absolute Income Hypothesis failed to explain the empirical data, a slew of other theories (such as Relative Income Hypothesis, Permanent Income Hypothesis, and Life Cycle Hypothesis) arose to reconcile the proportional and non-proportional relationships between aggregate consumption and aggregate disposable income.

1.7 Keynesian theory of interest

In Keynesian theory, the rate of interest is determined by equalizing the aggregate demand for money and total supply of money. The equilibrium rate of interest is determined at the point where the money market is also in equilibrium. According to Keynes, the supply of money is determined exogenously by the central bank of the country. So, the supply of money is assumed to be fixed and independent of the rate of interest.

On the other hand, the demand for money, according to Keynes, comes from individual and business firms for different motives. He classified these motives into three broad categories as (a) Transaction Motive (L_T), (b) Precautionary Motive (L_P), and (c) Speculative motive (L_2). Before discussing about the money market equilibrium and determination of rate of interest, let us first understand the three motives of demand of money in brief.

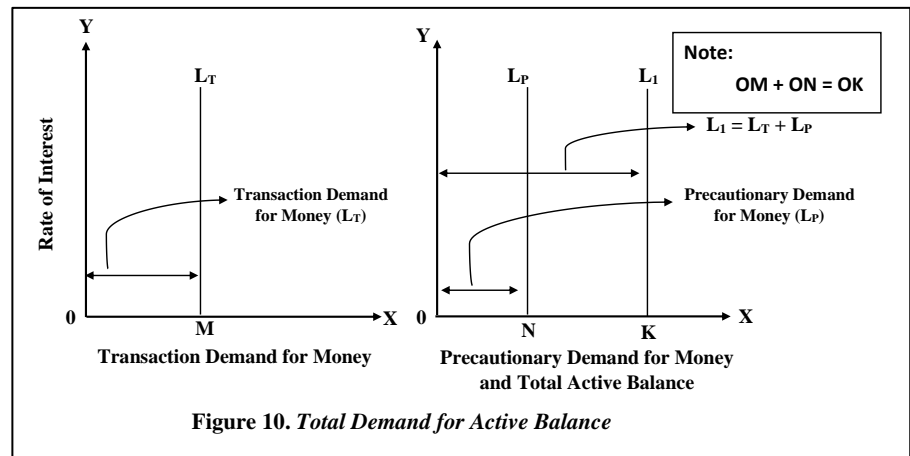
Transaction Demand for Money (L_T): Transaction demand for money means the demand for money for day-to-day transaction purposes. The need of holding cash balance arises because income is received

at a point of time or in a certain interval (say, weekly or monthly) but is spent continuously as and when necessary. Thus, transaction demand for money comes from individuals or business firms to meet their regular expenditures. So, when people demand to keep cash balances in hand for making transactions on regular basis (day to day transactions), it is known as the transaction demand of money.

The *transaction demand for money* is positively related with the level of income. In other words, with the increase in the level of income (Y), people start spending more and thus, the transaction demand for money goes up. More simply, When the level of income increases people tend to buy more goods and services for which they need more cash in hand which, in turn, reflects the transaction demand for money. The transaction demand for money is an increasing function of the level of income (keeping the price level constant); also, a worth noting point is that the transaction demand for money is independent of the rate of interest. It can be denoted as:

$$L_T = f(Y)$$

Precautionary Demand for Money (L_P): Keynes argued that both individuals and business firms keep some amount of cash in hand in excess of their transaction demand to meet any expenditure due to any unforeseen events like theft, loss due to fire, loss of job, accident, etc. besides, unforeseen opportunities such as sudden fall in prices of goods and services, sudden fall in the price of bonds etc. For these purposes, according to Keynes, people hold ideal cash balances in hand



which is also independent of the interest rate. The *precautionary demand for money* is also an increasing function of the level of income (Y). With the increase in the level of income, people and business firms tend to hold more cash in hand as precautionary purpose. Thus, it can be denoted as:

$$L_P = f(Y)$$

As both transaction demand for money and precautionary demand for money are the increasing function of level of income (Y) and independent of the rate of interest (R), we can club these two functions together and will denote it as L_1 . L_1 known as demand for active balances. Symbolically, it can be written as,

$$L_1 = L_T + L_P = f(Y)$$

Figure 10 shows the Transaction demand for money and Precautionary demand for money curves. Here, L_1 curve represents the lateral summation of L_T and L_P curves which is showing the total demand for

active balance.

Speculative Demand for Money (L_2): According to Keynes, apart from keeping cash balance for transaction and precautionary purposes, people want to keep cash to make speculative gain from future opportunities. He termed this as ideal balances or speculative demand for money. Speculative demand for money is interest elastic and is inversely related with the rate of interest. It is the amount of cash which people desire to hold to make speculative gains from the purchase and sale of securities through future changes in the rate of interest. Demand for speculative demand for money is linked with the rate of interest and the price of bonds (securities). If the rate of interest rises, the market price of bonds declines.

One important question is that, how does an investor decide whether to hold his assets in the form of case or bond? For this, they compare the market rate of interest with their expected rate of interest. If the market rate of interest is higher than the expected rate of interest then the investor expects the market rate of interest to fall and also expects the bond price to rise. In such situation, the investor will hold the wealth in the form of bonds for future capital gain. Thus, the demand for speculative demand for money will decline at a high rate of interest. Similarly, If the market rate of interest is lesser than the expected rate of interest then the investor expects the market rate of interest to rise and also expects the bond price to fall. In such situation, the investor will not hold the bonds to avoid capital loss.

Thus, the demand for speculative demand for money will increase at a low rate of interest. Thus, the speculative demand for money is a decreasing function of rate of interest which can symbolically be written as:

$$L_2 = f(R)$$

In Figure 11, L_2 is the speculative demand for money curve which slopes downward from left to right. It reflects that with the increase in the rate of interest the speculative demand for money falls and vice versa. However, at a very low rate of interest, say R , the speculative demand for money becomes infinitely elastic. Because, at a very low rate of interest (critical minimum level of market rate of interest), holding bonds become very risky and thus, people become ready to keep cash in hand instead of bonds. This situation is known as '**Liquidity Trap**'. In this situation, Keynes stated that, the Monetary policy becomes ineffective. In other words, the increase in money supply will not be effective in reducing the market rate of interest.

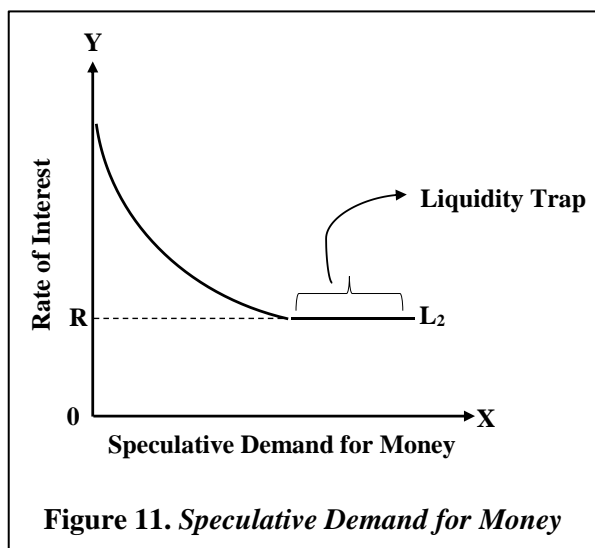


Figure 11. Speculative Demand for Money

Total Demand for Money (M_D): Total demand for money is the sum of transaction demand for money, precautionary demand for money and speculative demand for money. It can be expressed as:

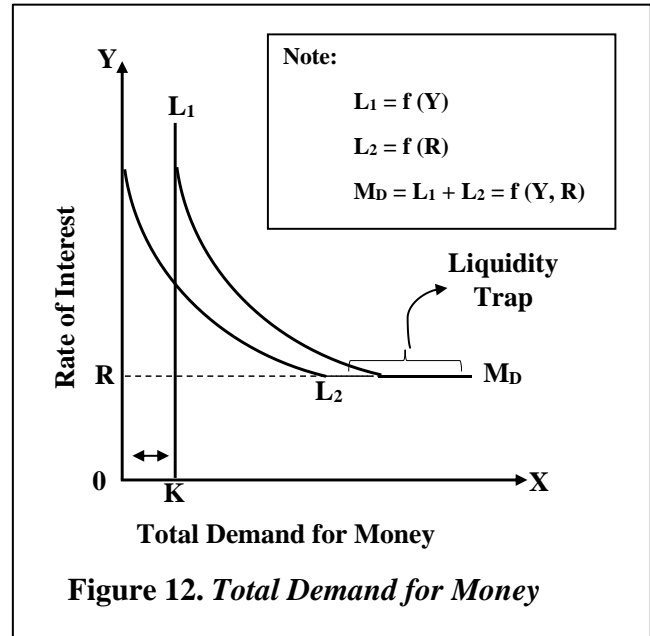
$$M_D = (L_T + L_P) + L_2$$

$$M_D = L_1 + L_2$$

$$M_D = f(Y) + f(R)$$

$$M_D = f(Y, R)$$

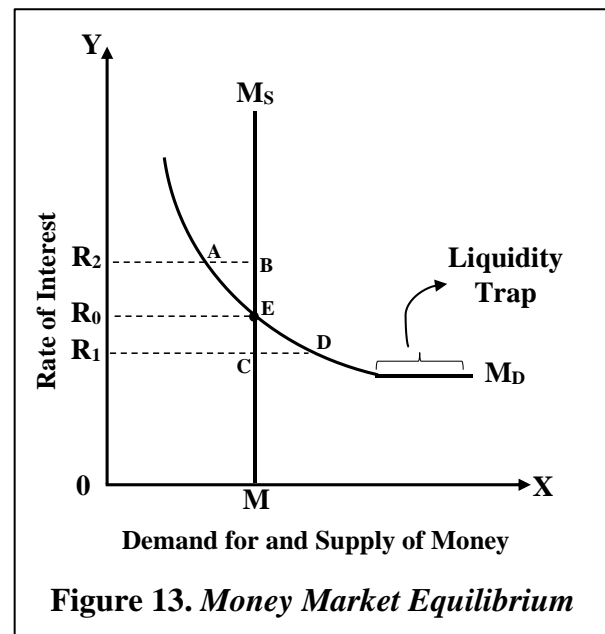
Thus, the total demand for money (M_D) depends on the rate of interest (R) and the level of income (Y). The demand for money is a positive function of the level of income and a negative function of the rate of interest. The demand for money curve (M_D) is derived by superimposing the L_1 and L_2 curves. It is presented in the Figure 12.



Determination of Equilibrium Rate of Interest:

In the Figure 13, the process of determination of equilibrium rate of interest is depicted. On Vertical axis, the rate of interest is measured and on horizontal axis, the demand for and supply of money is measured.

The equilibrium rate of interest is determined at a level where the demand for money is equal to the supply of money. As stated already, the supply of money curve is independent of rate of interest and exogenously determined by the monetary authority of the nation. Thus, it is inelastic (constant at OM level) and parallel to OY axis. In the diagram, it is seen that the equilibrium is reached at point E where the demand for money curve (M_D) intersects the supply of money curve (M_S) ($M_D = M_S$). At the equilibrium point E , the rate of interest determined is R_0 . Any other rate of interest is unstable. Suppose, the rate of interest increases from R_0 to R_2 , which will cause the demand for money (M_D) to fall short of the supply of money (M_S) by AB amount. It means that the amount of money people demands to hold is less than what is supplied by the monetary authority. Thus, people prefer to buy bonds, this buying of bonds will raise the price of bonds and thus, the rate of interest will fall (since, there is a negative relationship between bond price and rate of interest). This process will continue till the rate of interest reaches its equilibrium level of R_0 .



Similarly, when the rate of interest falls to R_1 , below the equilibrium level R_0 , the speculative demand for money will increase because at a lower rate of interest the preference for cash holding increases. As a result, the Supply of Money (M_S) falls short of the Demand for Money (M_D) by CD amount. Since, there is shortage of money in the money market, people begin to expect a rise in the interest rate and, therefore, demand for money begins to decrease and continues to decrease until the equilibrium rate of interest R_0 is restored. Thus, it can be said that this equilibrium rate of interest of R_0 is supposed to be stable.

Criticism of the Keynesian Theory of Demand for Money:

The Keynesian theory of demand for money was undoubtedly a radical improvement over the classical and neoclassical theories of money. His theory has however been criticized on the following grounds.

- a. Keynes' division of demand for money between transaction, precautionary and speculative motives is unrealistic. For, the people do not maintain a separate purse for each motive. They have one purse for all purposes. Besides, empirical evidence shows that, contrary to Keynes' postulate, even the transaction demand for money is interest-elastic.
- b. Critics reject the Keynesian postulate that there exists a 'normal' rate of interest and the current rate of interest may not necessarily be the same as the normal rate: there may always be a difference between the two. According to Keynes, the speculative demand for money is governed by the difference between the 'normal' and the current rates of interest. But the critics argue that if the current rate of interest remains stable over a long period of time, people tend to take it to be the normal rate. Consequently, the difference between the current rate and the normal rate disappears. With it, disappears the basis for speculation and the speculative demand for money.
- c. Keynes assumed unrealistically that the people hold their financial assets in the form of either idle cash balance or bonds. In fact, people hold their assets in a combination of both the assets.

1.8 Theory of Multiplier

The concept of multiplier was first developed by F. A. Kahn in early 1930s. Later Keynes modified this concept. Kahn developed the concept of multiplier with reference to increase in employment as a result of increase in the level of investment. On the other hand, Keynes modified the concept by introducing increase in the level of income as an increase in the level of investment. Thus, Kahn's theory is known as *Employment Multiplier* and Keynes theory of multiplier is known as *income or output multiplier*. In this part we will be discussing the Keynesian theory of income multiplier.

The multiplier is the ratio of change in income to the change in the level of investment. In other words, the increase in output (or income) in the economy is a multiple of the increase in private investment (or government expenditure). If the size of the multiplier is greater than 1, then a \$ 1 increase in spending

will increase the total output by a value greater than \$1. We can express it as $K = \frac{\Delta Y}{\Delta I}$, where, ΔY is the change in income (or output), ΔI is change in investment spending and K is the size of multiplier. Using this notation, we can obtain the value of multiplier only after known the change in income as a result of change in investment. But what if we are concerned about knowing by what amount the income level will increase as a result of increase in the investment by a certain amount. In such case, we can find the value of Multiplier (K) using the value of Marginal Propensity to Consume (MPC) (ratio of change in the level of consumption to a change in the level of income) as $K = \frac{1}{1-MPC}$.

Diagrammatic Representation of the Multiplier process:

We already have discussed that an economy attains its equilibrium at a where the planned expenditure (Y) and aggregate expenditure ($C+I$) are equal. The process of multiplier is depicted in Figure 14.

In Figure 14, the OX axis measures the National Income or output and OY measures the Aggregate expenditure and Planned Expenditure. The ‘ C ’ curve indicates the consumption function, and we are assuming the MPC is 0.5. The equilibrium will be determined at a point where the $AE=PE$.

In the diagram, the initial equilibrium is reached at E where the $AE_1 (=C+I_1)$ is equal to PE . At this point, the equilibrium level of output is determined to be OM . Now suppose, the investment is increased from I_1 to I_2 . This, will lead to a shift in the aggregate expenditure curve from AE_1 to AE_2 which in turn cause the equilibrium point to shift from E to E_1 . As a result of this increase in the level of investment, the equilibrium level of income will increase from M to N . We can trace the amount of change in the level of investment which is equal to RE_1 .

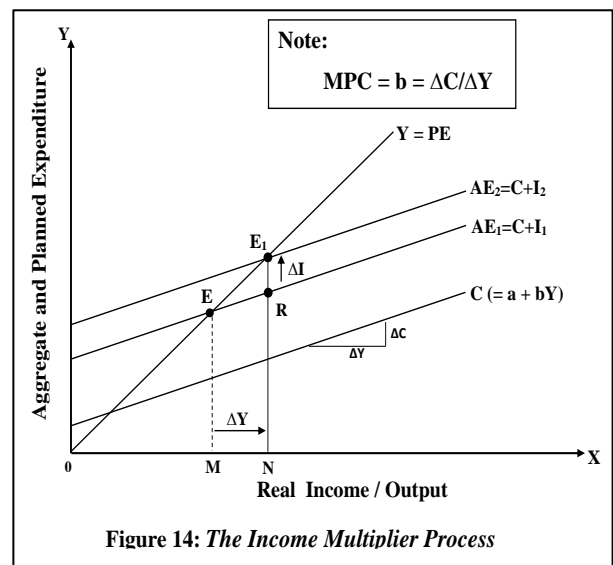


Figure 14: The Income Multiplier Process

Given the value of $MPC=0.5$, the value of the multiplier (K) will be equal to 2. Thus, it is expected that the increase in income will be twice that of the increase in the level of investment. In other words, we can say that, the increase in the level of income ($\Delta Y=MN$) is twice that of the increase in the level of investment ($\Delta I=RE_1$).

Algebraic Derivation of the Multiplier:

Let the initial equilibrium situation be:

$$Y_1 = C + I_1$$

$$Y_1 = a + bY_1 + I_1 \dots\dots\dots (1)$$

Now, suppose the level of investment has increased from I_1 to I_2 , which will increase the level of income from Y_1 to Y_2 . So, the new equilibrium situation will be:

$$Y_2 = C + I_2$$

$$Y_2 = a + bY_2 + I_2 \dots\dots\dots (2)$$

Now, subtracting equation 1 from equation 2 we will get:

$$Y_2 - Y_1 = (a + bY_2 + I_2) - (a + bY_1 + I_1)$$

$$\Delta Y = a + bY_2 + I_2 - a - bY_1 - I_1$$

$$\Delta Y = bY_2 + I_2 - bY_1 - I_1$$

$$\Delta Y = b(Y_2 - Y_1) + (I_2 - I_1)$$

$$\Delta Y = b \Delta Y + \Delta I$$

$$\Delta Y - b \Delta Y = \Delta I$$

$$(1 - b) \Delta Y = \Delta I$$

$$\frac{\Delta Y}{\Delta I} = \frac{1}{1 - b} (= K)$$

So, the size of the Multiplier (K) is equal to $\frac{\Delta Y}{\Delta I}$ or $\frac{1}{1-b}$ where b = MPC.

Thus, when investment expenditure increases (ΔI), the real income (Y) of the economy increases but the increase in real income (ΔY) of the economy is much higher than that of the increase in the investment expenditure (given that MPC > 0). So, as a result of change in investment expenditure, the final change in income can be represented as:

$$\Delta Y = \frac{1}{1 - b} \times \Delta I = K \times \Delta I$$

[NOTE: Greater the value of MPC (=b), larger will be the size of multiplier (K)]

Leakages of Multiplier:

Leakages are the potential diversions from the income stream which tend to weaken the multiplier effect of new investment. Given the marginal propensity to consume, the increase in income in each round declines due to leakages in the income stream and ultimately the process of income propagation "peters out". The following are the important leakages:

- a. **Saving:** Saving is the most important leakage of the multiplier process. Since the marginal propensity to consume is less than one the whole increment in income is not spent on consumption: A part of it is saved which comes out of the income stream. Thus, the higher the marginal propensity to save (or lower marginal propensity to consumer), the smaller the size of the multiplier and the greater the amount of leakage out of the income stream, and vice versa.
- b. **Purchase of Old Stocks and Securities:** If a part of the increased income is used in buying old stocks and securities instead of consumer goods, the consumption expenditure will fall and its

cumulative effect on income will be less than before. In other words, the size of the multiplier will fall with a fall in consumption expenditure when people buy old stocks and shares.

- c. **Price Inflation:** When increased investment leads to price inflation, the multiplier effect of increased income may be dissipated on higher prices. A rise in the prices of consumption goods implies increased expenditure on them. As a result, increased income is absorbed by higher prices and the real consumption and income fall. Thus, price inflation is an important leakage which tends to dissipate increase in income and consumption on higher prices rather than in increasing output and employment.
- d. **Net Imports:** If increased income is spent on the purchase of imported goods it acts as a leakage out of the domestic income stream. Such expenditure fails to affect the consumption of domestic goods. This argument can be extended to net imports when there is an excess of imports over exports thereby causing a net outflow of funds to other countries.
- e. **Undistributed Profits:** If profits accruing to joint stock companies are not distributed to the shareholders in the form of dividend but are kept in the reserve fund, it is a leakage from the income stream. Undistributed profits with the companies tend to reduce the income and hence further expenditure on consumption goods thereby weakening the multiplier process.
- f. **Taxation:** Taxation policy is also an important factor in weakening the multiplier process. Progressive taxes have the effect of lowering the disposable income of the taxpayers and reducing their consumption expenditure. Similarly, commodity taxation tends to raise the prices of goods, and a part of increased income may be dissipated on higher prices. Thus, increased taxation reduces the income stream and lowers the size of the multiplier.

Let us sum up

At the beginning we have critically discussed about the classical theory of employment and output. After this, we have moved to the discussion of Keynesian theory of employment output and income. Further we have discussed the consumption function, theory of multiplier.

Keywords

Classical School

Keynesian Macroeconomics

Consumption function

Theory of Multiplier

Short answer type questions

1. Write a short note on the Say's law of market.
2. Mention the assumptions of Classical Theory of employment.
3. Mention the propositions of Classical Theory of employment.
4. Write a short note on theory of multiplier.
5. Write a short note on the policy implication of Keynes theory of Income and employment.

Long answer type questions

1. Explain the process of determination of real wage rate under classical system.
2. Discuss how Keynes criticized the classical theory of employment.
3. Explain the process of determination of equilibrium income and output under Keynesian system.
4. Explain the Keynes theory of consumption.
5. Critically discuss the Keynes theory of interest.

Suggested reading

Ahuja, H. L., Macroeconomics- Theory and Policy, S. Chand & Company Ltd, New Delhi.

Mankew, N. G., Macroeconomics. 9th Edition, Worth Publishers, New York.

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UNIT II: Neo-Classical and Keynesian Synthesis

Structure

- 2.1 Introduction
- 2.2 Objectives
- 2.3 Classical Theory of Interest
- 2.4 Keynesian theory of interest
- 2.5 IS-LM model
- 2.6 Relative effectiveness of fiscal and monetary policy
- 2.7 Extension of IS-LM Model to Labour Market and Flexible Price
- 2.8 Mundel Fleming Model

2.1 Introduction

It is important to understand the process of determination of equilibrium level of income in the economy and factors influencing the level of income, role of monetary and fiscal policies in an economy. Hence, this module discusses about the classical and Keynesian theory of interest, IS-LM model, relative effectiveness of monetary and fiscal policies, extension of IS-LM model to an open economy and Mundell-Fleming model.

2.2 Objectives

The objective of this module is to impart the learners about the concept of IS curve, LM curve and IS-LM model in determination of general equilibrium. It also aims to provide knowledge to the learners about the relative effectiveness of monetary and fiscal policies and open economy model.

2.3 Classical Theory of Interest

The classical theory of interest states that interest is a real phenomenon and the rate of interest is determined exclusively by the real factors which is the supply of and demand for capital. The supply of capital is governed by thrift i.e. saving or time preference while the demand for capital is influenced by the productivity of capital. And the framework within which these forces act or counteract is under perfect competition.

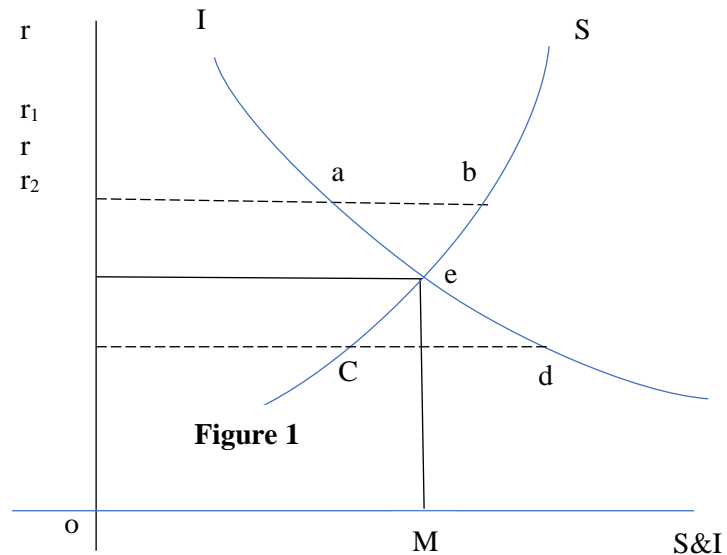
The supply of capital depends upon savings which, in turn, depend upon a number of psychological, economic and institutional factors broadly classified as – (a) the will to save, (b) the power to save, and (c) the facilities to save. Saving means curtailment of consumption or postponement of the present consumption. Thus, saving involves a sacrifice, abstinence or waiting. The rate of interest is considered to be the reward for abstinence or waiting.

It is an inducement for the act of saving or foregoing the present consumption. In deciding between the present

consumption (which involves no saving) and the future consumption (which requires saving), the individual has to take into consideration the opportunity cost of each alternative and the opportunity cost is measured by the rate of interest.

For example, if the rate of interest per year is 5 percent, then by consuming Re. 1 of out of current income, the individual is foregoing the consumption of Rs. 1.05 a year later. Thus, the higher the current rate of interest, the greater the opportunity cost of present consumption compared to the future consumption. As a result, greater the inducement will be to save out of the present income.

Hence, there exists positive relationship between the rate of interest and saving. The supply curve of capital or the saving schedule therefore slopes upward to the right indicating a positive relationship i.e. higher the rate of interest, larger will be the savings and greater will be the supply of capital and vice versa (Figure 1).



r is the equilibrium rate of interest. At r_1 supply of capital is in excess to the tune of 'ab' as such the rate of interest will fall until the equilibrium is restored at r . On the other hand, at r_2 the demand for capital is in excess of supply to the tune of 'cd'. Hence, the rate of interest will rise until the original equilibrium is restored at ' r ' where I intersect the s curve at e .

Symbolically, the savings as function of rate of interest with positive relation can be written as

$$S = f(i)$$

$$dS/di > 0$$

Capital is demanded by the investors for productive usage that brings profits to them. The demand for capital or investment demand depends on the productivity of capital, i.e. returns on investment as well as on the rate of interest, i. e., the cost of investment.

Productivity of capital is subject to the law of diminishing returns. As such, additional units of capital becomes less productive than the earlier units. The producer will continue to make investment of capital as long as the productivity of capital is more than the rate of interest. Investment will stop when the productivity of capital equals the rate of interest. This shows that at higher rates of interest, demand for capital is less and vice-versa. Thus, the demand for capital is inversely related to the rate of interest and for that matter the demand curve for capital slopes downward to the right (Figure 1).

Symbolically, the investment as function of rate of interest with inverse relation can be written as

$$I = f(i)$$

$$dI/di < 0$$

Determination of equilibrium rate of interest takes place when there is intersection of the demand and supply curves. At that point of intersection, the absolute value of the slopes of demand for capital and supply of capital are identical. Symbolically the equilibrium rate of interest (i^*) can be written as

$$i^* = dS/di = dI/di$$

and at this point $I = S$ implying the equality of investment demand and supply of capital. The equilibrating factor here is the flexible interest rate and it maintains the stability of the equilibrium. Any deviation from the equilibrium rate of interest will be, therefore, automatically corrected. In case of investment demand exceeding supply of capital i.e. $I > S$, then the rate of interest will slide upward to revert back to original equilibrium. On the other hand, if the investment demand is less than supply of capital i.e. $I < S$ then the rate of interest will glide downward towards the original equilibrium.

2.4 Keynesian theory of interest

Unlike the classical theory, Keynes considers the forces determining interest as monetary phenomenon rather than real. Thus, the preference to hold liquidity is truncated into three motives of holding it, namely, the Transaction demand (T_d), Precautionary demand (P_d) and Speculative demand (S_d).

Transaction demand (T_d):

While income is generated over a span of time, it is paid at a particular point in time, say, weekly, bi-monthly, monthly and so on. However, in day to day life a number of transactions are required by the individual income earners. Thus, there exist a time lag between the current receipt and forthcoming or future receipt, which individual has to smoothly bridge over. Hence, there arises the necessity of holding money for transaction motive.

The transaction demand is function of income level enjoyed by the income earner. Thus, higher the income, higher is the transaction requirements and so higher will be the transaction demand for money. However, the transaction demand for money is, on the average, a constant proportion of the level of income. Symbolically,

$$T_d = t(y)$$

Such that $t' > 0$ but is a constant proportion

Where y is income

Precautionary demand (P_d):

Income earners often try to fend themselves from the plausibility of unforeseen contingencies. Hence, there arises the need to secure some part of the income for precautionary purposes and this give rise to the precautionary motive to hold money. Also, higher the income, larger will be the proportion of money holding for precautionary purposes. Akin to the transaction demand, precautionary demand too is but a constant proportion of the level of income earned. Symbolically

$$P_d = p(y)$$

Such that $p' > 0$ but is a constant proportion

Where y is the income

Speculative demand (S_d):

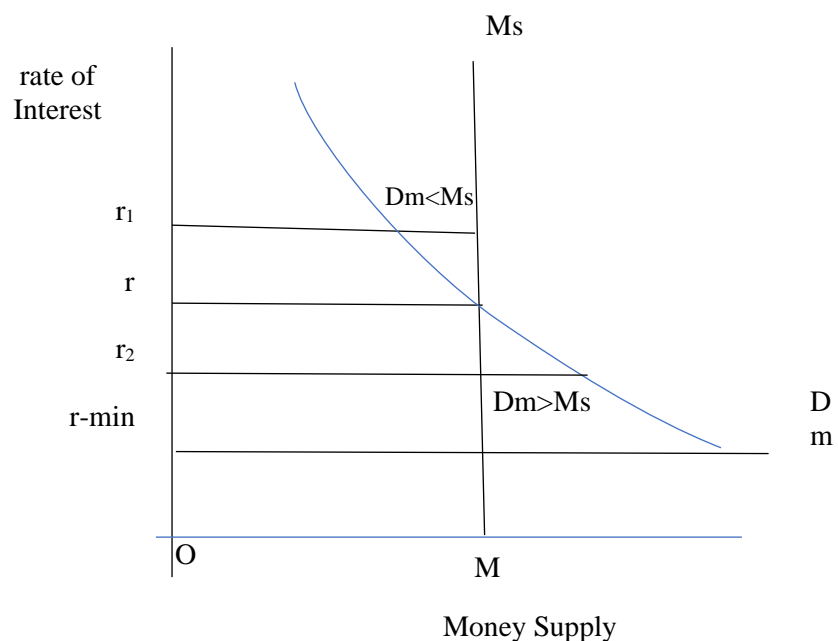
Other than the transaction and precautionary motives, income earners also have the motives to earn return upon income earned. As such, they try to speculate upon such opportunities so as to earn returns out of their incomes. This gives rise to the speculative motive to hold money, usually by buying or selling bonds. Thus, if income earners expect bond price to rise, concomitantly, the interest rates to fall; they buy bonds rather than holding the money. Conversely, if the expectation is of falling bond price, thereby a hike of rate of interest, income earners will hold the money to earn interest rather than buying bonds. Hence, speculative demand for money is inversely related to the rate of interest, given in figure as D_M . Symbolically,

$$S_d = s(i)$$

Such that $s' < 0$ i.e. related inversely with rate of interest

Where, i , is the rate of interest

FIGURE 2



Since the transaction and precautionary demand for money are related positively to income level of the earners as well as are a constant proportion of the income earned, it does not have any bearing upon the rate of interest. It is only the speculative demand for money that has definite bearing due to rate of interest and in an inverse way. Thus, the liquidity preference, particularly speculative demand for money, has a negative slope (Figure 2).

On the supply front, money supply (M_s) is given for a period of time. Usually, it is exogenously determined by the monetary authority and is, therefore, a vertical function rather unlike the classical supply function of capital.

The determination of equilibrium rate of interest occurs at the point of intersection between the vertical money supply curve and the negatively sloped speculative demand for money at r . The negatively slope curve becomes perfectly elastic at a low rate of interest because of the floor interest rate below which the rate of interest cannot fall further. This minimum rate of interest indicates absolute liquidity preference of the people and is called liquidity trap.

Suppose that the rate of interest is greater than the equilibrium rate, say, at r_1 . In such situation, as supply of money exceeds the demand. As such income earners will purchase more bonds rather than holding the money. The bond price will rise leading to a fall in interest rates up to the point where demand for money becomes equal to the supply of money. Contrarily, if the rate of interest is less than the equilibrium interest rate at r_2 , the supply of money is less than the demand for it. Income earners tend to sell their bonds leading to a fall in bond price and a hike in interest rates.

In Keynesian theory D_M and S_M determine the equilibrium rate of interest. However, without knowing the level of income we cannot know amount of money demanded. Any change in the level of income will call forth in the liquidity preference schedule, thereby, leading to a change in the interest rate. One cannot, therefore, determine the rate of interest unless the level of income is known and the level of income cannot be determined until the rate of interest is known. Hence the formulation is indeterminate. Hicks and Hansen solved this problem in their IS-LM analysis by determining simultaneously the rate of interest and the level of income which we will be dealing in the subsequently.

2.5 IS-LM model (Hicks-Hansen Synthesis of Classical and Keynesian Formulations)

In deciding whether to invest in a given project, firms generally undertake the Present Discounted Value (PDV) of future income from the investments. In other words, the firms weigh the future income streams by discounting it by rate of interest. As such, firms rank various projects in order of the PDV. With an elastic supply of investment funds, firms will invest in those projects where $PDV > 0$ while with only limited investment funds the firm will invest in those projects where the PDV is highest until it runs out of fund (somewhere to the left of i in figure 3). The formula for PDV is given as

$$PDV_t = -C + R_t + R_{t+1}/1+r + R_{t+2}/(1+r)^2 + \dots + R_{t+n}/(1+r)^n \quad 1$$

Where, PDV_t is the Present Discounted Value of future income stream at point of time t , R_t is the return in time period t , R_{t+1} the return in the period subsequent to t , and so forth. R is the discounting factor or the rate of interest.

As such, as the denominator representing rate of interest is high relative to the numerator (representing returns), the subsequent sequel of returns get smaller and smaller and vice-versa.

Thus, the simplest investment model can be written as

$$i = i(r) \quad 2$$

such that $i' < 0$ stating an inverse relationship between interest rate and investment

In the figure 4, it is therefore, clear that as interest rates are high the investment demand are low and vice versa. As

such the commodity market equilibrium can be written as

$$y = c + g + i(r)$$

3

Where y is the national output or income, c is the consumption representing the household sector, g the government expenditures and $i(r)$ the investment function. Further, the consumption function can be written as function of disposable income or for that matter income exclusive of tax, where tax itself is functionally related to income levels.

$$c = c(y - t(y))$$

4

Hence, the goods market equation becomes

$$y = c(y - t(y)) + g + i(r)$$

5

Now the equation 5 represents a pair of r and y which will maintain the equilibrium in the commodity or goods markets (Figure 5). As we already know that an increase in rate of interest r may cause the investment i to go down (Figure 3), the figure 4 captures this dynamics. Here $s+t$ is the saving plus taxation function and is the source of supply of capital. The demand for investment or planned expenditure comes from investors including the government expenditures. Initially at $i(r_0) + g$ the level of income determined is at y_0 . As the rate of interest increases, the investment demand falls (figure3) and this leads to drop down in the total output to y_1 . Thus, for every level of output we have a particular level of rate of interest.

As the total output from demand side is given as $y=c+i+g$ and from supply side as $y=c+s+t$; at equilibrium

$$c+i+g = y = c+s+g$$

or

$$c+i+g = s+t+g$$

Considering government expenditure g as exogenously determined and cancelling the common term i.e. c which occurs at both LHS and RHS (Left Hand Side and Right Hand Side respectively), and being endogenous to the model, we get;

$$i+g = s+g$$

The same is depicted in figure 5

FIGURE 3

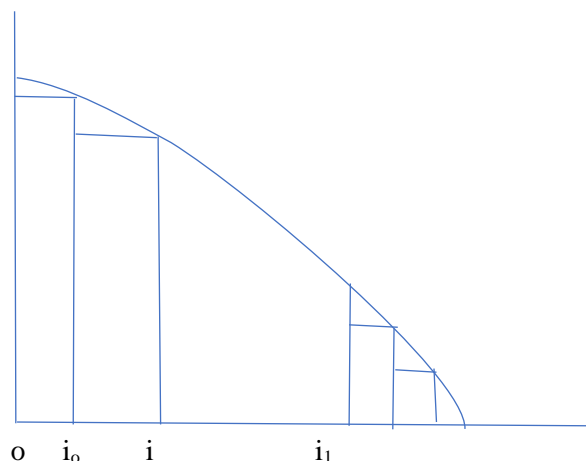
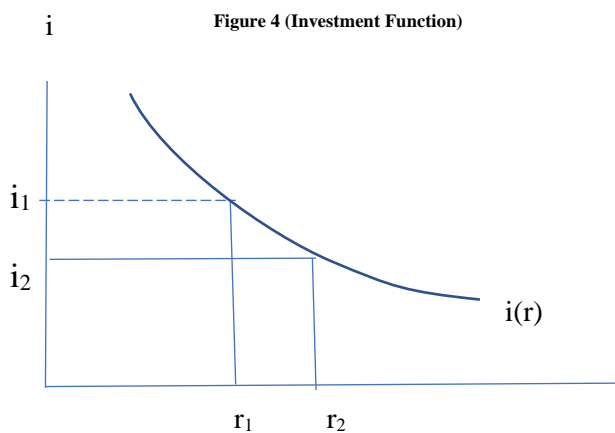


Figure 4 (Investment Function)

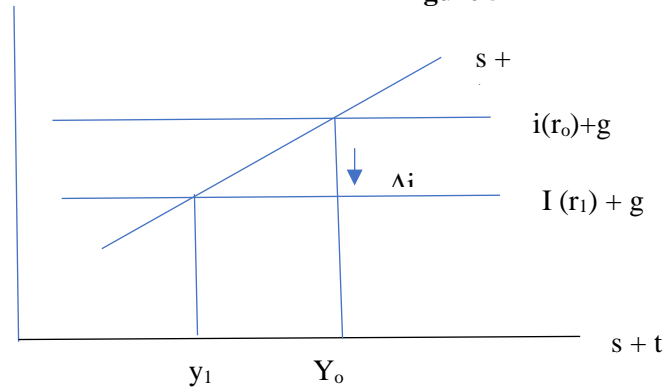


As can be at high rate of interest the PDVs are relatively low compared to low rate of interest where PDVs are relatively high – compare i_0 &

i_1 . As r_1 is low compared to r_2 the level of investment demand is higher at i_1 while the investment demand drops down to i_2 at higher interest rate r_2

Saving
&
Investment

Figure 5



$$c + i + g = y = c + s + t$$

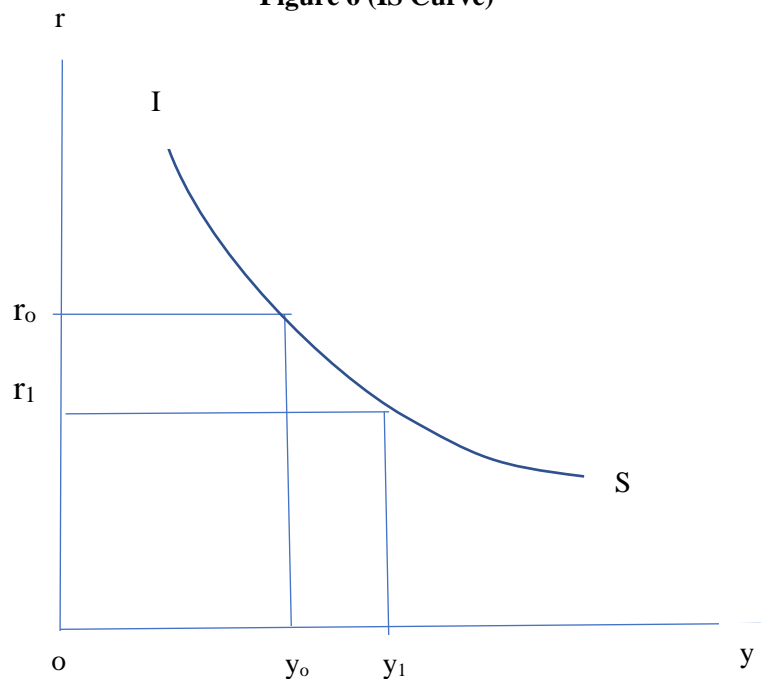
or by cancelling c from both left and right hand side of the equation we get

$$i + g = y = s + t$$

Thus, for the above pairs of r and y consistent with each other can be plotted as IS curve (Figure 6) as below.

At r_0 the level of output in commodity market is y_0 and at lower level of interest at r_1 the level of output consistent at y_1 . Thus, the IS curve has a negative slope.

Figure 6 (IS Curve)



So far, we have derived the IS curve representing infinite pair of r and y values, independent of the money market. The next step is to derive the equilibrium in the money market independent of the commodity market. We begin by defining money as currency in circulation plus demand deposit. Both kinds of money shares the features of being accepted as unit of exchange only i.e. earning no interest. It is, therefore, the bonds alone that earns interest. Thus, liquid assets are categorised into two – money and bonds – an individual can choose one over other.

The money market too is governed by the principles of demand for and supply of it. We deal with the demand side first. Since individuals can choose to put the liquid assets into either bond or money, any increase in interest rate or the rate of return on bonds, more of the assets will be put into bonds and less on money. Conversely, if the rate of return or interest on bond decreases he will be more tempted to keep his assets as money thereby selling off bonds.

The money market too is governed by the principles of demand for and supply of it. We deal with the demand side first. Since individuals can choose to put the liquid assets into either bond or money, any increase in interest rate or the rate of return on bonds, more of the assets will be put into bonds and less on money. Conversely, if the rate of return or interest on bond decreases he will be more tempted to keep his assets as money thereby selling off bonds.

The functional relation to hold more or less money depending upon interest rates is called the speculative demand for money which can be symbolically be put as

$$S_d = l(r)$$

Such that $l' < 0$, implying inverse relation between bond price and interest rates/rate of return (remember bond price is inversely related to interest rates). Also, l here refers to liquidity preferences.

Another reason for demanding real balance is the transaction demand for money which is a constant proportion (k) of the level of income (y) and is related positively.

$$T_d = k(y)$$

$$k' > 0$$

Both speculative and transaction demand for money constitutes the demand for real balances i.e. $M/P = m$, where M is the money supply, P the price level and therefore m is the demand for real balance. As such,

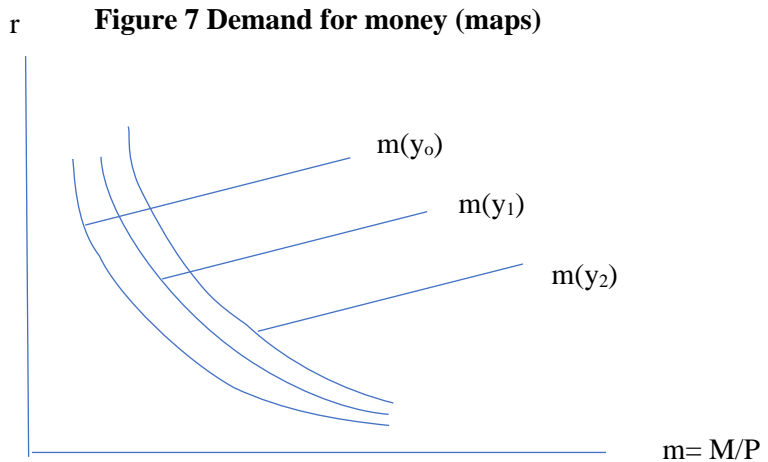
$$M/P = m = l(r) + k(y)$$

In general, both speculative and transaction demand for money cannot be separated. In other words, an increased preference for bond would reduce the available real balance of the individual and therefore available resources required to maintain the transaction demand. It is for the reason that the opportunity cost of holding money increases when the expected return on bonds are high. The demand for real balance may be, therefore, written more generally as

$$M/P = m = m(r, y)$$

Such that $(dm/dr) < 0$ and $(dm/dy) > 0$, despite being not separated. The relevant graphic illustration is given in figure 7.

Figure 7 shows the money demand function where the demand for real balances has been plotted against rate of interest for different income level. At any



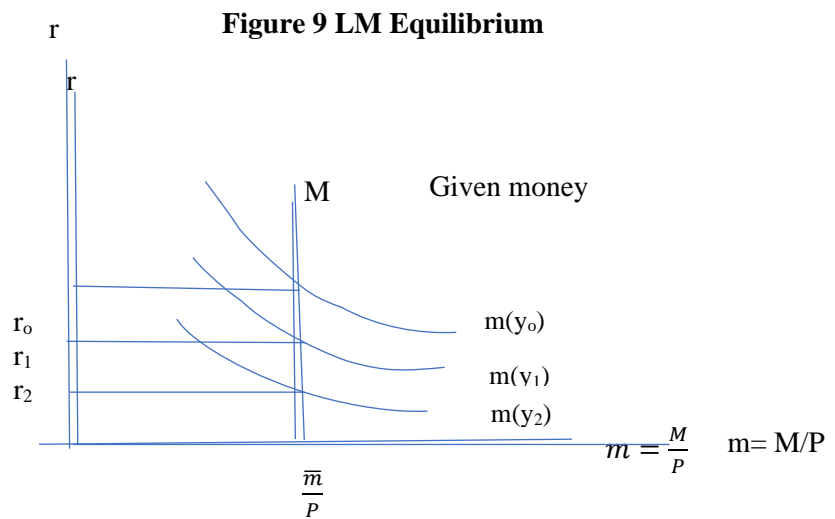
given level of income, say y_0 which also fixes the transaction demand, as r rises speculative demand falls, reducing the total demand. Also, at any given rate of interest, say r_0 , fixing speculative demand, as income rises transaction demand also increases, increasing total demand. The nature of money demand or demand for real balance curve is influenced by two factors. One, at the very high rate of

interest or returns on bonds, speculative demand for money will be squeezed to irreducible minimum. Two, as rate of interest falls lower and lower, people become increasingly indifferent towards either holding money or bond. The demand for money curve may, therefore, become very flat at low interest rates. It is for this reason that the demand for money curves in figure 7 are convergent at very high and low rates of interest. For every pair of rate of interest r and level of income y there will be one money demand function, and a collection of such demand functions make a money demand function maps.

On the supply front, the supply of real balances or money are fixed by the institutional arrangements; by the

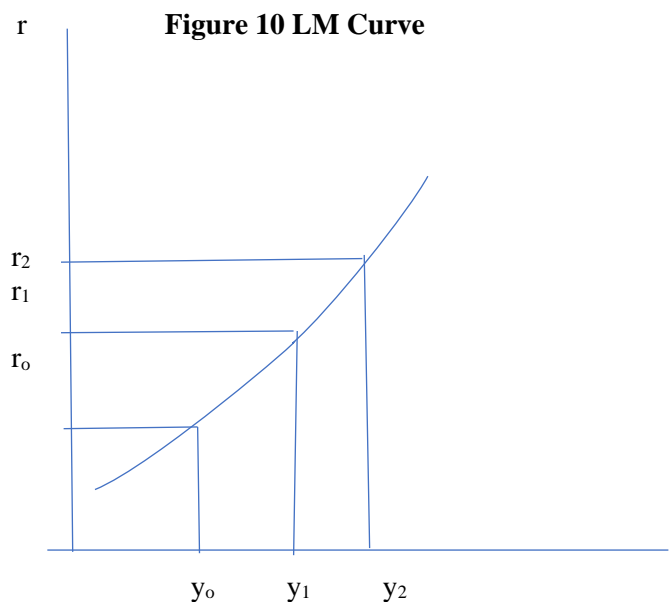
network of commercial banking system and the central bank. Hence, for a period of time the total money supply (M_s) is given by a vertical curve as given in Figure 8.

The equilibrium in money market is determined at the points of intersection between the money demand curves and the vertical M_s curves. Thus, for every level of output or income, there will be a money demand function for the given level of the money supply. The money demand function $m(y_0)$, for given money supply of (M_s), equilibrium rate of interest so determined will be r_0 . Likewise, for $m(y_1)$ it is r_1 and for $m(y_2)$ it is at r_2 .



As income falls from $m(y_0)$ to $m(y_1)$ to $m(y_2)$ rate of interest also falls from r_0 to r_1 to r_2 . A positive relationship is established.

It is intuitive that, for every pairs of r and y in simultaneity; higher is the rate of interest r higher the assets held in the form of bonds, thereby, lowering the demand for transaction demand (T_d). Remember, the higher the rate of expected returns or interest earnings through bonds, higher will be the liquid assets devoted to bonds and less will be available to transaction demands for money (as money does not earn interest *per se* the model and transaction demand being inseparable in the context of real demand for cash). The assets devoted to bonds, therefore, is higher when expected returns on it are high; and this occurs when when bond price are low, thereof, *vice-versa* (remember bond prices are related positively to rate of return upon it, and as money does not earn any return). This reduces the supply of money in the money market, leading to squeezing of investible funds into speculative demand, thereof, squeezing the transaction demands too. Contrarily; when expected rate of returns on bonds are low, more of real cash balances are available in supply; as income earners expects low earnings through returns on investment on bonds, thereby, becomes increasingly indifferent between holding cash balances and investing upon bonds. In other words, if

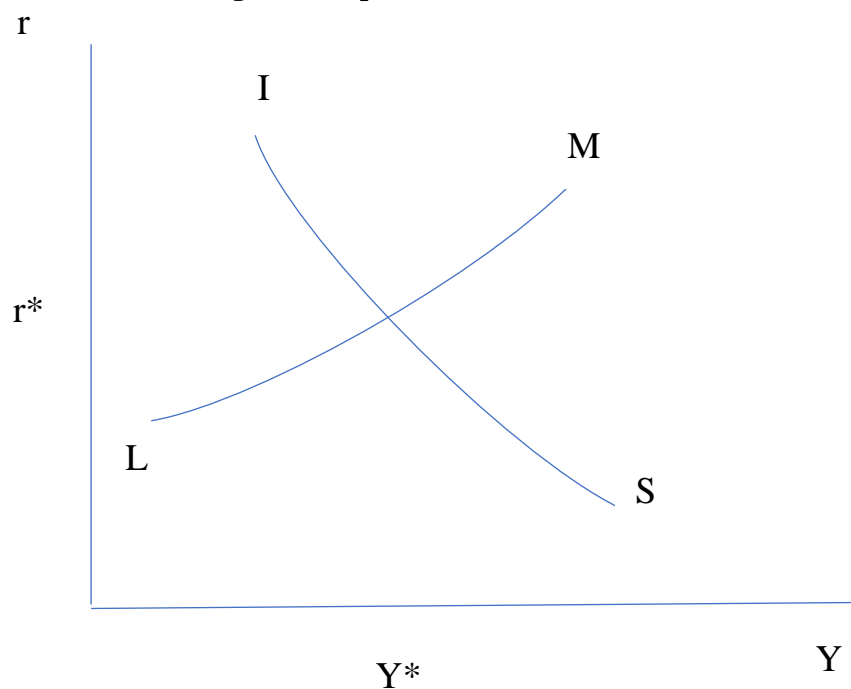


expectations are optimistic due to returns on bonds, individuals speculate, thereby, even reducing the transaction demands for money – ultimately rendering to reduced money supply. Contrary to it, when expectations are pessimistic, individuals become increasingly indifferent towards either holding real cash balances/money or bonds – rather holds money leading to increased supply of money in the market. Thus, for every given level of income, there is then the money supply function, and then a rate of interest, given the money supply. Further, the rate of interest varies inversely with the level of income i.e. lower the level of income, higher the rate of interest and *vice-versa* (understandably, at lower level of income, the economy is reflective of being in decline; expectations are low and so do the investment demands. On the other hand, the higher level of income underlines a progressive or an expanding economy; thereby, optimistic expectations and higher demand for real cash balances to be put on bonds). This positive relationship between the rate of return/interest earnings for given level of output or income is represented in Figure 10.

Positive relationship between rate of interest(r) and in curve kind is given in the figure. As income level is low, say Y_0 , the rate of return on bonds are low too.

Whereas the IS and the LM functions are determined independently, the determination of equilibrium rate of interest under the IS-LM framework is determined by the simultaneous interaction between the IS and LM functions or the curves. The equilibrium holds at the point of intersection between IS and LM curves, which are independently determined for every valued pairs of r and y , i.e. for every pair of respective r and y in the goods market (IS) as well as

Figure 11 Equilibrium under IS-LM

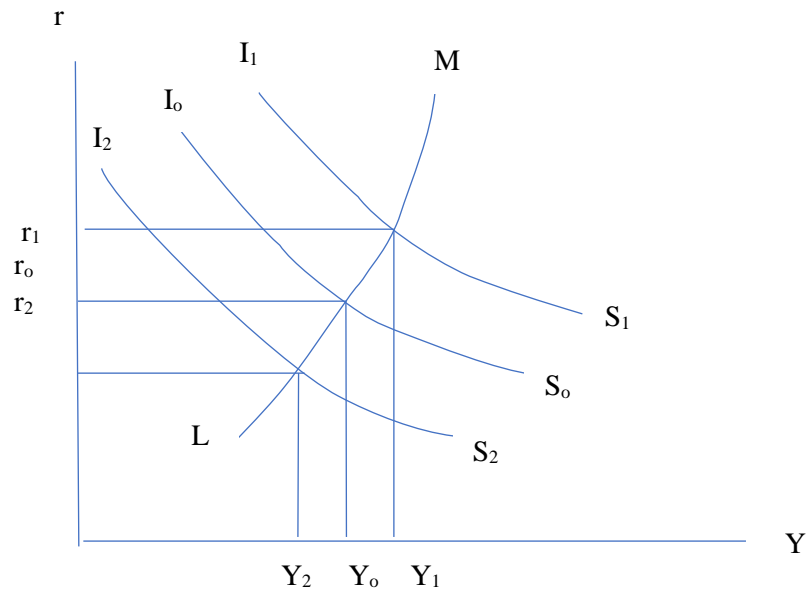


money market (LM) culminating into simultaneous equilibrium rate of interest consistent with a particular level of income (Figure 11).

The effect of shift in IS and LM curve may be due to fiscal and monetary measures undertaken in the economy. In other words, the government may increase or decrease its expenditures (g). Concomitantly, it shifts the IS curves either inward or outwards. Similarly, the money supply can be increased or decreased rendering the LM curve to either shift outward or inward.

The impact of shift in IS curve, given the LM as constant is represented in Figure 12. For the initial equilibrium for I_0S_0 and LM, the pair of equilibrium income and rate of interest are r_0 and y_0 . Now assume that there has been an increase of government expenditure (g) which may lead to shift of the IS curve towards the right of initial IS curve (I_0S_0) to say I_1S_1 . At this point, there has been an increase of output from y_0 to y_1 correspondingly the rate of interest also have increased from r_0 to r_1 . What has happened here is the forward multiplier effect of increased government expenditures and corresponding to it are the new pair of equilibrium rate of interest and income i.e. r_1 and y_1 .

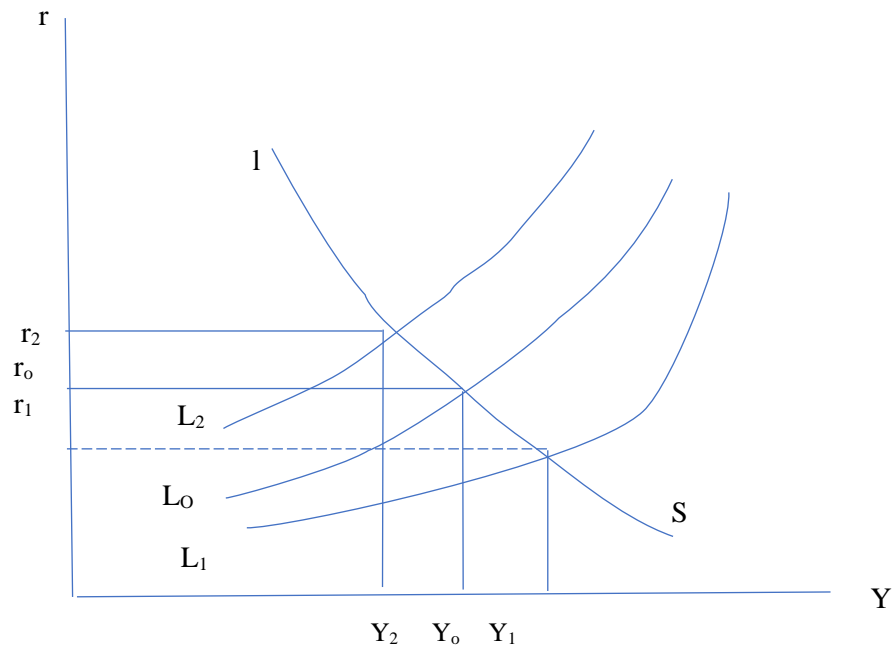
Figure 12 Shifting IS Curve



On the other hand, if government expenditures are reduced (tax rates raised), it may shift the LM curves from I_0S_0 towards left to I_2S_2 rendering the equilibrium income to drop down to y_2 and thereby the equilibrium interest rates to r_0 due to the reverse multiplier effect.

With regard to the shift in LM we keep, for the time being, the IS curve fixed as given in the figure 13. Initially the economy is at equilibrium when IS intersects L_0M_0 and the equilibrium income and rate of interest are r_0 and y_0 . Now let us assume that there has been an increase in money supply by the authority rendering the LM curve to shift outward to L_1M_1 . The increased money supply moves the economy towards higher income level at lower interest i.e. . In other words, due

Figure 13 Shifting LM Curve



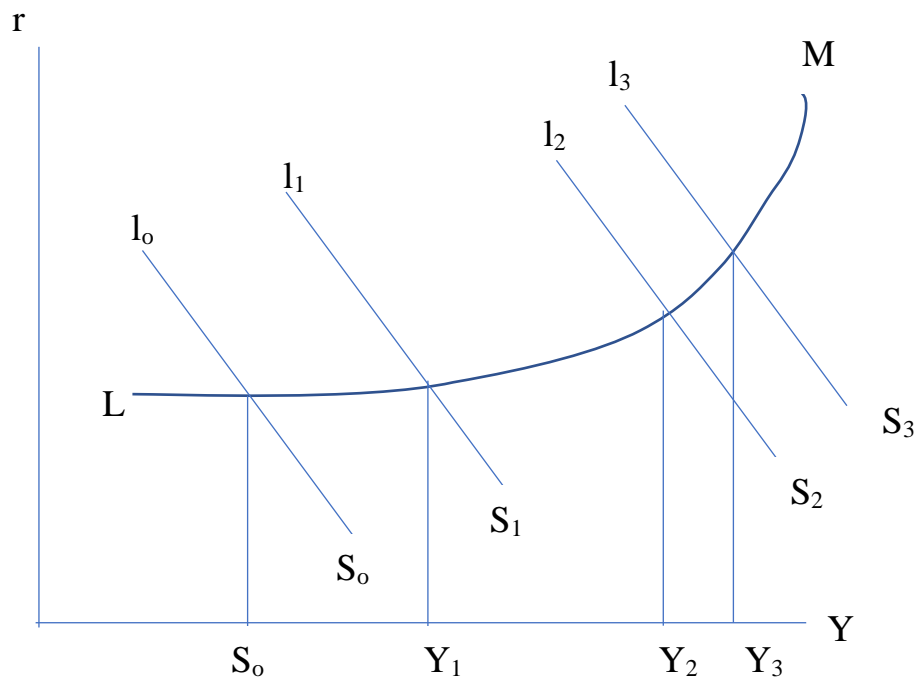
to enhanced money supply, the rate of interest declines making more of projects worthwhile for investment, thereby, increasing the investment demand. Contrarily, if there is reduced money supply, the LM curve moves leftward to L_1M_1 , thus, determining the equilibrium pair of income and interest rate at r_2 and y_2 .

2.6 Relative effectiveness of fiscal and monetary policy

The relative effectiveness of fiscal or monetary policy depends upon the relative strength of growth of the economy which is often determined by the magnitude of multiplier effect caused by either fiscal or monetary handles. First we deal with from the fiscal policy perspective and let us keep the LM function fixed (Figure 14).

In the figure, the LM curve is flat towards origin representing the minimum rate of interest below which the rate of interest cannot fall (remember r_{min} from Keynesian theory of interest). Also notice at the far end of LM curve, the curve is almost vertical implying almost complete squeezing of the investible funds due to high rate of interest (as rate of interest are high, income earners demand more real cash balances to buy bonds). Now consider the economy to be at

Figure 14 Impact of Fiscal Expansion



equilibrium where LM curve intersects the IS curve at I_0S_0 and the equilibrium rate of interest and income level determined are r_0 and y_0 . The economy is, therefore, either at low level of development or growth compared to other levels of output determined. Now assume that the IS curve shifts outwards towards right to I_1S_1 , as determined by the magnitude of multiplier and for reason whatsoever; either due to increased government expenditure (g), reduced rate of taxes (t) or private investments (i). It can be seen that the equilibrium level of income and rate of interest determined is higher at y_1 and r_1 compared to r_0 and y_0 .

Now again consider that the economy is at equilibrium as determined by given LM and I_2S_2 . At this point, the economy is at the higher plateau of growth and development. The equilibrium pair of income and rate of interest determined is y_2 and r_2 . Also, we presume the same magnitude of effect of multiplier; as in the case of shift of IS curve from I_0S_0 to I_1S_1 and I_2S_2 and I_3S_3 . In other words, the difference or gap between the two curves I_0S_0 and I_1S_1 as well as that of I_2S_2 and I_3S_3 as equal.

It can be clearly be seen that the magnitude of output growth from y_0 to y_1 in the first instance i.e. when IS curves shifts from I_0S_0 to I_1S_1 is relatively more compared to that of I_2S_2 and I_3S_3 , where the output has grown from y_2 to y_3 . Also note that the rise in the rate of interest from r_0 to r_1 is relatively less compared to the rise of interest from r_2 to r_3 . It is, therefore, clear that when the economy is at lower rate of growth or developmental plateau, fiscal

policies are more effective. On the other hand, even with the same quantum and magnitude of multiplier effect, fiscal policies becomes less effective when the economy is at higher plateau of development or at higher growth rate.

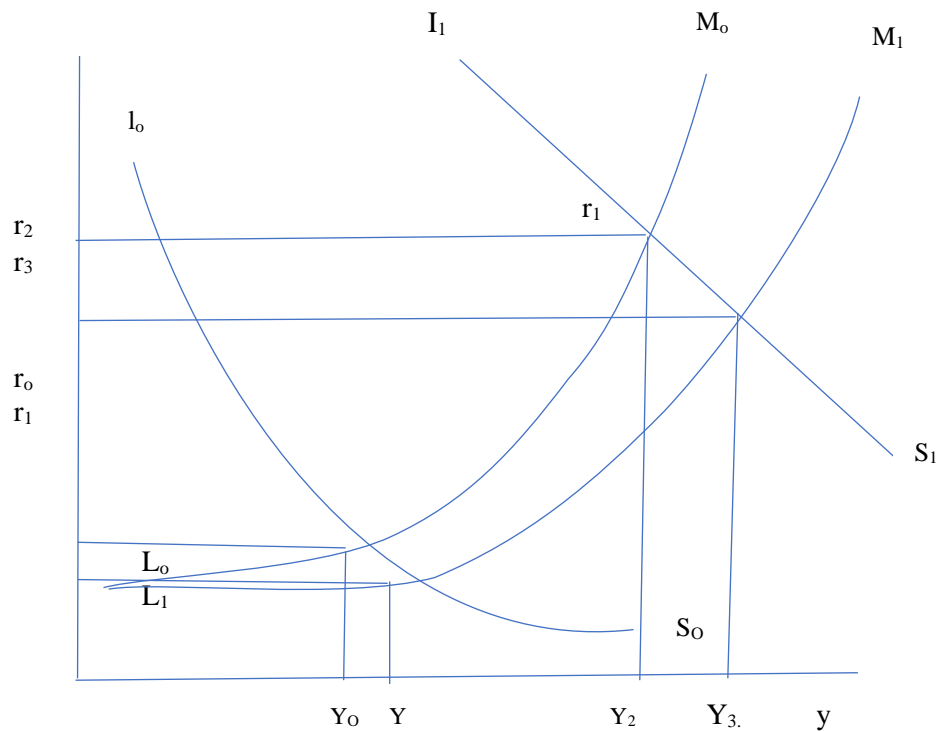
To examine the relative effectiveness of the monetary policy, we keep the IS curve fixed at two extremes i.e. at low and high rate of growth or developmental plateau as I_0S_0 and I_1S_1 respectively as in figure 15. Further it is assumed that both the slopes of IS curves are parallel – implying no change in commodity market. Also, see that L_0M_0 as well as L_1M_1 converges at the minimum rate of interest and becomes almost vertical at the highest end of the curves.

Now, say there has been an increase in the money supply by the authority leading to the shift of LM curve from L_0M_0 to L_1M_1 . Given the IS curve at lower end as I_0S_0 , the increased money supply and the shifts of LM curve leads to output expansion from y_0 to y_1 concomitantly with a fall in the interest rate from r_0 to r_1 . At the other end of higher level of output growth, the initially the pair of equilibrium interest rate and output level is at r_2 and y_2 . However, due to increased money supply, the rate of interest has fallen from r_2 concomitantly with the increased output from y_2 to y_3 . It is, therefore, observable that monetary policy does not have significant bearing upon output expansion and interest rate at the lower ebb of growth and development compared to that of higher end.

Here in the figure, increased money supply and shift of LM curve reduces rate of interest and enhances the output. However, comparing the magnitude of fall in rate of interest from r_2 to r_3 is relatively much larger than from r_0 to r_1 . Also, the expansion of output from y_0 to y_1 is much less compared to expansion from y_2 to y_3 .

Thus the relative effectiveness of fiscal and monetary policy depends upon not only the magnitude of multiplier or output expansion due to interest rate

FIGURE 15 Impact of Expansionary Monetary Policy



reduction but also upon the level of development and rate of growth of the economy. Usually, the fiscal policy will counteract well when the economy is at the lower ledge of growth and development, whereas, monetary policy does well when the economy is a developed one or is with a high growth rate. Nonetheless, in real world macroeconomics an admixture of both the policies are followed with little bias towards one or the other depending upon the context to be applied upon.

2.7 Extension of IS-LM Model to Labour Market and Flexible Price

In case of extension of IS-LM model it can be extended to labour market and flexible prices. Let us begin firstly by introducing the flexible prices. We know that changes in price level do not directly effect the investment level or behaviour. Also, the savings in this context is assumed to be real savings which depends on real income and this too is not effected directly by the changes in price level. Hence, changes in price level does not have any impact upon the IS curve. However, any change in the price level will have certain influence in the money market and therefore impact the LM curve.

Since demand for real cash is function of level of income and rate of interest, it can be written as

$$m = M/P = L(y, r)$$

Also, the supply of real balance is equal to its demand at an exogenously determined nominal level. Also we assume that the money supply is fixed and does not change. The impact of flexible price level can be illustrated with the help of the figure 16.

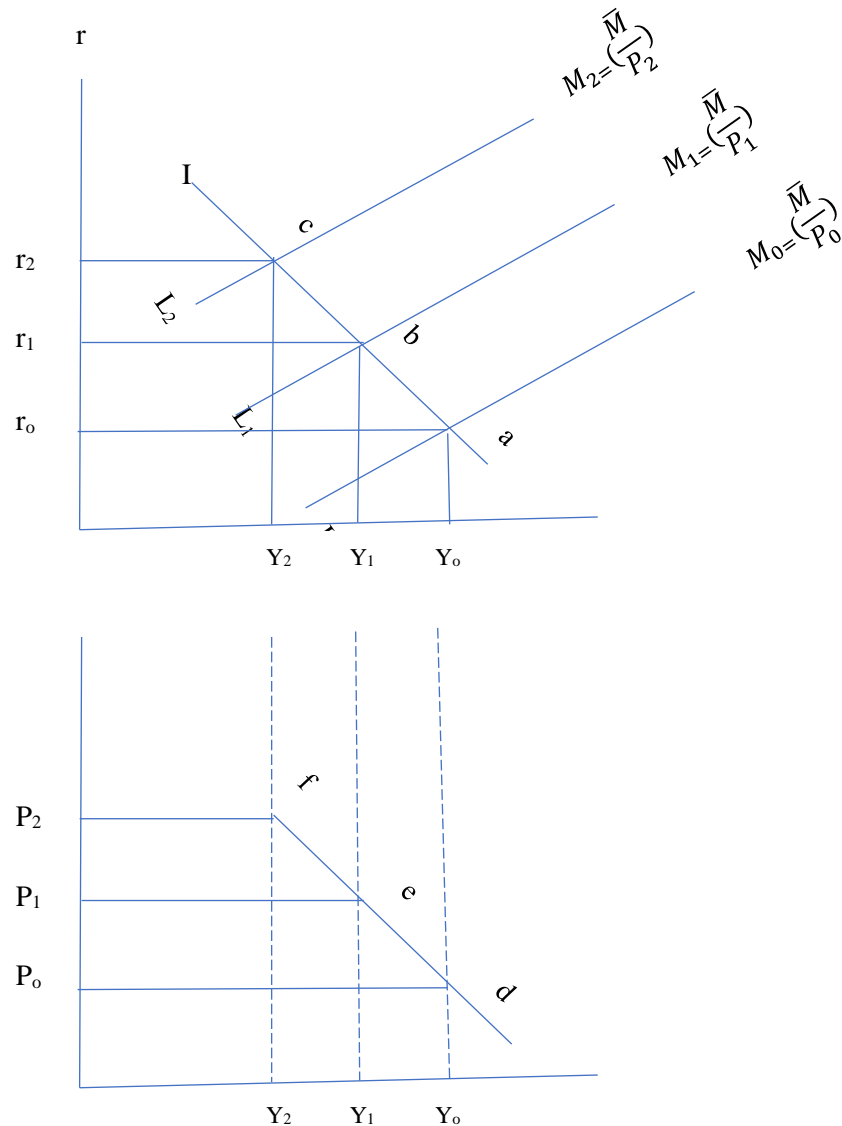
Now, let the initial equilibrium for given level of IS function be at the point of intersection of L_0M_0 , at point a, for a given amount of real money supply $m_0(=M/P)$ with the equilibrium pair of level of income and rate of interest at y_0 and r_0 . Now, for the given money supply, if price level changes, say increases, the real value of money decreases leading reduced supply of real money or balances. As such, the LM curve moves left to L_1M_1 in the upper panel of the diagram and thus a new pair of equilibrium output and rate of interest is determined at point b as y_1 and r_1 , thus, reducing the output from y_0 to y_1 . If price level increases further, this would render the LM curve to further move left to L_2M_2 and so the new level of output is y_2 and rate of interest at r_2 at the equilibrium point c. Concomitantly to it, what is happening in the lower panel of the diagram. See that for the given level of output y_0 and interest rate r_0 , we have a given price level P_0 determined at point d. Similarly, for y_1 and r_2 we get the price level at P_1 and for y_2 and r_2 we have the price level P_2 determined at e and f respectively. Now joining all these points – d, e and f - we get the aggregate supply curve.

In the case of extending the IS-LM model to labour market, we need to make distinction between the classical and Keynesian perception of labour market. The classicals perceived that the supply of labour depends positively upon the real wage rate, $w_c = w_c(W/P)$ thereby automatically adjusting the money wage to keep the economy at full employment level. Unlike the classical Keynes perceived that money wage will not adjust sufficiently to keep the economy at full equilibrium. Thus, there is the case of wage rigidity in labour market which may arise due to contractual arrangements in the labour market. Keynes real wage formulation is based upon the expected price level and can be written as $w_k = w_k(W/P^e)$. In other words, Keynes believed that labour supply will increase only if the money wage increases for a given or constant level of expected price level. Thus, in Keynesian sense workers base their decision upon expected real wage rather than real wage, unlike the classical model where workers are assumed to know the real wage.

Although there is the case of wage rigidity, to understand the dynamics of labour market let us stipulate out first the Keynes effect. The Keynes effect suggests that a decrease in money wage (W) leads to fall in price level (P) leading to increased supply of real balance or money supply ($m = M/P$) and thus resulting into reduced rate of interest and enhanced investment, thereof, the output through multiplier effect.

The Keynesian effect can break down under two circumstances. First, if the economy is operating within the liquidity trap the demand for real balance or money will be perfectly be elastic and an increase in real money supply may not lead to fall of interest rate. Second, in the backdrop of falling interest rates if investment is not responsive, then a falling price level may not necessarily lead to any increased output.

FIGURE 16 IS-LM under Flexible Prices

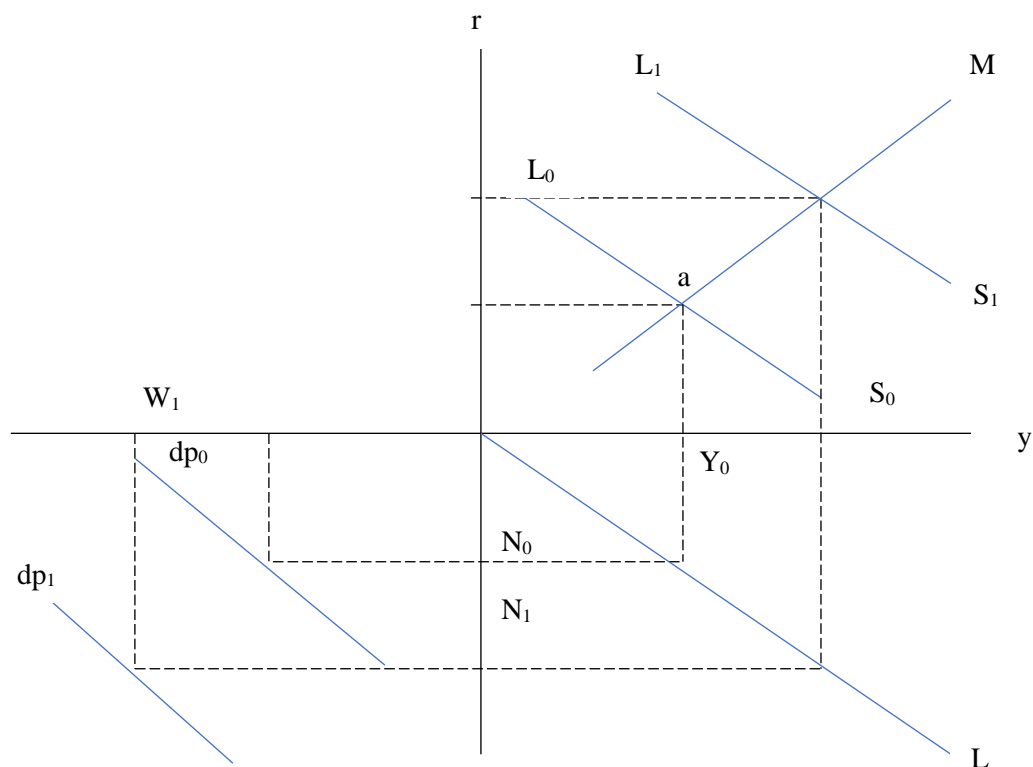


Pigou also pointed out another important argument known as Pigou effect. It states that a falling price level may enhance the value of real money and increase the net wealth and lead to increased consumption. The theoretical implications of Pigou effect is the existence of equilibrium or market clearance solution when there endogenous flexibility in price level as well as the wage rates.

The working of IS-LM in the labour market is illustrated in figure 17. It can be seen that the economy is initially at equilibrium when I_0S_0 intersects the given LM curve at a and the equilibrium rate of interest and income level are determined at r_0 and y_0 . in the lower panel, the ray from the origin OL is the output labour ratio. As such, for the equilibrium level of output y_0 the employment level is determined at N_0 with the wage rate for that level of price at W_0 . Now, imagine a situation wherein either the investment [$i=i(r)$] increases or say the government expenditure increases. Under the circumstances, the IS curve will shift outwards towards right. Let such shift of IS curve be of

the magnitude I_1S_1 , thus determining the equilibrium level of output and rate of interest at y_1 and r_1 . Since, the IS curve has shifted out leading to output expansion, this will concomitantly also ensure the expansion of employment to N_1 , therefore, wage rate at W_1 . Remember that, LM is given and there is no increased money supply but greater employment as so larger wage bills in the economy. This may lead to changed price level due to competitive purchases of consumption (the changed prices are given as dp_0 and dp_1).

FIGURE 17 Employment and Wages



2.8 Mundel Fleming Model

So far we have seen the IS-LM model which is basically a closed economy model. Once we include the external sector of the economy the model becomes what is known as the Mundell-Fleming model. The model is also known as the IS-LM-BoP model where BoP is Balance of Payment or the Net Exports Sector (N_x) of the economy (wherein $N_x = X - M$ and X as well as M symbolically represents the exports and imports respectively).

Even though both economists researched about the same topic, at about the same time, both have different analyses. Mundell's paper 'Capital Mobility and Stabilization Policy under Fixed and Flexible Exchange Rates' (1963), analysed the case of perfect mobility of capital, while Fleming's article 'Domestic Financial Policies under Fixed and under Floating Exchange Rates' (1962), was more realistic

as it assumed imperfect capital mobility, and thus made this one a more rigorous and comprehensive model. However, Fleming's model lost cogency, as the actual world situation today resemble more with capital mobility, which corresponds better to Mundell's view.

In order to understand how this model works, let us first see how the IS curve, which represents the equilibrium in the goods market works under open economy. Secondly, the LM curve in the money market and, thirdly the BP curve which represents the equilibrium of the balance of payments. Finally, we will analyse how the equilibrium is reached.

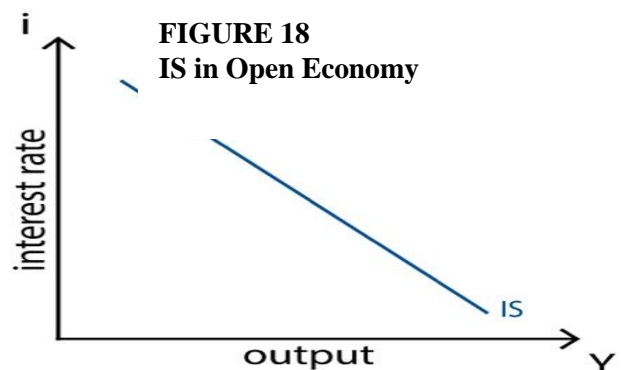
In an open economy, the equilibrium condition in the market for goods is that production (Y), is equal to the demand for goods, which is the sum of consumption ($C = C(Y-T)$), investment (I), government spending (G) and net exports ($N_x = (X-M)$). This relationship is called IS. If we define consumption (C) as $C = C(Y-T)$ where T corresponds to taxes, the equilibrium would be given by:

$$Y = C(Y-T) + I + G + N_x$$

Now, in addition to what we have in the IS-LM model is the net exports. Hence, we take into account the exchange rates, which directly affect net exports. Let's say e is the domestic price of foreign currency or the exchange rate i.e. units of our own currency to receive one unit of foreign currency. The new relationship is expressed as follows (where i is the interest rate):

$$Y = C(Y-T) + I(Y, i) + G + NX(e)$$

If we keep in mind the equivalence between production and demand, which determines the equilibrium in the market for goods, and observe the effect of interest rates, we obtain the IS curve. This curve represents the value of equilibrium for any interest rate. An increasing interest rate will cause a reduction in production through its effect on investment. Therefore, the curve has a negative slope (Figure 18).



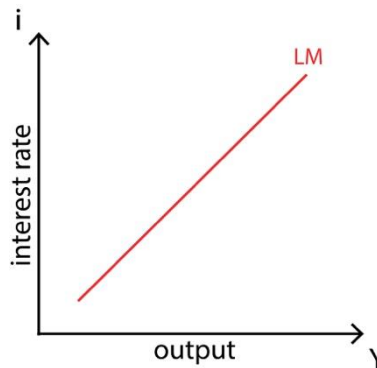
We also need to analyse behaviour of changes in exchange rates (e). If e decreases, then the domestic economy is able to buy more foreign currency with less of its own currency. Contrast to it, the foreigners will pay more of their currency to buy our domestic currency.

Therefore, when e decreases, also called an appreciation under flexible exchange rates or a revaluation under fixed exchange rates, domestic residents have more purchasing power. This enables the domestic economy to buy the same amount of goods using less domestic currency. The opposite is true when e increases (also called a depreciation under flexible exchange rates or a devaluation under fixed exchange rates). Under the circumstances, domestic residents will pay more for the same amount of goods. To sum up, an increase in e causes net exports to increase (IS curve shifts to the right) and a decrease in e causes net export to decrease (IS curve shifts to the left).

The LM curve represents the relationship between liquidity and money. In an open economy, the interest rate is determined by the equilibrium of supply and demand for money i.e. $m = M/P = L(i, Y)$ considering M the amount of money offered, Y real income and i real interest rate, and L representing the functional mapping of demand for money, which is function of i and Y . Also, the exchange rate must be analysed since it affects money demand (investors may decide buy or sell bonds in a country depending on the exchange rate).

The equilibrium of the money market implies that, given the amount of money, the interest rate is an increasing function of the output level. When output increases, the demand for money raises, but, as we have said, the money supply is given. Therefore, the interest rate should rise until the opposite effects acting on the demand for money are cancelled, people will demand more money because of higher income and less due to rising interest rates. The slope of LM curve is positive and reflects the positive relationship between output and interest rates (Figure 19).

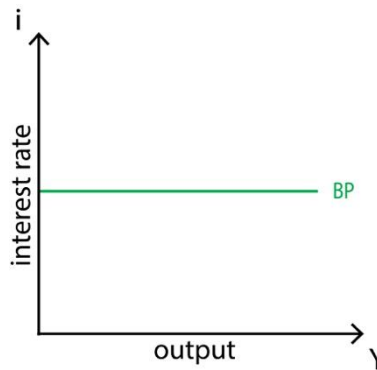
FIGURE 19
LM in Open Economy



The BP curve shows the point where the balance of payments is at equilibrium. In other words, it shows combinations of production and interest rates that guarantees the balance of payments as being viably financed. In other words, the volume of net exports which effect the total production must be consistent with the volume of net capital outflows. It will usually slope up reflecting the fact that higher the production, the higher will be the imports, which causes disturbances in the equilibrium of the balance of payments unless interest rates rise to cause capital inflows to maintain the equilibrium. However, depending in how great the mobility of capital is, it will have a greater or smaller slope i.e. the higher the mobility, the flatter the curve is and vice-versa.

Once the BP curve is derived for the equilibrium BoP, any point above the BP curve reflects a balance of payments surplus while any points below it means a balance of payments deficit. This is important as such deviation from equilibrium BoP curve have important bearing upon the interest rates. The BP curve for equilibrium BoP is given in figure 20.

FIGURE 20
BP Curve when BoP is at equilibrium



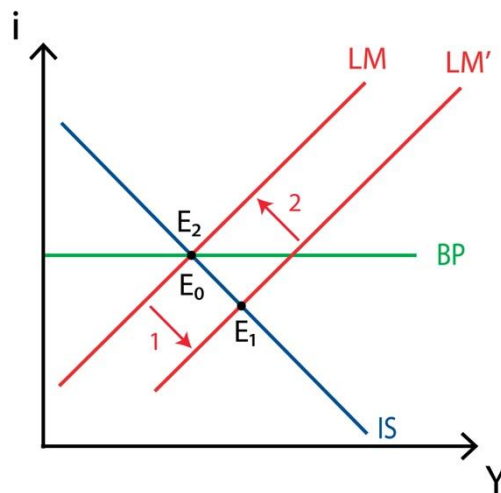
The IS-LM-BP model

In the model we distinguish between perfect (Mundell Model) and imperfect capital mobility (Fleming Model), but also between fixed and flexible exchange rates. For each of these cases, let us see the dynamics when either an expansionary monetary policy or fiscal policy are applied to the economy.

Perfect Capital Mobility and Fixed Exchange Rate

An expansionary monetary policy will shift the LM curve to LM' and move the equilibrium from point E₀ to E₁. Now, as the equilibrium E₁ lies below the BP curve, there is deficit in the balance of payments. Since exchange rates are fixed, government intervention is required to correct the deficit. Hence, the government will purchase domestic currency and sell foreign currency and this reduce the money supply thereby shifting the LM' curve to its original position at which the equilibrium is at E₂. Monetary policy, therefore, has no effect under these circumstances.

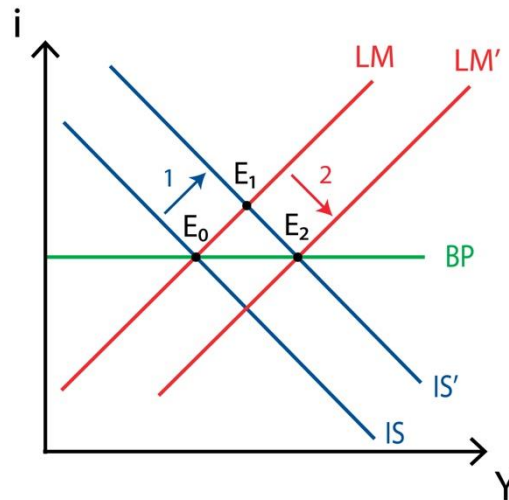
FIGURE 21
Expansionary Monetary Policy



An expansionary fiscal policy will shift the IS curve to IS', thus moving the equilibrium from E₀ to point E₁. The economy has now a balance of payments surplus, as the equilibrium lies above the BP curve. Because the exchange rate is fixed, government intervention will be in terms of purchasing foreign currency by selling the domestic currency. This will increase the money supply and shift the LM curve to the right. The final equilibrium is reached at point E₂ at which the same interest rate, production has increased greatly. Thus, fiscal policy works

perfectly under these circumstances i.e. under perfect capital mobility but fixed exchange rates.

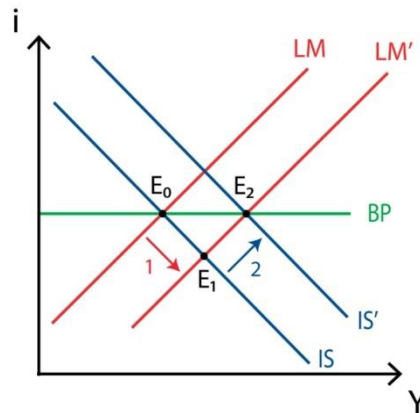
**FIGURE 22
EXPANSIONARY FISCAL POLICY**



Perfect Capital Mobility and Flexible Exchange Rates

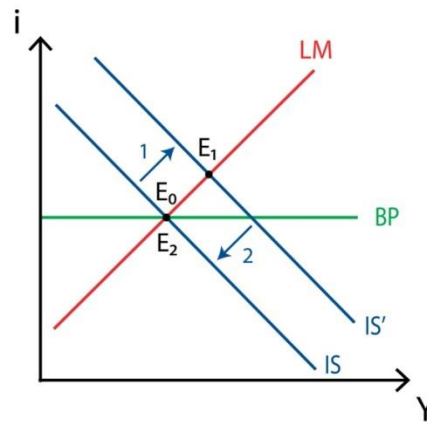
An expansionary monetary policy will shift the LM curve to LM', and move the equilibrium from point E₀ to E₁. Now, as the exchange rates are flexible, we have a different situation. The deficit in the balance of payments will lead to depreciation of the domestic currency. As such, net exports will increase as foreigners can now buy more of our products with the same amount of money. This on the other hand will shift the IS curve to the right (to IS'). The final equilibrium is reached at point E₂ where for the same interest rate, production has increased greatly. Thus, under perfect capital mobility with flexible exchange rates monetary policy works perfectly.

**FIGURE 23
EXPANSIONARY MONETARY POLICY**



An expansionary fiscal policy will shift the IS curve to IS', moving the equilibrium from point E₀ to point E₁. The economy will, therefore, have a balance of payments surplus. The surplus in the balance of payment under flexible exchange rate will appreciate the domestic currency. Thus, there will be a decrease in net exports as the domestic economy is now able to import more with less money, while foreigners will import less of our products (domestic exports) because of appreciated domestic currency. This drop in net exports will shift the IS' curve back to its original equilibrium at E₂. There is no output or production expansion and therefore fiscal policy is ineffective in this case.

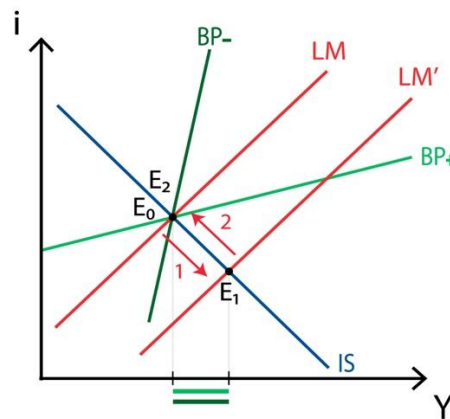
FIGURE 23
EXPANSIONARY FISCAL POLICY



Imperfect Capital Mobility and Fixed Exchange Rates

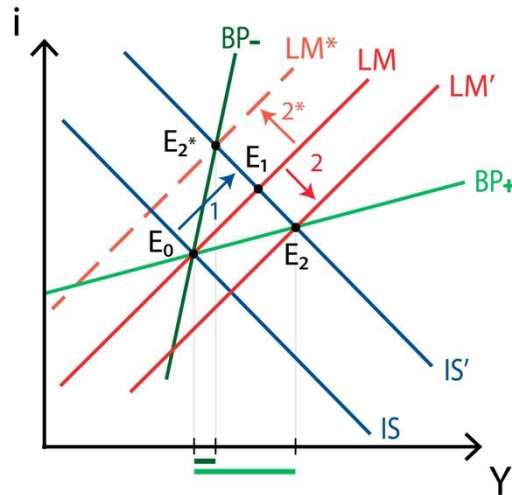
Here we have the exact same situation as before. An expansionary monetary policy will shift the LM curve to LM', thus moving the equilibrium from point E₀ to E₁. As E₁ is below the BP curve, the economy has a balance of payments deficit. Since the exchange rates are fixed, government purchases the domestic currency and sell the foreign currency. This will drop the money supply, thereby, shifting the LM' curve to its original position and equilibrium to E₂. Monetary policy under imperfect capital mobility and fixed exchange rate, therefore, has again no effect, no matter how great or small the capital mobility is.

FIGURE 24
EXPANSIONARY MONETARY POLICY



An expansionary fiscal policy will shift the IS curve to IS' so that equilibrium moves from E₀ to E₁. In this case, depending upon the extent and degree of capital mobility - the balance of payments can be a surplus one when high capital mobility exists (BP+ curve) or the balance of payments can be in deficit when capital mobility is low (BP- curve). As exchange rates are fixed, government will need to intervene by either acquisitions or by disposals of both domestic and foreign currency so as to shift the LM curve to either LM' or to LM*. In fact, a balance of payments surplus is the same scenario as in a fiscal policy with perfect capital mobility and fixed exchange rates. whereas, the balance of payments deficit corresponds equivalently to the monetary policy scenario under fixed exchange rate. Hence, it can be interpreted that under imperfect capital mobility and fixed exchange rate, the fiscal policy is more efficient compared to monetary policy. Also, the fiscal policy will be more efficient in proportion to the degree and extent of capital mobility i.e. higher the capital mobility, more efficient will be the fiscal policy.

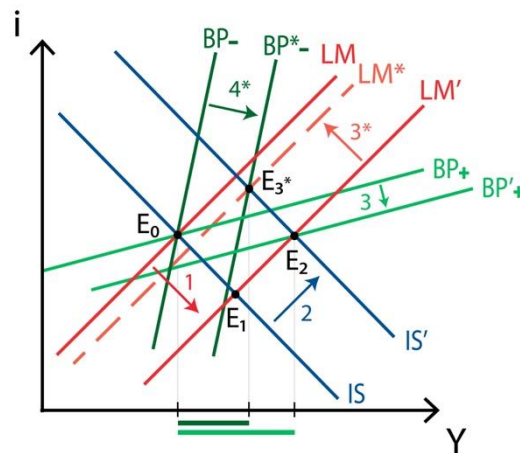
**FIGURE 25
EXPANSIONARY FISCAL POLICY**



Imperfect Capital Mobility and Flexible Exchange Rates

An expansionary monetary policy will shift the LM curve to LM', and move the equilibrium from point E0 to E1. As exchange rates are flexible, the balance of payments deficit will depreciate the domestic currency leading to an increase in net exports. This shifts the IS curve to IS'. Further, as domestic assets are less expensive now, the BP curve will shift to the right towards either BP'+ or BP'- . Therefore, with high capital mobility, final equilibrium will be at point E2. Hence, under flexible exchange rate with high capital mobility the monetary policy works efficiently and turns out to be more efficient when there is higher capital mobility.

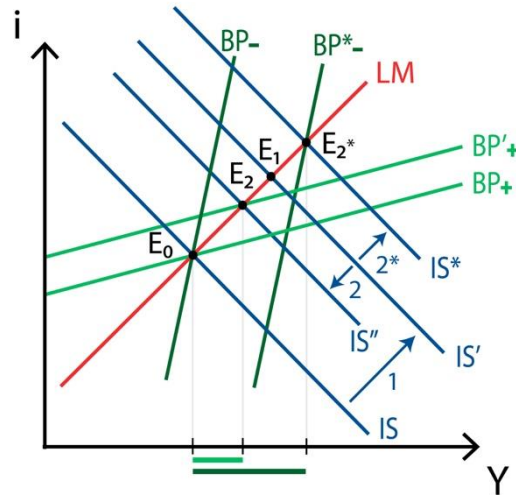
**FIGURE 25
EXPANSIONARY MONETARY POLICY**



An expansionary fiscal policy shifts the IS curve to IS', moving the equilibrium from E0 to point E1. Now, depending upon capital mobility, the balance of payments can be a surplus (high capital mobility, BP+ curve) or a deficit (small capital mobility, BP- curve). In the case of a balance of payments surplus with flexible exchange rates, there will be an appreciation of the domestic currency. This reduces the net exports, shifting the IS' curve to the left. Also, as domestic assets are more expensive now, the BP+ curve will shift to the left. The final equilibrium, therefore, occurs at E2. On the other hand, if there is a balance of payments deficit (the case for the BP- curve), the result will be the same one as in the monetary policy case where the equilibrium is reached at E2*.

Thus, when capital mobility is low under flexible exchange rate, the fiscal policy are more efficient than monetary policy.

FIGURE 25
EXPANSIONARY FISCAL POLICY



The implication of Mundell-Fleming model give rise to what is known as the impossible trinity. In simple words, it suggests that no economy can have all the following three, namely, a perfect capital mobility, fixed exchange rates and an independent and efficient monetary policy. Under the perfect capital mobility, in order to have an efficient monetary policy, exchange rates must be flexible or else one should be accept inefficient monetary policy and be under fixed exchange rates.

Let Us Sum Up

This model discussed about the classical and Keynesian theories of interest. The classical theory states that interest rate is determined by the real factors like forces of demand and supply of capital. On the other hand, Keynesian theory states that interest rate is a monetary phenomenon and points out three motives of demand for money. It states that speculative demand for money is inversely related to interest rate. IS-LM model shows that general equilibrium in an economy is determined by the interaction of IS and LM curve. IS curve shows equilibrium in product market, whereas LM curve shows equilibrium in the money market. The model shows that relative effectiveness of monetary and fiscal policies are determined by the slope of IS and LM curve. Expansionary fiscal policy leads to shift in IS curve and expansionary monetary policy leads to shift in LM curve. Mundell-Fleming model presents the conditions necessary for maintaining equilibrium in an open economy.

Keywords

Speculative demand for money: It refers to demand to hold money for speculative purpose with the aim to earn income by investing fund. It is inversely related to interest rate.

IS Curve: It shows a various combination of income and interest rate at which saving and investment are equal.

LM Curve: It shows a various combination of income and interest rate at which demand for money and supply of money are equal.

Fiscal Policy: It refers to the policy of the government relating to tax, public expenditure and public debt which aims to influence the level of economic activity.

Monetary Policy: It refers to the policy of the central bank which aims to influence the level of economic activity through changes in demand and supply of money.

BP Curve: The BP curve shows the point where the balance of payments is at equilibrium. It shows combinations of production and interest rate that guarantees the balance of payments equilibrium.

Short Questions

1. Explain transaction and precautionary demand for money.
2. What do you mean by speculative demand for money?
3. Derive IS curve.
4. Derive LM curve.
5. Distinguish between fixed and floating exchange rate.

Long Questions

1. Critically discuss the classical theory of interest.
2. Examine the Keynesian theory of interest.
3. Analyse simultaneous equilibrium in goods and money market with the help of IS-LM curve.
4. Show the relative effectiveness of monetary and fiscal policy using IS-LM curve.
5. Discuss Mundell-Fleming model for equilibrium of an open economy.

Suggested/Further Readings

1. Shapiro, Edward, *Macroeconomic Analysis*, Galgatia Publication, New Delhi, 1996.
2. Branson, W. H., *Macroeconomic Theory and Policy*, Universal Book Stall, New Delhi, 1979.
3. Keynes, J. M., *General Theory of Employment, Interest and Money*, Macmillan, London, 1936.
4. Frayen R.T., *Macroeconomics: Theories and Policies*, 8th Edition, Pearson Education, 2009

UNIT III: Theories of Consumption

Structure

- 3.1 Introduction
- 3.2 Extension of Keynesian Consumption Function into Long run
- 3.3 Relative Income Hypothesis
- 3.4 Permanent Income Hypothesis
- 3.5 Life Cycle Hypothesis

3.1 Introduction

Theories of consumption explain the factors determining the consumption expenditure of an individual or a household or a society. The classic consumption function put forwarded by Keynes, suggests that consumers' spending is wholly determined by their income and the changes in their income. If this explanation is true, the aggregate consumption as well as aggregate savings should increase along with increase in gross domestic product (GDP) over time. Latter, some other economists also put forwarded their theories of consumption. Some of those theories are discussed below.

3.2 Extension of Keynesian Consumption Function into Long run

Keynes' theory of consumption has its root in the psychological law of consumption. Keynes stated that the current level of consumption is the function of current absolute level of income.

$$C_t = f(Y_t) \dots\dots \dots (3.1)$$

$$C_t = a + b Y_t \dots\dots \dots (3.2)$$

Where,

C_t = the level of consumption in the period t

a = autonomous consumption i.e. consumption independent of income, where $a > 0$

b = the marginal propensity to consume, where $0 < b < 1$

Y_t = the income level at period t

Keynes' theory of consumption is also known as the absolute income hypothesis of consumption. Basic characteristics of Keynesian theory of consumption are:

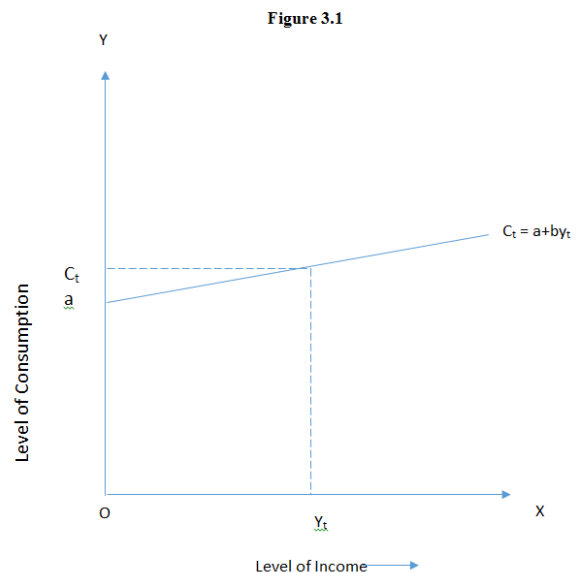
- (i) Current consumption is the function of current income.
- (ii) Consumption income relationship is reversible. It means that along with increase in income, the consumption expenditure increases; and along with decline in income, the consumption expenditure

decreases in the same rate it increased. Let, the current income of an individual is Rs.100 and his current consumption expenditure is Rs.80. Suppose, his income is increased to Rs.150. Along with this increased income, his consumption expenditure increases by Rs.30 to Rs.110. According to absolute income hypothesis, if there is a decline in his income by Rs.50 in future, his consumption expenditure will decline to Rs.80.

- (iii) Consumption expenditure of an individual is independent of the other individuals in the society. In other words, an individual never try to imitate the consumption pattern of any other individual in the society.

The Keynesian theory of consumption can be explained with the figure: 3.1. In the figure level of income is measured along the horizontal axis and level of consumption is measured along the vertical axis. It shows that along with increase in income, level of consumption (expenditure on consumption) also increases. But the increase in consumption is less than that of increase in income. In other words, average propensity to consume declines along with increase in income.

Thus, one of the basic conclusions of Keynesian theory of consumption is that along with increase in income the average propensity to consume (APC) declines. So, from the macroeconomic point of view, along with increase in income of a society over the period, its APC should decline. However, it is not found in reality. Time series analyses indicates that APC in most of the countries has increased over the years. These findings raise questions regarding the validity of Keynesian theory of consumption. However, there some other factors which give explanations for such findings. These are:



- (a) **Wealth Accumulation:** Over the period, households accumulate more and more wealth. The increased wealth of the households encourages them to spend more corresponding to a definite level of income. So, a household with the same level of current income spend more on consumption along with increase in asset level.
- (b) **Urbanization:** Along with economic growth, the percentage of population lives in the urban area is increased. The people in the urban areas spend larger percentage of their income on consumption compared to their rural counterpart. So, the percentage of income spend by the people of a country on consumption is increased along with urbanization.
- (c) **New Products come to the market:** With the passes of time new technologies come to the market and new technologies results in new products. These new products create market for themselves. So, even if income does not increase it leads to an increase in consumption expenditure. For example, earlier there was no mobile phone. Till 7/8 years ago most of the people has a simple mobile and during last 7/8 years everyone had an android mobile. Thus, there was no cost on mobile phone till the end of last century

(twenty years' age), and today everyone is spending a reasonable amount on mobile bill. Thus, when new products come to the market it increases consumption expenditure.

- (d) **Increased percentage of elderly people in total population:** Along with economic development, the longevity of the people also increases. Increased longevity of the population increases the number of elderly people in the society. The average income earned by the elderly population is significantly lower, but the average consumption expenditure of the elderly population does not decline at the same rate. So, along with increase in the number of elderly population, the average propensity to consume of the society increases.

All the above mentioned four factors cause a shift in the short run consumption functions. It can be seen from the following figure 3.2.

In Figure 3.2 we measure income on the x axis and consumption on the Y axis. Let, SC1 is the consumption function in the initial period. Corresponding to SC1 consumption curve, the consumption expenditure of the society is aY_1 at Y_1 level of income. In the second period, due to the above mentioned factors the consumption curve shifts to SC2. Suppose, in the second period the income of the society has increased from Y_1 to Y_2 .

Corresponding to the short run consumption function SC1 the level of consumption at Y_2 level of income is dY_2 . But due to the shift in consumption function to SC2 the level of consumption at Y_2 level of income is increased to bY_2 . In the third period, the consumption function has shifts to SC3 and the society is consuming at point c corresponding to Y_3 level of income. Now, if we connect a, b and c points on the short run consumption functions, we get the long run consumption curve LC. LC indicates the long run proportional relationship between consumption and income. Further, there is no change in average propensity to consume along with increase in income level of the society. The long run consumption function starts from the origin indicates that in the long run if someone's income is zero, his consumption expenditure will also be zero.

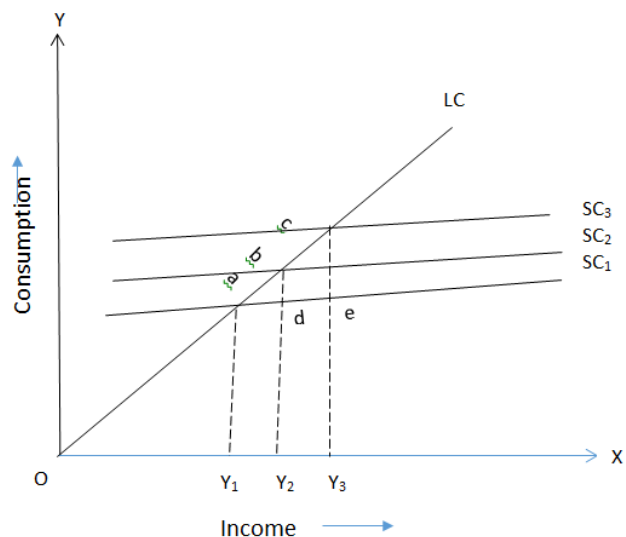
Keynes theory of consumption is criticized on the following ground:

- (i) According to Keynes, consumption expenditure of an individual is independent of the other individuals in the society; which is not correct.
- (ii) Keynes stated that income consumption relation is reversible, which is not correct.

3.3 Relative Income Hypothesis

Relative income hypothesis was put forwarded by James Duesenberry. According to him, the consumption expenditure of an individual (household) depends not on the absolute level of income, but on his relative income position in the society. In other words, the pattern of consumption (consumption expenditure) of an individual is

Figure 3.2: Derivation of Long run consumption Curve



affected by the pattern of consumption of the other individuals in the society. Because people follow the consumption pattern of other individuals in the society. This is known as demonstration affect. For example, which cell phone one individual student of a university is using depends on the quality of the cell phone used by the other students of that university. Therefore, a family with definite level of income residing in a rich society spend more on consumption compared to another family with equal level of income residing in a poor society. According to relative income hypothesis, if the income of all the families' in a society increases at the same rate, the relative position of each household on the income scale remains unchanged. In such situation, the division of income between consumption and saving remain unchanged. In other words, the average propensity to consume (APC) does not change. However, if the income of a particular family remains unchanged, but income of the other families' rise, the income position of that family relative to that of other families is deteriorated. The deterioration in the relative income position of the family would lead to a rise in the fraction of its income devoted to consumption, despite of the fact that there has been no change in its absolute income.

The average propensity to save function of a household is given as:

$$APS = \alpha + \beta \frac{Y}{Y_c} \quad \dots\dots \quad \dots \quad (3.3)$$

Where,

Y= Average income of the Household

Y_c = Average income of the community

α = saving coefficient independent of income

β = marginal propensity to save

Given the average propensity to save function in equation (3.3), the average propensity to consume function will be:

$$APC = 1 - APS$$

$$APC = 1 - \alpha - \beta \frac{Y}{Y_c} \quad \dots\dots\dots \quad (3.4)$$

From equation (3.4), it can be seen that given the income of the household (Y), the average propensity to consume of the household increases along with increase in the average income of the community (Y_c); and vice versa. Similarly, given the average income of the community, the average propensity to consume (APC) of the household increases along with decline in its income and vice-versa.

Ratchet effect and relative (past) income hypothesis

Ratchet effect states that it is easier to increase the consumption expenditure, but it is difficult to reduce it. Because, an individual (community) may move from a lower standard of living to a higher standard of living; however, it is difficult to move from a higher standard of living to a lower standard of living. In other words, the consumption income relationship is not reversible. With the concept of ratchet effect, we may have an aggregative explanation of the relative income hypothesis. Here, we consider the present income of the community relative to the peak income level previously attained by the community. In other words, when this hypothesis is extended

from individual consumer's behavior to aggregate behavior, the ratio of consumption to income (APC) becomes dependent on the ratio of the current income level of the community to the peak income level previously attained by the community. Thus, for the community as a whole, the present level of consumption is the function of present income and the peak income level previously attained by the community.

$$C_t = f(Y_t, Y_0)$$

The average propensity to save or saving function of the community is given in the following equation:

$$APS = \frac{S_t}{Y_t} = a \frac{Y_t}{Y_0} + b \dots\dots\dots (3.5)$$

Where,

S_t = current saving

Y_t = Current Income

Y_0 = Previous peak level of income

'a' and 'b' are constants, and $b < 0$

Given, the average propensity to save function in equation (3.5), the consumption function or average propensity to consume is given as follows:

$$APC = 1 - APS$$

$$APC = 1 - \frac{S_t}{Y_t}$$

$$APC = 1 - a \frac{Y_t}{Y_0} - b \dots\dots\dots (3.6)$$

From equation (3.6), it can be seen that APC of the community increases along with the decline in current income, given the peak income level previously attained by the community and vice versa.

3.4 Permanent Income Hypothesis

The permanent income hypothesis of consumption was given by Milton Friedman. According to this theory the expected or future income can influence the consumption spending in the current period. The actual or measured income (Y) has two components: permanent income (Y_p) and transitory income (Y_t). According to Friedman, Permanent income is that amount which the consumer could consume (or believes that it could) while maintaining its wealth intact. Wealth includes both non-human and human wealth; but the former is of major significance in this theory. Wealth has been defined as the discounted sum of all future receipts of income from non-human asset. The perpetual annuity or interest on lump sum of wealth has been described by Friedman as permanent income.

$$Y_p = i.W \dots\dots\dots (3.7)$$

Where, W= wealth and i = rate of return on wealth

If perpetual return on wealth is consumed, the wealth can remain intact.

Transitory income (Y_t) signifies unexpected addition to and subtraction from income or windfall gains or losses.

Friedman considers that consumption to be constituted by the permanent and transitory components.

$$C = C_p + C_t \dots\dots\dots (3.8)$$

Permanent consumption is the value of the services that is planned to consume during the period in question. The transitory consumption (C_t) like Y_t consists of unanticipated additions or subtractions from consumption.

Assumptions:

- The transitory component of income is uncorrelated with permanent income.
- The transitory component of consumption is uncorrelated with permanent consumption.
- There is no correlation between the transitory income and transitory consumption.

In short, permanent consumption is related only to permanent income, as the unexpected additions and subtractions in income and consumptions over a long period get cancelled out and C_p varies in proportion to Y_p

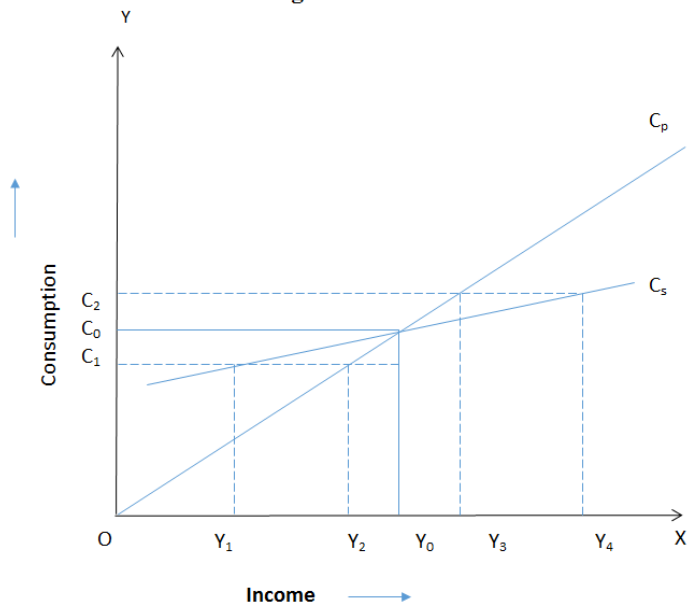
$$C_p = k Y_p \dots\dots\dots (3.9)$$

Where, k is the proportionality coefficient between C_p and Y_p . This relationship is derived from a simplifying assumption taken by Friedman that utility function is homogeneous so that planned or permanent consumption is directly proportional to W .

Given the relationship of proportionality, the long run APC for the community equals the long run MPC for the whole community. Moreover, k is not a constant. It changes with change in age structure of the population, the rate of interest at which the consumer could borrow or lend, and the ratio of non-human wealth to permanent income. The short run non-proportionate and long run proportionate relationship between consumption and income given by permanent income hypothesis can be shown with the help of Figure 3.3.

In Figure 3.3, income is measured along the horizontal axis and consumption expenditure on the vertical axis. C_s is the Keynes' short run consumption function and C_p is the long run consumption function given by permanent income hypothesis. According to Keynes' absolute income hypothesis, OC_2 level of consumption expenditure is corresponding to OY_4 level of income. But according to permanent income hypothesis OC_2 level of consumption expenditure is corresponding to OY_3 level of permanent income. According to permanent income hypothesis, Y_3Y_4 is the positive transitory income which has no impact on consumption expenditure. Similarly, according to absolute income hypothesis OC_1 level of consumption expenditure corresponds to OY_1 level of short run income. However, according to permanent income hypothesis OC_1 level of consumption expenditure is corresponding to OY_2 level of permanent income; where Y_1Y_2 is the

Figure 3.3



positive transitory income which has no impact on consumption expenditure. Similarly, according to absolute income hypothesis OC_1 level of consumption expenditure corresponds to OY_1 level of short run income. However, according to permanent income hypothesis OC_1 level of consumption expenditure is corresponding to OY_2 level of permanent income; where Y_1Y_2 is the

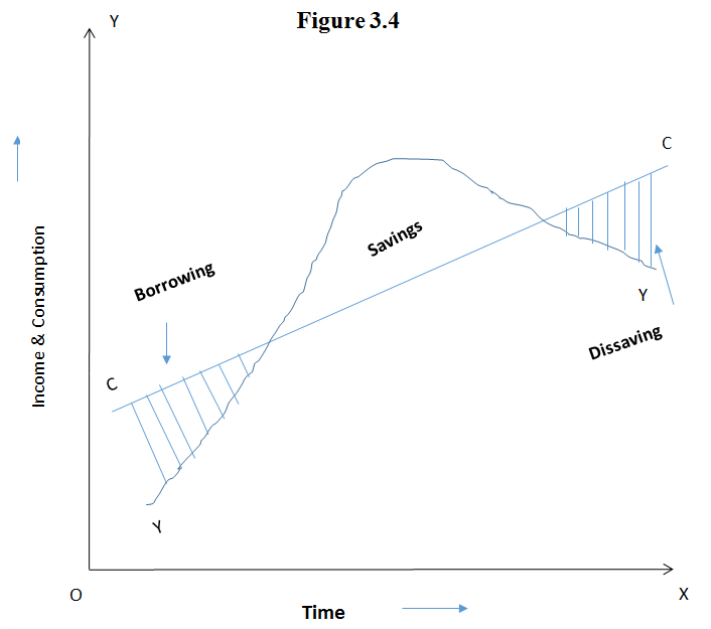
negative transitory income. This negative transitory income does not have any impact on consumption expenditure. Households with OY_0 level of income, have consumption expenditure OC_0 . These households do not have any transitory component in their income. So, the short run consumption function is equal to long run consumption function.

The criticisms put against the permanent income hypothesis are:

- (i) The assumption of zero correlation between transitory income and transitory consumption is highly criticized. Because, if someone wins a lottery there is more probability to spend in on consumption than saving it in the banks.
- (ii) The time span for determination of permanent income has led to much controversy.

3.5 Life Cycle Hypothesis

Man is a forward looking animal. He plans not only for today, but also for his entire life time. People does not earn anything in the early years of their life. During those days, they consume by borrowing from their parents or guardians. They earn during the mid-period of their life. During these days they earn more than they consume. They repay the amount they borrowed in the previous period and saves for the future. Similarly, in the olds ages people consumes more than they earn. These days they dis-saves and consumes. It can be explained with the help of the figure 3.4. In the figure, CC indicates consumption function and YY indicates the income. The income fluctuates from time to time, but consumption grows at a constant rate.



When the individual earns and saves, the stock of wealth with the person increases. The stock of wealth is maximized at the time he stops earning. Thereafter, there is a decline in the stock of wealth as the person consumes out of saving. In other words, along with dissaving the stock of wealth declines. The consumption income relationship given by life cycle hypothesis, is given by the following equation:

$$C_t = k \cdot V_t \quad \dots\dots\dots (3.10)$$

In equation (3.10)

C_t = Consumption in the period t.

V_t = Present value of the resources accruing to the individual over rest of his life time.

k = Coefficient which indicates the proportionate relationship between C_t and V_t .

Where,

$$V_t = A_t + Y_{Lt} + Y_{Lt}^e \quad \dots (3.11)$$

A_t = the value of all property assets during period t

Y_{Lt} = Labour or non-property income during period t

Y_{Lt}^e = Present value of labour (non-property) income accrue to the individual in future

Suppose, there is a proportionate relationship between the labour income in the present and future period as given by equation (3.12).

$$Y_{Lt}^e = \beta Y_{Lt} \quad \dots (3.12)$$

Again the expected future income is related to the number of years (T) the person will be on job. So, equation (3.12) may be written as

$$Y_{Lt}^e = (T-1) \beta Y_{Lt} \quad \dots (3.13)$$

So,

$$V_t = A_t + Y_{Lt} + (T-1) \beta Y_{Lt}$$

Or,

$$V_t = A_t + [1 + (T-1) \beta] Y_{Lt}$$

So, the consumption function given in equation (3.10) may be written as

$$C_t = k [A_t + \{1 + (T-1) \beta\} Y_{Lt}]$$

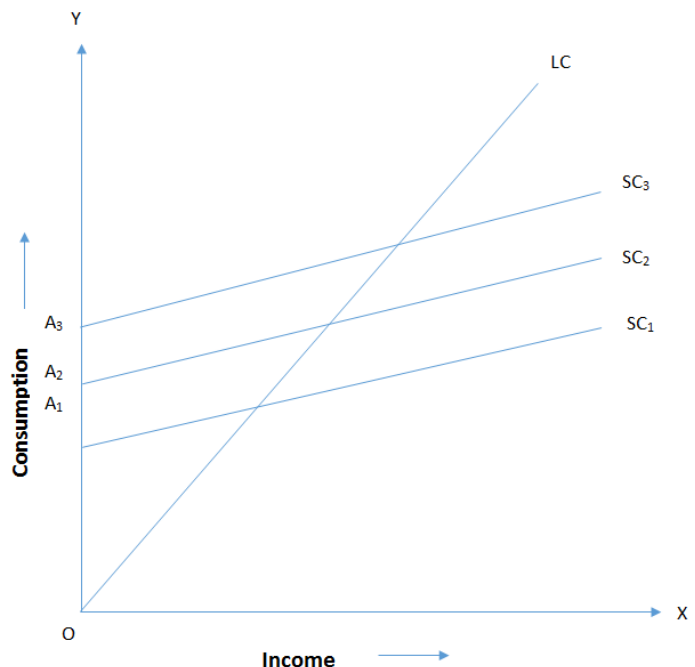
Or

$$C_t = kA_t + k[\{1 + (T-1) \beta\} Y_{Lt}] \quad \dots (3.14)$$

Where, kA_t (indicates the value of assets of the individual) is the intercept of the consumption function. In other words, the consumption function of an individual (or household) shifts if there is an increase in his asset base.

Figure 3.5 shows that when the asset base of the individual is A_1 , the consumption function of the individual is SC_1 . The consumption function of the individual shifts to SC_2 and SC_3 along with increase in asset base to A_2 and A_3 respectively. LC is the long run consumption function, which shows the proportionate relationship between income and consumption expenditure.

Figure 3.5



Let's Sum up

In this chapter, we have learnt the following points:

- (i) Keynes' absolute income hypothesis states about the short run non-

proportionate relationship between consumption and income. The long run extension of Keynesian theory of consumption states proportionate relationship between consumption and income.

- (ii) Relative income hypothesis states that the relative income position of an individual in the society determines his consumption expenditure.
- (iii) Demonstration affect states that individual consumer tries to follow the consumption pattern of other individuals in the society.
- (iv) Ratchet effect states that it is easier to increase consumption expenditure, but it is difficult to reduce consumption expenditure.
- (v) Permanent income is that amount which the consumer could consume (or believes that it could) while maintaining its wealth intact.
- (vi) Transitory income means unexpected addition to and subtraction from income or windfall gains or losses.
- (vii) According to Friedman's permanent income hypothesis, consumption (C_p) is related only to permanent income (Y_p), as the unexpected additions and subtractions in income and consumptions over a longer period get cancelled out and C_p varies in proportion to Y_p .
- (viii) According to life cycle hypothesis of consumption, individual plans their consumption not only for today, but also for his entire life time.

Key terms

Average propensity to consume, marginal propensity to consume, permanent income, transitory income, relative income, and life cycle hypothesis.

Short Questions

1. What is demonstration effect?
2. Define ratchet effect.
3. Define permanent income.
4. Define transitory income and transitory consumption.

Long Questions

1. Critically discuss life cycle hypothesis of consumption.
2. Explain the permanent income hypothesis of consumption. Do you think it as an improvement over Keynesian theory of consumption?
3. Discuss the relative income hypothesis of consumption.
4. Discuss the long run extension of Keynesian theory of consumption.

Suggested Readings

1. Branson, W. H. 2016: Macroeconomic Theory and Policy (Third Edition), East-West Press.

2. Rana and Verma 2014: *Macro Economic Analysis*, Vishal Publications.
3. Shapiro, Edward 2013: *Macroeconomic Analysis*, Thomson Learning.

UNIT IV: Theories of Investment

Structure

- 4.1 Introduction
- 4.2 Payback Period
- 4.3 Present Value Criterion of Investment
- 4.4 Internal Rate of Return
- 4.5 Marginal Efficiency of Capital
- 4.6 Theories of Business Cycle
- 4.7 Schumpeterian theory of Business Cycle
- 4.8 Keynesian theory of Business Cycle
- 4.9 Multiplier Accelerator Theory of Business Cycle

4.1 Introduction

Investment has a very important role in an economy. According to Keynes' it is the most volatile among all macroeconomic variables, as it depends on expectations of the investors. Investment is essentially an asset that is created with the intention of allowing money to grow. Investment may be of two types i.e. gross investment and net investment. Gross investment is the total amount of money spent on assets to produce goods and services. If we deduct the value of depreciation from gross investment, we get net investment. Thus the ultimate objective of investment is to have future return. Investment gives return in two ways; i.e. periodic income generated from that investment and appreciation in the value of that asset. The objective of this chapter is to discuss some concepts of investment.

4.2 Payback Period

The payback period refers to the time an investment project takes to recover its initial cost of investment. In other words, it is the time an investment project takes to reach the breakeven. Account and fund managers use the concept of payback period to decide whether an investment to be made or not. Shorter payback period means more attractive investments, while longer payback periods are less desirable. An example of payback period is given in Table.4.1. Let the initial cost of investment of a project is Rs.100 crores.

Table. 4.1

Time Period	Cash Flow	Cumulative Cash Flow
1	Rs.10 crores	Rs.10 Crores
2	Rs.30 crores	Rs.40 Crores
3	Rs.20 crores	Rs.60 Crores
4	Rs.30 Crores	Rs.90 Crores
5	Rs.10 Crores	Rs.100 Crores
6	Rs.20 Crores	Rs.120 Crores
7	Rs.40 Crores	Rs.150 Crores

In Table. 4.1 the first column gives the time period, the second column gives the annual cash flow and the third column gives the cumulative cash flow. The cumulative cash flow is equal to initial cost of investment (Rs.100 crores) in the fifth year. In other words, the initial cost of investment is recovered after five years. Therefore, the payback period is five years. The most significant advantage of the payback method is its simplicity. It's an easy way to compare several projects and then to take the project that has the shortest payback time. However, it has several limitations as given below:

- (a) The payback period method ignores the time value of money. Let's have an idea about the time value of money. Noted that the value of hundred rupees an investment project is going to give after one year is not equal to the Rs.100 the investor has today. Similarly, the value of Rs.100 an investor will get after one year is not equal to the Rs.100 the investor would get after five years. The future returns are comparable only with the present value of such returns. So, to make some decision regarding an investment project, the investor must have knowledge about the present value of future return. To have the present value of future return, the future return is to be discounted with an appropriate discount rate. The discount rate may be equal to the market rate of interest or rate of inflation.
- (b) The payback period method neglects cash flows received after payback period.
- (c) This method ignores a project's profitability.
- (d) The payback period method does not consider a project's return on investment.
- (e) The payback method is hardly use for evaluation of different projects.

Discounted Payback period

One of the limitations of payback period is that it ignores the time value of money. This limitation of payback period can be addressed with the discounted payback period which considers the time value of money. The

discounted payback period shows how long it will take to recover the initial investment of the project, based on the present value of the project's future cash flows. The shorter the discounted payback period is; the sooner a project or investment will generate cash flows to cover its initial cost.

Table. 4.2

Time	Cash Flow	Discounted cash flow	Cumulative Discounted Cash Flow
1	Rs.10 crores	Rs.10 crores	Rs.10 Crores
2	Rs.30 crores	$\frac{R2}{(1+r)} = \frac{30}{(1+10\%)} = \frac{30}{1.1} = 27.27$	Rs.37.27 Crores
3	Rs.20 crores	$\frac{R3}{(1+r)^2} = \frac{20}{(1+10\%)^2} = \frac{20}{(1.1)^2} = 16.53$	Rs.53.80 Crores
4	Rs.30 Crores	$\frac{R4}{(1+r)^3} = \frac{30}{(1+10\%)^3} = \frac{30}{(1.1)^3} = 22.54$	Rs.76.34 Crores
5	Rs.10 Crores	$\frac{R5}{(1+r)^4} = \frac{10}{(1+10\%)^4} = \frac{10}{(1.1)^4} = 6.83$	Rs.83.17 Crores
6	Rs.20 Crores	$\frac{R6}{(1+r)^5} = \frac{20}{(1+10\%)^5} = \frac{20}{(1.1)^5} = 12.42$	Rs.95.59 Crores
7	Rs.40 Crores	$\frac{R7}{(1+r)^6} = \frac{40}{(1+10\%)^6} = \frac{40}{(1.1)^6} = 22.58$	Rs.118.17 Crores

The discounted payback period of the investment project is shown in Table 4.2. The third column of the table gives the discounted cash flow and the fourth column gives the cumulative discounted cash flow. Here, the discount rate is assumed to be 10 per cent. Noted that the time period 1 indicates the present period, so it need not be discounted. The cumulative discounted cash flow is more than (equal to) the initial level of investment (Rupees 100) in the seventh year. So, the discounted payback period of this project is seven years. Noted that the discounted payback period is longer than the payback period.

4.3 Present Value Criterion of Investment

Investors make investment with the motive to earn profit. It is profitable to invest in a project, if the return of a project is higher than the cost. Generally, investment is done in the initial period of production. And the investment project pay return over a longer period of time. However, it is not appropriate to simply compare the future receipts with the present investment expenditure. One of the methods is to compare the present cost of investment with the present value of future receipt. If we discount future receipt with some discount rate, then we have the present value of future return. Let an investment project gives return of Rs.105 after one year. To know the present value of this future receipt, we have to discount the future return:

$$PVR = \frac{R}{(1+r)^n}$$

Where, R= Future return

r= Discount rate (%)

n = Number of Years

Let the discount rate is 10%

Then, the present value of Rs.105 i.e. the return from the project after one year is

$$PVR = \frac{105}{(1+10\%)^1}$$

$$PVR = \frac{105}{(1+0.10)} = \frac{105}{1.1} = 95.45$$

Having present value of future receipt, we can compare the PVR with the initial cost. If the PVR is higher than the initial cost, it is profitable to invest in that project.

Discount Rate: It is the rate (%) used to derive the present value of future return. However, there is no definite rule regarding what should be the discount rate, it depends on the investor. Generally, market rate of interest is used as discount rate. The rate of inflation may also be used as the discount rate.

Let a project gives return of Rs.100 in the present year and Rs.100 in 2nd, 3rd and 4th year each. In this case,

$$PVR = 100 + \frac{100}{(1+5\%)^1} + \frac{100}{(1+5\%)^2} + \frac{100}{(1+5\%)^3}$$

$$PVR = 100 + \frac{100}{(1+0.05)^1} + \frac{100}{(1+0.05)^2} + \frac{100}{(1+0.05)^3}$$

$$PVR = 100 + 95.24 + 90.70 + 80.38$$

$$PVR = 372.32$$

Noted that the present value will be different depending on the discount rate.

There are some projects where there is perpetual return, i.e. return over the infinite period of time. Let, a project gives perpetual return of Rs.100. In this case PVR is

$$PVR = \frac{100}{(1+r)} + \frac{100}{(1+r)^2} + \frac{100}{(1+r)^3} + \frac{100}{(1+r)^4} + \dots$$

$$PVR = 100 \left[\frac{1}{(1+r)} + \frac{1}{(1+r)^2} + \frac{1}{(1+r)^3} + \frac{1}{(1+r)^4} + \dots \right]$$

$$\text{Let, } \frac{1}{(1+r)} = x$$

$$PVR = 100 [x + x^2 + x^3 + x^4 + \dots] \dots\dots\dots(1)$$

The sum of geometric product up to infinite ($x + x^2 + x^3 + x^4 + \dots$) is given by

$$S = \frac{a}{1-r}$$

Where, a is the first term and r is the common ratio.

$$S = \frac{a}{1-r} = \frac{x}{1-x} = \frac{\frac{1}{(1+r)}}{1-\frac{1}{(1+r)}} = \frac{\frac{1}{(1+r)}}{\frac{1+r-1}{(1+r)}} = \frac{\frac{1}{(1+r)}}{\frac{r}{(1+r)}} = \frac{1}{(1+r)} \cdot \frac{(1+r)}{r} = \frac{1}{r} \dots\dots\dots (2)$$

Substituting equation (2) in (1), we have

$$PVR = 100 \left(\frac{1}{r}\right)$$

Net Present Value

It is not necessary that the entire cost investment is done in the initial period. Sometimes cost of investment is also there for different years. In this case we have to calculate PVR as well as PVC. The difference between these two is known as net present value (NPV) of the investment project.

$$NPV = \text{Present value of return} - \text{Present Value of cost}$$

Net present value gives answer to two questions.

- (a) Does an investment project is to be undertaken?

Answer: Yes, if NPV is positive.

- (b) Given a number of projects, how to rank those projects?

Answer: Higher the NPV, the better the project is.

NPV assumes that there is no uncertainty regarding future return and cost. Further, there is no limit of funds that the investors can borrow.

Another measure of investment criterion is the profitability rate.

$$\text{Profitability rate} = \frac{PV \text{ Return}}{PV \text{ cost}}$$

If Profitability rate is greater than 1, it is profitable to invest, otherwise not

4.4 Internal Rate of Return

Internal rate of return (IRR) is the rate of discount (i), which makes net present value of an investment project equal to zero (NPV=0). In other words, it is the rate of discount which makes present value of future receipts of an investment project equal to the present value of cost of investment. If IRR is higher than the market rate of interest, then it is profitable to invest in a particular project and it gives the same result as that is given by net present value criterion.

Let there is an investment project, which initial investment is Rs.4000 crores. It gives return of Rs.5000 crores after one year. In this case internal rate of return is 25%. Because it is the discount rate which makes present value of future return (Rs.5000 crores) equal to the cost of initial investment.

$$\text{Present Value of Return} = \frac{5000}{(1+25\%)} = \frac{5000}{(1.25)} = 4000 \text{ crores}$$

Question: Let, there is an investment project, which costs Rs.100,000 in the initial period of investment. It gives return of Rs.48,000, Rs.43,200 and Rs.51,840, after completion of 1st, 2nd and 3rd year respectively. Market rate of interest is 14%. Examine, considering IRR whether the investment project is profitable or not.

Answer:

The present value of Cost = Rs.100,000

$$\text{Present Value of Return} = \frac{48,000}{(1+i)} + \frac{43,200}{(1+i)^2} + \frac{51,840}{(1+i)^3}$$

Here, the present value of return will be Rs.100,000 if the rate of discount (i) is 20%.

Given, the market rate of interest 14%, it is profitable to invest in that project as interest rate (r) < internal rate of return (i) or 14% < 20%.

4.5 Marginal Efficiency of Capital

Marginal efficiency of capital is the theory of investment given by Keynes. According to him, major portion of aggregate investment is done in durable capital asset, in case of which future earnings have very crucial effect on investment decisions. Expectations have a very dynamic role in deciding the investment behavior of business firms. In contrast with earlier theories of investment which was in ex-post term, Keynes approach was in ex-ante terms. In Keynesian analysis, the level of investment depends on two factors: Marginal efficiency of capital (MEC) and rate of interest (r). MEC is the highest rate of return over cost expected from an additional or marginal unit of capital asset. It may be regarded as the highest rate of return over cost expected from producing an additional unit of the most profitable of all categories of capital assets. If the income generating capacity of a capital asset is constant over its life time, then MEC (i) is:

$$i = \frac{Y}{P}$$

Where, i= MEC, Y= prospective Yield per unit of time, P= Supply price

- If Y=2000 and P= 10000, then

$$i = \frac{2000}{10000} \cdot 100 = 20\%$$

According to Keynes, it is the rate of discount that would make present value of a series of expected return of a

capital asset during its life time just equal to its supply price.

$$P = \frac{R1}{(1+i)} + \frac{R2}{(1+i)^2} + \frac{R3}{(1+i)^3} + \dots + \frac{Rn}{(1+i)^n}$$

Where, i is the MEC.

MEC is positively related to investment. Higher MEC means it is profitable to invest in that capital asset. While, rate of interest is inversely related to investment in capital asset. As long as MEC is greater than market rate of interest it is profitable to invest in that capital asset.

Marginal Efficiency of Investment (MEI):

MEI is a general form of marginal efficiency of capital. If certain fixed amount of investment is to be made in a particular investment project (rather than a particular capital asset), the MEI is the unique rate of discount which can equate the present value of the annuities to the cost of financing the project.

$$C = \frac{R1}{(1+d)} + \frac{R2}{(1+d)^2} + \frac{R3}{(1+d)^3} + \dots + \frac{Rn}{(1+d)^n}$$

Where, R₁, R₂R_n are the expected rate of return from an investment project.

C is the cost of the project. d is the rate of discount or MEI, that makes expected return equal to cost of investment. d varies directly with the volume of expected return. Given the expected return, d varies inversely with C. Investment projects are ranked on the basis of MEI (d), higher the d higher will be the rank of the project. It is profitable to invest in a project as long as d is higher than market rate of interest (r).

4.6 Theories of Business Cycle

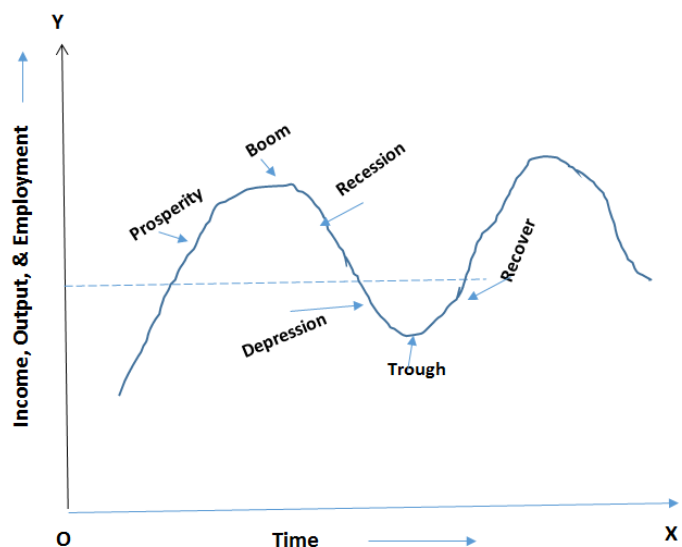
Before discussing the theories of business cycle, let's have an idea about the meaning of business cycle. Business cycle means the fluctuations in the economic activities like income, employment and output. The characteristics of business cycle are given below:

- (i) The fluctuation may start in one sector of the economy, but ultimately it affects each and every sector of the economy.
- (ii) Although business cycle affects all the sector of the economy, the impact is not similar. Some sectors are more affected and some are less.
- (iii) Once a business cycle starts in one direction, it keeps on moving in that direction. In other words, business cycle is cumulative in nature.
- (iv) The business cycles are recurrent. However, they are not periodic. The length of different business cycles is different.
- (v) In the globalized world, if business cycle starts in one country it is expanded to the other countries also. In that sense, it is international in nature.

Phases of Business Cycle:

- (a) **Prosperity:** During this stage, there is a continuous increase in income, employment and output. Note that the increase in these economic variables is real, not in monetary terms. All the factors of production are fully employed or the level of unemployment is very low. There is also an increase in wage, profit and price. However, price level has a tendency to increase at a faster rate than the wage rate. There is an increase in demand for bank loan and other financial services. There is also an increase in interest rate. Moreover, this state of the economy is characterized by optimism among the producers, investors and workers. This optimism may also be over optimism; which Keynes termed as error of optimism. The highest point of prosperity is known as the boom.
- (b) **Recession:** As there is more and more investment during prosperity, the down fall towards economic activities is inevitable after some time. Investors realise that investment is no more profitable. So, there is a decline in investment. The banks and other financial institutions are suffering due to deficit in reserves as they provide more and more loans during prosperity. They pressurize the investors to repay loans. The borrowers (producers/investors) try to sell their products as soon as possible; which leads to decline in price level and profit. It has an adverse effect on investment, employment, output and income.
- (c) **Depression:** If recession continues it leads to the situation of depression. Depression is a situation when the level real income, per capita production, and rate of employment falls substantially. There is overproduction and unemployment in the economy. At the same time there is also decline in wage rate and general price level. The price level falls because producers want to sell more, and consumers postpone their purchasing with the expectation that there will further decline in price. The decline in prices leads to decline in profit, which ultimately leads to further decline in investment, employment, and income. The lowest point of depression is known as trough. The depression badly affects the economic life of a country. However, depression also does not last for a longer time. After, sometime the economic activities start and recovery period starts.
- (d) **Recovery:** Recovery means the movement from the lowest point of depression (i.e. trough) towards prosperity. During this phase, the economic activities show a sign of improvement. There is a slow rise in the level of production, employment and

Figure 1 Phases of Business Cycle



output. In the early stages of recovery, price level remains more or less stable and real income increases along with increase in money wage rate. There is an increase in demand for goods and services, and investment becomes profitable. The investors invest more and financial institutions are also ready to advance loans. Noted that recovery is a slow process. To pull the economy out of depression there should be appropriate government policies.

4.7 Schumpeterian theory of Business Cycle

According to Joseph Schumpeter, the economic cycles are the inevitable outgrowth of economic progress in a capitalist society. The fluctuations are inherent in the economic processes of industrial change. According to Schumpeter, the fundamental cause of fluctuations is the periodic burst of innovational activities. Innovation is the changes in production function which cannot be decomposed into infinitesimal steps. Thus, innovation is the main cause of business cycle. Innovation may be of five types:

- (i) Introduction of a new product.
- (ii) Introduction of a new method of production.
- (iii) Introduction of a new market.
- (iv) Control over new source of inputs; which may be finished and semi-finished goods.
- (v) A new organizational setup.

Innovation is different from invention. Invention is the introduction of a new ideas, while innovation is the commercial exploitation of a new idea. Another difference between invention and innovation is that while the former is a continuous process, the latter is a discontinuous process. There are some causes behind the discontinuous nature of innovation:

- (a) There may be social opposition to innovation.
- (b) At the initial stage, the bankers are not sure about the commercial viability of the new idea or project. So, the banking system hesitate to finance the new product or the new system.
- (c) There may be difficulties in training workers in new techniques. The non-availability of trained labourer may also acts as a barrier to commercial exploitation of a new idea.

As long as the barriers exist, the process of innovation is greatly slowed down. Once these barriers are lifted, there will be clusters of innovations involving a burst of investment activities. This theory assumes that all the factors of production are fully employed. In other words, savings is equal to investment, and all the labourers are fully employed.

Different Phases of Business Cycle: Let's start with the equilibrium, where all the savings are invested, and there is no unemployment. There are only a few entrepreneurs who innovate and make investment with bank credit. While only a few can lead, there are many to follow them. The success of innovators will produce a swarm of imitators, who will emulate the successful innovators and earn profits. There will be more and more investment and installation of machineries. As saving is short fall of investment requirements, investment is done with bank

loan and banks provide loans with credit creation. Moreover, as there is full employment, investors have to pay higher wages in order to attract labour. It increases income of labourers which increases demand for goods and services. Increased demand for goods and services leads to increase in general price level. As a result, profit increases. Increased profit encourages the investors to invest more; which ultimately leads to further increase in employment, income and output.

The peak of expansion is characterized by the innovators ceasing to innovate. Here, most of the new techniques have already been established, the new markets have been penetrated, all the new products which were to be introduced have already made their appearance and no new force of imitation is left. There will be a state of over production. There will be competition among the producers to sell their products. It will lead to fall in price and profit. At this stage, banks realise that enough loans are already advanced, so they pressurize the borrowers to repay the loan. When Banks pressurize the producers to return their loan, it increases competition among the producers to sell their products. It results fall in price level. Decline in prices lead to decline in profit and investment. Decline in investment ultimately leads to decline in employment, income and output. It results in recession, i.e. continuous decline in income, employment and output. However, as marginal propensity to consume is less than 1, the decline in consumption will be less than that of income. After some time, new innovation will take place and the economy will move towards recovery and then to prosperity.

The greatest criticism against this theory is the assumption of full employment. In reality we don't have the situation of full employment; rather there is underemployment or unemployment situation. Some people say that innovation is not the sufficient condition for increase in income, employment or output. Other influences on cycles is not considered by this theory.

4.8 Keynesian theory of Business Cycle

Keynes, in his famous book 'The General Theory of Employment, Interest and Money' inserted a chapter titled Notes on Business Cycle. The objective of this chapter was to explain the factors causes fluctuations in income and employment. He did not have any intention to provide a theory of trade cycle. Economists state that Keynes' theory is more than a theory of business cycle and also less than a theory of business cycle. It is less than a theory of business cycle, as it does not explain different phases of business cycle in a systematic way. Again, it is more than a theory of business cycle, as it goes beyond the scope of the conventional theories of business cycle to explains the factors those affect the fluctuations in income, employment and output.

According to Keynes the fluctuations in income and employment is caused by the variation in the rate of investment. Investment is affected by marginal efficiency of capital (MEC), and MEC is determined by prospective yield. The fluctuation is further complicated by the changes induced by marginal propensity to consume and rate of interest. During the expansion phase, the outlook of the entrepreneurs' is optimistic. The confidence in future is quite firm and the marginal efficiency of capital is sufficiently high. The business activity continuously improves and new investment takes place. There is multiple increase in income, employment and output. Expansion goes on cumulatively. Towards the close of boom, excessive optimism of the entrepreneurs is strong enough to offset:

- (a) the tendency towards diminishing marginal returns due to the growing abundance of fixed capital asset.
- (b) The rising cost of capital asset.
- (c) A rise in the interest rate.

The continued excessive investment, according to Keynes is due to error of optimism. The continuing investment approaches progressively a point of capital saturation. Increased cost of capital, declining prospective yield, increased competition and increased stock of manufactured goods shows the actual situation to the investors. Consequently, extreme optimism gives way to pessimism. Investment declines and wide spread unemployment is there. The contraction accelerates due to: Rise in interest rate and the reverse working of the multiplier.

The rapid rise in interest rate is due to increase in liquidity preference. During this period no one want to purchase stocks; which is due to the expectations of further fall in security prices. Moreover, everyone wants to sell their stocks. Thus there is a decline in stock prices and increase in interest rate. Moreover, the businessmen need cash to fulfill their contractual payments such as rent or wage of the labourers. It also creases demand for cash and results increase in interest rate.

Moreover, there is reverse working of the multiplier. The multiplier during contraction works in a much more devastating way than during expansion. The multiplier is defined as:

$$K = \frac{1}{1-MPC} = \frac{1}{MPS}$$

During recession income get distributed against the richer section of the society or in favour of the low income class. The poor people have higher propensity to consume or lower propensity to save. As a result, the propensity to save of the society as a whole decline. The decline in MPS leads to increase in the value of multiplier. Thus, the decline in income is much higher than the decline in investment.

According to Keynes, the only way to move towards recovery is the restoration of confidence (optimism) among the investors. According to him, even zero interest rate is not sufficient to recover the economy. Unlike depression, the recovery is a very slow and halting process. The magnitude of normal rate of growth of the economy also affects the time needed for recovery. If normal rate of growth is higher, the recovery process is faster. Moreover, the time necessary for the wearing out and obsolescence of durable capital assets also affect the recovery period. If the life of the capital goods is longer, more time will take for their replacement. It will slow down the recovery process. Further, stock of finished or semi-finished goods are accumulated during prosperity. The time needs for the excess stocks to be fully absorb also affect the recovery period. Although rate of interest also plays a role in the recovery process, its role is secondary.

Criticisms against Keynesian theory:

1. Some economists say that the concept of MEC is vague and misleading.
2. Keynes' theory of business cycle is criticized as the new version of psychological theory of business cycle.

3. Keynes gave importance to the concept of multiplier and ignored the combine working of multiplier-acceleration.
4. Keynes states that there is regularity in the phases of business cycle; which is criticized by others.
5. Keynes' belief on cheap money policy to counteract depression has been criticized by some economists.

4.9 Multiplier Accelerator Theory of Business Cycle

The Keynesian theory of business cycle gave more and more emphasis on the functioning of multiplier effects of investment. The concept of multiplier explains the changes in income due to some changes in autonomous investment. In other words, multiplier effect explains the impact of investment on income. However, the story is not completed here. Because, the increase in income has positive impact on consumption expenditure. Increased consumption expenditure increases profit of the investors. And the increase in profit further induces investment. Thus investment increases income and income further increases investment. The increase in private investment (motivated by profit) due to increase in income (expenditure) is known as acceleration effect. Thus, to have a complete analysis of income determination both multiplier and accelerator effect is to be taken into account. Keynes ignored the acceleration effect of income determination. Latter, Paul A. Samuelson gave the concept of interaction between multiplier effect and accelerator to explain the fluctuation in income, employment and output. The impact of the combine working of the multiplier and accelerator can be explained as given below. The national income (Y) at time 't' consists of government expenditure (g_t), consumption expenditure (C_t) and induced private investment (I_t). Thus,

$$Y_t = g_t + C_t + I_t \dots\dots\dots (1)$$

The consumption in present period is the function of income of the previous period; i.e.

$$C_t = \alpha Y_{t-1} \dots\dots\dots (2)$$

In equation (2) α is the marginal propensity to consume. Further, induced private investment is the function of changes in consumption expenditure; i.e.

$$I_t = \beta (C_t - C_{t-1})$$

$$\text{Or, } I_t = \beta (\alpha Y_{t-1} - \alpha Y_{t-2})$$

$$\text{Or, } I_t = \alpha \beta Y_{t-1} - \alpha \beta Y_{t-2} \dots\dots\dots (3)$$

In equation (3) β is the accelerator coefficient. From equations (1), (2) and (3) we have:

$$Y_t = g_t + C_t + I_t$$

$$Y_t = g_t + \alpha Y_{t-1} + \alpha \beta Y_{t-1} - \alpha \beta Y_{t-2}$$

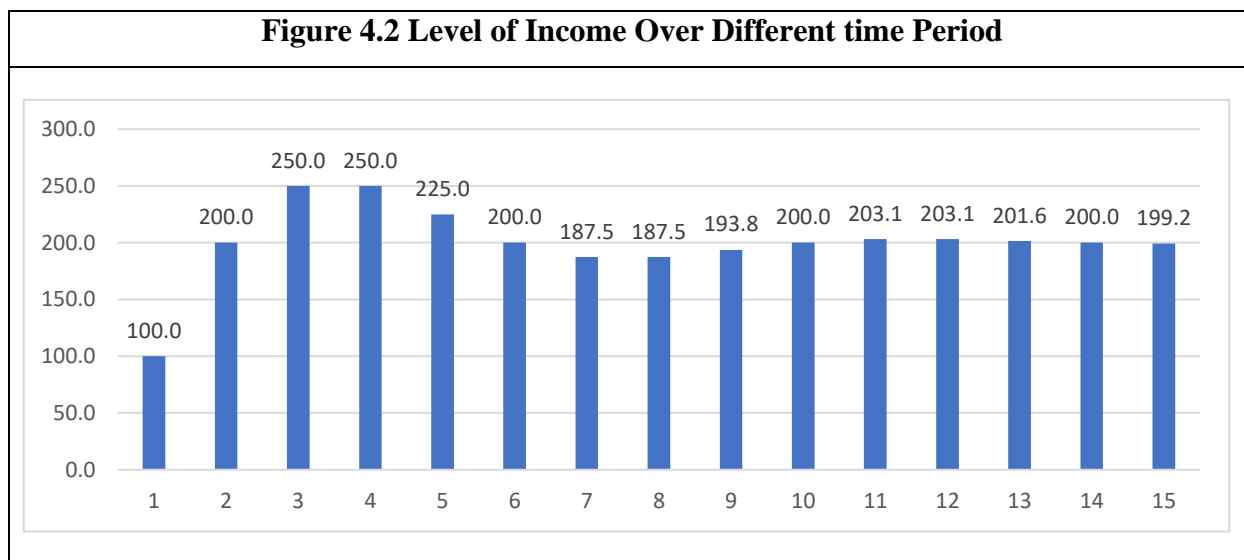
$$Y_t = g_t + \alpha (1+\beta) Y_{t-1} - \alpha \beta Y_{t-2} \dots\dots\dots (4)$$

Let's assume, the government (autonomous) expenditure at all the time (g_t) is 100. The value of marginal propensity to consume (α) is 0.5 and the acceleration coefficient i.e. change in private investment due to some change in consumption expenditure (β) is 1. With the information stated above, the changes in income over the period is shown in Table 4.3.

Table 4.3. Changes in National Income Over the Period

Time Period	Current Government Expenditure	Current Consumption	Current Private Investment	National Income
1	100.00	0.00	0.00	100.00
2	100.00	50.00	50.00	200.00
3	100.00	100.00	50.00	250.00
4	100.00	125.00	25.00	250.00
5	100.00	125.00	0.00	225.00
6	100.00	112.50	-12.50	200.00
7	100.00	100.00	-12.50	187.50
8	100.00	93.75	-6.25	187.50
9	100.00	93.75	0.00	193.75
10	100.00	96.88	3.13	200.00
11	100.00	100.00	3.13	203.13
12	100.00	101.56	1.56	203.13
13	100.00	101.56	0.00	201.56
14	100.00	100.78	-0.78	200.00
15	100.00	100.00	-0.78	199.22

Figure 4.2 Level of Income Over Different time Period



From Table 4.3 it can be seen that given the value of marginal propensity to consume (0.5) and accelerator coefficient (1), the income increases up to third period. It remains constant in the fourth period. Then, it continues to decline up to 7th period. Income further starts to increase in the 9th period and continue up to 11th period. Then, again it declines. The fluctuation in income can be seen from Figure 4.2. Noted that the pattern of fluctuation in income depends on the magnitude of marginal propensity to consume (α) and acceleration coefficient (β).

Criticisms: However, Samuelson's theory of business cycle is also not free from criticisms. Some of the criticisms are:

1. This theory is based on crude and mechanical concept of multiplier and accelerator. So, it is criticized to be too mechanical.
2. It assumes constant values of α and β coefficients, which is not true in reality.
3. It does not say about the periodicity of business cycles.
4. Fluctuations are assumed to take place around a constant equilibrium path, which is not true.
5. It fails to integrate theory of business cycle with economic growth.
6. No ceiling or floor limits are prescribed for fluctuations.
7. This theory overlooks the effects of monetary changes upon cyclical fluctuations.
8. It does not consider the effects of expectations upon business cycle.
9. It is based on the assumption of closed economy.

Let us Sum up

In this chapter, we have learnt the following points:

- (i) Payback period is the time needed for the recovery of the initial investment made in a project.
- (ii) According to net present value criteria of investment, it is profitable to invest in a project if net present value of that project is greater than 0.
- (iii) Internal rate of return is the discount rate which makes net present value of an investment project equal to 0. It is profitable to invest in an investment project, if internal rate of return is greater than the market rate of interest.
- (iv) According to Keynesian theory of investment, it is profitable to invest in a project as long as marginal efficiency of investment is greater than the market rate of interest.
- (v) Schumpeter's theory of business cycle assumes that innovation is the main cause behind the fluctuation in income, output and employment.
- (vi) In Keynes' theory of business cycle expected return from investment play the major role.
- (vii) Samuelson explains the fluctuation in income, employment and output with the concept of the interaction between multiplier and accelerator principle.

Key terms

Marginal efficiency of capital, rate of interest, internal rate of return, present value, pay back, business cycle, multiplier, innovation and multiplier accelerator interaction.

Short Questions

- (1) Define payback period.
- (2) What is meant by marginal efficiency of capital?
- (3) Define profitability rate.
- (4) What is discount rate.
- (5) What are the limitations of payback period as an investment criterion?
- (6) Define internal rate of return.
- (7) What is error of optimism?
- (8) What are the different types of innovations?
- (9) What is the difference between invention and innovation?

Long Questions

1. Critically discuss Keynesian theory of business cycle.
2. Explain, the multiplier-accelerator theory of business cycle.
3. Discuss the innovation theory of business cycle.
4. Explain, the net present value criterion of investment.
5. Discuss Keynes' theory of investment.
6. Critically discuss payback period criterion of investment. Define discounted payback period.

Suggested Readings

1. Branson, W. H. 2016: *Macroeconomic Theory and Policy* (Third Edition), East-West Press.
2. Rana and Verma 2014: *Macro Economic Analysis*, Vishal Publications.
3. Shapiro, Edward 2013: *Macroeconomic Analysis*, Thomson Learning.

UNIT 5 THEORIES OF TRADE CYCLE

Structure

- 5.0 Introduction
- 5.1 Unit Objectives
- 5.2 Schumpeterian Theory
- 5.3 Multiplier-Acceleration Interaction
- 5.4 Kaldor's Theory
- 5.5 Monetary and Fiscal Policy for Economic Stabilization
- 5.6 Summary
- 5.7 Key Terms
- 5.8 Answers to 'Check Your Progress'
- 5.9 Questions and Exercises
- 5.10 Further Reading

NOTES

5.0 INTRODUCTION

Trade or business cycles are those fluctuations which recur in aggregate economic activities with a certain degree of regularity following the pendulum like oscillations. According to Wesley Clair Mitchell, who did some pioneering work in this field, 'business cycles are a type of fluctuations found in the aggregate economic activity of nations that organize their work mainly in business enterprises. A cycle consists of expansions occurring at about the same time in many economic activities followed by similarly general recessions, contractions and revivals which merge with the expansion phase of the next cycle, this sequence of change is recurrent but not periodic.' This definition reveals that business cycles are fluctuations in the aggregate economic activity and, therefore, are concerned with the economy as a whole. Apart from this feature, business cycles are confined to only those fluctuations which recur with regularity.

In this unit, different trade cycle theories, particularly Schumpeterian theory, Multiplier-acceleration theory and Kaldor's theory have been explained in detail.

5.1 UNIT OBJECTIVES

After going through this unit, you will be able to:

- Discuss the innovations theory of trade cycle associated with Schumpeter
- Analyse the multiple-accelerator interaction and the principle behind it
- Describe the investment-consumption function according to Kaldor's theory
- Analyse the process of the re-emergence of monetary policy
- Discuss the various instruments of monetary policy

5.2 SCHUMPETERIAN THEORY

NOTES

The innovations theory of trade cycle, associated with the name of well-known economist Joseph A. Schumpeter, makes innovations the central cause of the recurrence of business cycle in the modern industrial economies. According to Schumpeter, the key to the explanation of the trade cycle lies in the recurring bursts of innovational investment activity which dominates the capitalist economies. Schumpeter views the business cycle as a natural outgrowth of economic progress. As Schumpeter puts it:

‘The booms consist in the carrying out of innovations in the industrial and commercial organism. By innovations I understand such changes of the combinations of the factors of production as cannot be affected by infinitesimal steps of variations on the margin. They consist primarily in changes in methods of production and transportation, or in changes in industrial organization, or in the production of a new article, or in the opening of new markets or of new sources of material. The recurring periods of prosperity of the cyclical movements are the form progress takes in capitalistic society.’¹

According to Schumpeter, innovations are lumpy and bunched in time leading to the corresponding surge of investment outlay necessary for their commercial exploitation. The lumpy and surging investment activity is sufficient to create conditions of boom in the economic activity. According to Schumpeter, an innovation is different from an invention.

An innovation is the initial application of an invention to commercial production while an invention is the discovery or development of a new process, product or service by scientists or engineers. Despite the fact that inventions may appear more or less continuously through time, innovations—initial commercial exploitation of inventions—show marked discontinuities because a majority of the businessmen being risk avoiders are reluctant to innovate at all under ordinary circumstances. An innovator is one who is the first to make the commercial application of invention and consequently bears the risks involved in introducing a new product or service or process in the market. The success or failure of an innovation can only be proved by actually producing and marketing the new product. This virtually amounts to groping in the dark, inviting avoidable risks which most firms would choose to avoid preferring to produce and market only the old and tried goods and services produced through the traditional processes and methods. The majority of firms are simply the imitators.

According to Schumpeter, the innovators, formally designated as entrepreneurs, play a leading role in the entire process of capitalistic evolution. They comprise the microscopic group of dashing pioneering members of the business community who are constantly on the look-out for something new and different. They translate inventions into innovations relying largely on their business acumen and believing that success will be theirs. When the innovation proves successful extraordinary profits accrue to the innovators. But very soon the innovation is imitated by others by adopting new processes of production and producing and marketing the goods and services similar to those produced and marketed by the innovators. Others imitate the innovator because they cannot allow themselves to be brow-beaten by an aggressive rival. As more firms imitate, the pressure on those not imitating increases. Moreover, the innovation, especially when it comes about at a time when the economy is operating at the near-full or full employment level, causes a rise in prices because entrepreneurs compete in bidding for the available supply of resources. Profit opportunities appear brighter and investment is stimulated. A surge of investment activity grips the economy. However, as an increasing swarm of

imitators expand their investment activity, cut-throat competition results in bringing down perceptibly the profits of the innovator. Although we started off here with one innovation and one industry, the fact is that several other innovations are being simultaneously exploited in the economy. For some time, the business activity continues to expand as the innovators reap the increasingly rich harvest of extraordinary profits under the impact of increasing commercial application of inventions. As each successful innovator creates a swarm of imitators and as the expanding business activity reinforces the prospects for further success of still other innovations, the economy moves into a period of expansion characterized by a bunching of innovations and rapid growth in investment spending which accompanies the innovation process.

But what causes this expanding investment activity to come to an end? The expansion comes to an end as the process of introducing innovations in the economy comes to an end for the time being. The prosperity was spurred by investment activity caused by innovations. The innovation opportunities are not, however, limitless. Consequently, after some time the opportunities for investment in the new spheres decline. For each innovation taking the form of production of some new product or service it is just a matter of time until the new factories needed to produce these goods are constructed. When this has happened, the innovational net advantage disappears. In short, investment outlays in general whether incurred to produce the new goods or services, reduce costs, open new markets or develop new sources of supply, eventually will have been made and the actual capital stock will correspond to the desired capital stock in the economy. When this situation is reached, all those innovations deemed worthwhile by the entrepreneurs have been adopted. The boom comes to an end because the new investment outlays generated by the innovations slow down to a trickle.

The upswing turns into a downswing as the impact of the maladjustments which were built into the system during the process of innovational activity begin to manifest themselves. According to Schumpeter, innovational activity is 'lopsided, discontinuous, disharmonious by nature the disharmony is inherent in the very *modus operandi* of the factors of progress.'² Being unbalanced, the prosperity cannot be sustained and 'depression is nothing more than the economic system's reactions to the boom or the adaptation to the situation into which the boom brings the system.'³

The lower turning point of trade cycle, i.e., recovery occurs when following a period of readjustment to the changed economic circumstances created by the previous boom, prices have fallen to a point where the pioneering businessmen, entertaining the hope that any further fall is most unlikely to happen, once again start innovating. The introduction of innovation heralds the beginning of the recovery which soon leads to rapid expansion of the economy.

In Schumpeter's trade cycle theory, *first*, the innovators are assumed to appear in a cluster causing the process of economic development to proceed discontinuously rather than in a smooth continuous manner. *Second*, the assumption is that the majority, if not all, of the innovations are bank-financed by way of credit expansion.⁴ *Third*, special significance attaches to equilibrium because different phases of trade cycle are viewed as deviations of the economy from the equilibrium path. According to Schumpeter, trade cycles of different lengths occur simultaneously reacting upon one another. Although these different length trade cycles are caused by one and the same cause, namely innovations, the difference in their lengths is due to the fact that 'the periods of gestation and of absorption of effects by the economic system will not, in general, be equal for all the innovations that are undertaken at any time.'⁵

NOTES

Criticism: The innovations theory of trade cycle suffers from several weaknesses. The depth of the depression is not entirely determined by the disturbances caused by the innovations; it is also attributable to other factors which vary in intensity from one trade cycle to another.

NOTES

1. The extent to which innovations are introduced before the previous trade cycle has run out its course and before readjustments to the previous cycle have been made, significantly affect the depth and behaviour of trade cycle. Thus, if the innovations are made in the depression phase of the previous cycle, many firms that are doomed to liquidation get a fresh lease of life. Consequent upon the introduction of innovations, prices are prevented from falling. The shift of labour from one industry to another needed for the equilibrium adjustment remains incomplete. For these reasons, the early appearance of a new period of prosperity apart from involving its own maladjustments also carries some maladjustments to the next period of depression.
2. The amount of bank credit created during the prosperity also affects the nature and course of the business cycle. The greater the amount of bank credit absorbed in the system of financing innovations by the old industry, the higher will be the rise in prices. Consequently, the greater will be the readjustment needed to bring the prices into equilibrium. Further, greater the extent of speculative over-buying financed by the bank credit, greater will be the likelihood of the bank failures and financial crisis.
3. The nature of the competitive impact of innovations is also very significant in determining the magnitude of the trade cycle. If the impact of demand for the new product is reflected in a small decrease in the demand for all other products in general, the loss of demand felt by each one of the old industry will be comparatively mild and readjustment will be easily accomplished. On the contrary, if the competitive impact of the new product is limited to only a few old industries, a large number of firms in these industries will go out of production leading to mass unemployment and severe depression in the economy.
4. If the industries suffering from the competitive impact of the new product are highly localized, the unemployment of labour and other factors of production due to immobility will be far more severe than if the industries were widely dispersed in the country or the world.
5. The period required for the construction of factories for innovations to be carried through is also important in determining the duration and magnitude of the trade cycle. Longer the period required by the innovation to be carried through, more violent is the necessary readjustment. If the capital equipment for new innovations can be manufactured quickly, the new products by becoming available for sale in the market quickly will cause readjustments to take place before the development of extreme maladjustments. On the contrary, when the capital equipment involves a long gestation period for construction (e.g., railways), the entire economy becomes adjusted to the temporary demands of the construction period. At the end of the long period of construction when shifts in the demand take place, a far greater and far more severe readjustment becomes necessary.
6. The theory assumes that resources in the economy are fully employed and the innovations are entirely financed by means of the bank credit. In an economy with vast unemployed reserves of labour and other factors of production, the introduction of an innovation will not cause the withdrawal of labour and other

resources from the old industries. Consequently, the supply of old goods will not fall. Nor will the costs of old goods and services increase under the competitive impact of an innovation. Similarly, when the innovation is financed through real savings, there will be no inflationary price rise. Consequently, in an underemployed economy, innovations financed through real savings may not initiate or generate a trade cycle. Since full employment is an exception rather than a rule and since most innovations are self-financed by the firms by drawing on their development cash reserves, the innovations theory is at best an inadequate explanation of the trade cycle in a modern business economy. Friedrich A von Hayek is correct in holding that innovations alone cannot explain the phenomenon of business cycles without a substantive monetary explanation.

5.3 MULTIPLIER-ACCELERATOR INTERACTION

The acceleration principle explains that the net investment I_t during any given time period t depends upon the value of the accelerator v and the change in income in time period t , i.e.,

$$I_t = v\Delta Y_t = v(Y_t - Y_{t-1})$$

Assuming a change in the aggregate income Y , the net investment I_t in any given time period t will differ from investment I_{t-1} of the immediately preceding time period $t-1$ as indicated by the acceleration principle. However, an increase or decrease in investment will affect the aggregate income Y in the succeeding time periods as indicated by the multiplier principle. But any change in income from one time period to the next will in turn affect the net investment due to the operation of the accelerator which in turn will affect the income due to the action of the multiplier and so on. This process may continue endlessly due to the interaction between the multiplier and accelerator.

In Samuelson's model, interaction between the multiplier and the accelerator is an endogenous force which generates business cycle in the economy. Following Samuelson, national income Y_t in any given time period t can be written as the sum of the autonomously determined government expenditure G_t , consumption expenditure C_t , and private induced investment I_t . Thus,

$$Y_t = G_t + C_t + I_t$$

$$C_t = bY_{t-1}$$

$$I_t = v(C_t - C_{t-1})$$

On substituting for C_t and I_t , the equilibrium national income can be rewritten as:

$$Y_t = G_t + bY_{t-1} + v(C_t - C_{t-1})$$

$$Y_t = G_t + bY_{t-1} + bv(Y_{t-1} - Y_{t-2})$$

This equation states that the aggregate income Y_t in time period t is the sum of the autonomous government expenditure G_t , consumption expenditure C_t which depends on the marginal propensity to consume b and the income of the preceding time period Y_{t-1} and the investment outlay which depends on the capital-output ratio or the accelerator v and the change in consumption $\Delta C_t (= C_t - C_{t-1})$ in time period t . In other words, given the values for b and v , if the autonomous government expenditure in any given time

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Check Your Progress

1. Why is the period required for the construction of factories for innovations considered important?
2. Who is an innovator?

period t and the amount of consumption in time period t and the preceding time period $t - 1$ are known we can determine the equilibrium income Y_t for that time period by substituting the values of v and b in the above equilibrium equation.

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Although in the original multiplier-accelerator model of the trade cycle developed by Samuelson, investment has been related to the change in consumption, however, Hicks' version of this model in which investment is related to the change in income, has become more common.⁶ We shall discuss here Hicks' version in which—

$$C_t = bY_{t-1}$$

$$I_t = v(Y_{t-1} - Y_{t-2})$$

$$Y_t = C_t + I_t + G_t$$

Fluctuations in the aggregate income Y around its equilibrium value after an initial exogenous shock might be of the nature as shown in Figure 5.1. The shape of the time path of income Y will depend on the arithmetical values of b and v . In general, higher the value of v , greater is the possibility of an explosive time path of the aggregate income Y ; higher the value of b , smaller is the possibility that oscillations will occur. The following analysis is based on the assumption that b is constant and less than one and v is greater than zero, i.e., $0 < \bar{b} < 1$ and $v > 0$.

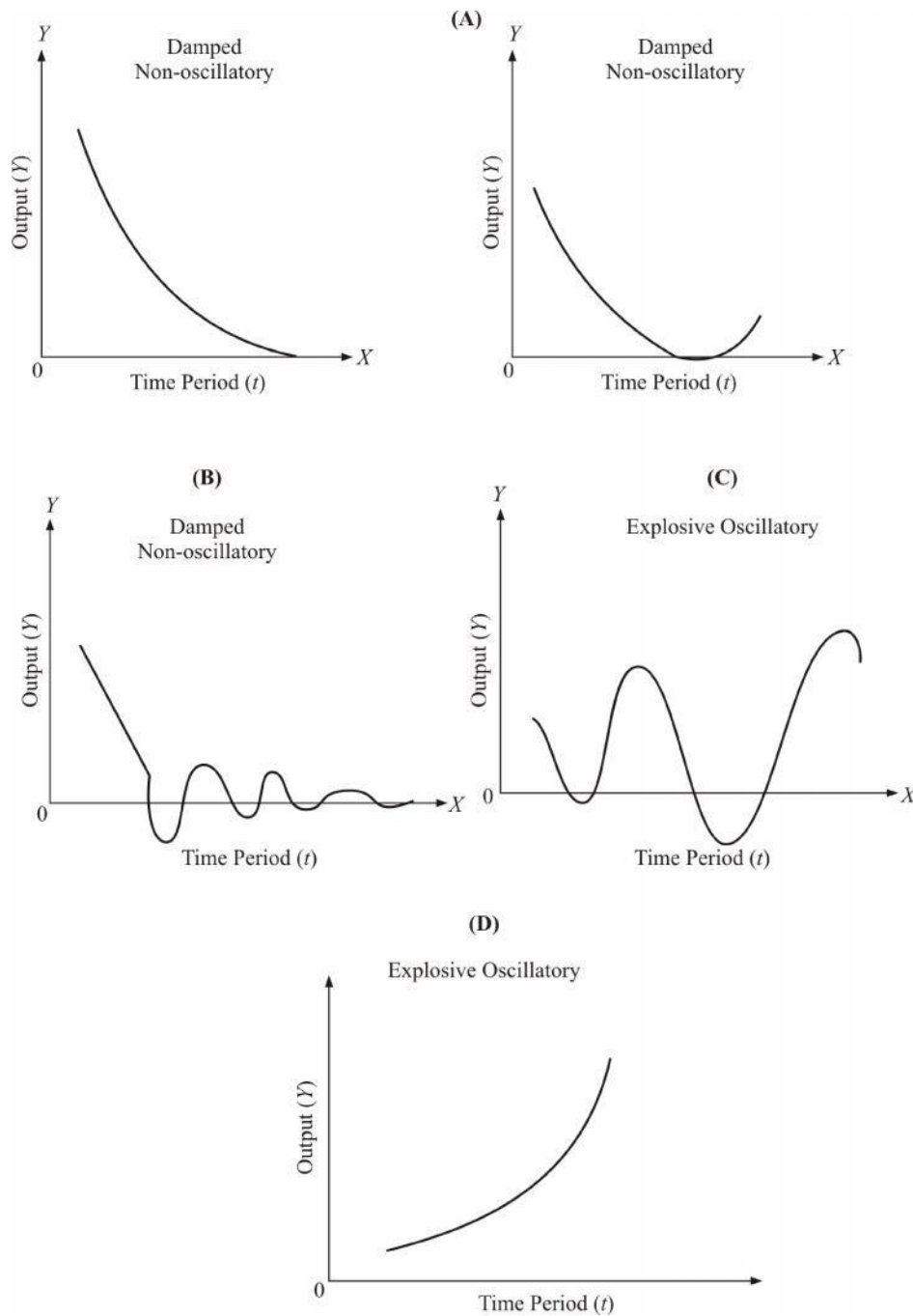
In this model, no trade cycle can be generated without an accelerator relationship and with only the first order lag. In other words, an accelerator and a second-order lag are both needed to generate a trade cycle. The multiplier itself is not needed to cause the trade cycle. In fact, as the value of b increases, the possibility of generation of the trade cycle is diminished. The model can be expressed through the following equations:

$$I_t = v(Y_{t-1} - Y_{t-2})$$

$$Y_t = C_t + I_t + G_t$$

The above model will generate a trade cycle for any value of v ranging between 0 and 5. But with the inclusion of the multiplier this simple model becomes more realistic and causes the trade cycles to occur which are similar to those that occur in the economy.

With or without a consumption function, two time periods after an initial increase in the exogenous variable—increase in the autonomous government expenditure—has raised the level of income Y ; the negative term $v Y_{t-2}$ will exert a negative effect on investment. Unless the accelerator is very strong or the marginal propensity to consume is very close to one, this will result in a slight decrease in investment and a slackening of the rate of increase in income. This will ordinarily be sufficient to cause a fall in investment (I) and in the rate of increase in income (ΔY). Soon a turning point is reached and ΔY becomes negative. When this happens, the forces of reversal start to operate. The low value of Y tends to reduce the negative effect of the term $v Y_{t-2}$ on investment with the result that investment ceases to fall rapidly. When this happens, ΔK increases and with it I also increases. Consequently, the economy begins to move upward. This process will be repeated until the economy either reaches a new equilibrium or continues to fluctuate so widely that the negative values of Y are reached. Such explosive cycles are not, however, likely to occur in the real world as the system always tends to return to equilibrium. Table 5.1 shows that with different combinations of the values chosen for b and v , the interaction of the multiplier and accelerator generates different patterns of income oscillations.

**Fig. 5.1**

Different possible combinations of b with values ranging between zero and 1 and of v with values ranging between zero and 5 will generate four different income patterns as shown in Figure 5.2. Those combinations of b and v which fall in the area labelled A in the figure will generate damped non-oscillatory income movements such as those shown in Figure 5.1(A). Similarly, region B shows those different possible combinations of the values of b and v which produce damped oscillatory movements in income as shown in Figure 5.1(B). Region C in Figure 5.2 shows those combinations of b and v which produce explosive oscillatory movements in income like the one shown in Figure 5.1(C). Region D shows those different combinations of b and v which will produce explosive non-oscillatory movements in income as shown in Figure 5.1(D).

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Table 5.1 Interaction of multiplier and accelerator¹

Time Period	A Damped; No Oscillations $b = 0.5; v = 0.05$				B Damped Oscillations $b = 0.5; v = 0.8$				C Explosive Oscillations $b = 0.5; v = 1.5$				D Explosive; No Oscillations $b = 0.5; v = 3.0$							
	C	+	I	+ G = Y	C	+	I	+ G = Y	C	+	I	+ G = Y	C	+	I	+ G = Y				
t-2	50		0	50	100	50		0	50	100	50		0	50	100	50		0	50	100
t-1	50		0	50	100	50		0	50	100	50		0	50	100	50		0	50	100
t	0		60	110	50	0		60	110	50	0		60	110	50	0		0	60	110
t+1	55		0.5	60	115.5	55		8.0	60	123	55		15	60	130	55		30	60	145
t+2	57.7		0.3	60	118.0	61.5		10.4	60	132	65		30	60	155	72.5		105	60	237.7
t+3	59.0		0.1	60	119.1	66		7.2	60	133.2	77.5		37.5	60	175	118.8		227.5	60	456.3
t+4	59.5		0.1	60	119.6	66.6		1	60	127.6	87.5		30.0	60	177.5	228.2		656.4	60	944.6
t+5	59.8		0	60	119.8	63.8		-4.5	60	119.3	88.8		3.7	60	152.5	472.3		1465	60	1,997.3
t+6	59.9		0	60	119.9	59.7		-6.6	60	113	76.2		-37.5	60	98.7					
t+7	60.0		0	60	120.0	56.5		-5	60	111.5	49.4		-89.7	60	28.7					
t+8						55.8		-1.2	60	114.6	14.4		-100.0	60	-30.6					
t+9						57.3		-2.5	60	119.8	15.3		-89.0	60	-44.3					
t+10						59.9		4.2	60	124	22.2		-20.6	60	17.2					
t+11						62		3.4	60	125.4	8.6		92.2	60	160.8					
t-12						62.7		1.4	60	123.8	80.4		215.4	60	355.8					
t-13						61.9		-1.3	60	120.6	178		292.5	60	530.5					
Y_{eq}	60		0	60	120.0	60		0.0	60	120.0	—		—	—	—					

¹ Figures in the table have been reproduced from Michael K Evans, book entitled, *Macroeconomic Activity*, 1969, p. 365.

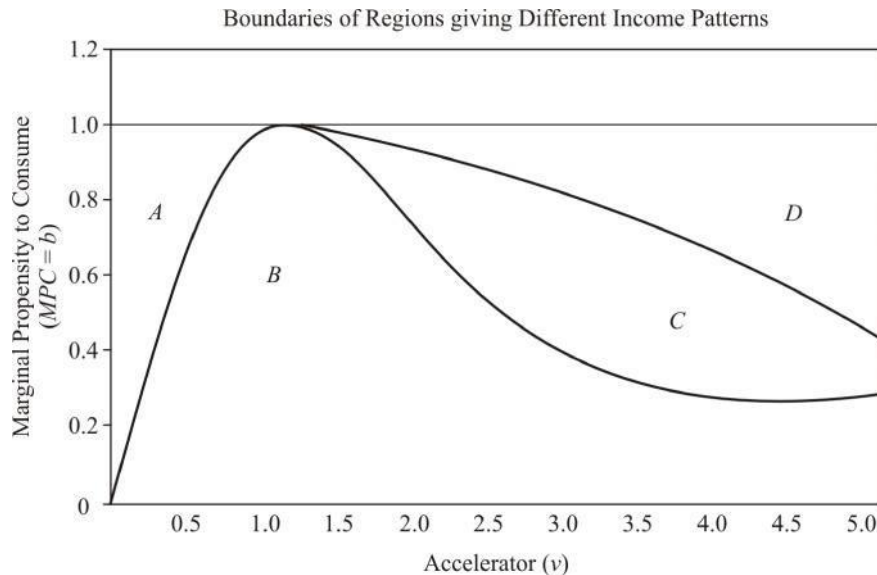


Fig. 5.2

The basic criticism of this model is the weaknesses of the rigid acceleration principle. Since the naive acceleration principle is unacceptable, the multiplier-accelerator interaction which incorporates the acceleration principle is also unacceptable as a perfect explanation of the occurrence of the trade cycle. James S Duesenberry has correctly stated that although ‘the basic concept of multiplier-acceleration is an important one but we cannot really expect to explain observed cycles by a mechanical application of that concept.’⁷

5.4 KALDOR’S THEORY⁸

In the model of the trade cycle developed by Nicholas Kaldor, consumption (or saving) is a function of income while investment is directly related to income and inversely related to the stock of capital. In other words, the investment demand function is of the capital adjustment type. Kaldor’s theory of trade cycle appeared in 1940, barely 4 years after the publication of Keynes’ book *The General Theory of Employment, Interest and Money*. Although Keynes devoted Chapter 22 of the *General Theory* to ‘Notes on the Trade Cycle,’ he did not develop any full-fledged theory of the trade cycle because his chief concern was to develop an alternative theory of income and employment which could replace the classical theory. Kaldor’s theory is a very simple and neat discussion of the trade cycle based on the Keynesian saving investment analysis.

Kaldor’s trade cycle theory is simply an extension of the income determination model where the saving-supply function was of the form $S = -a + sY$ and the investment-demand function was of the form $I = \bar{I}_A + eY$. The stability condition requires that the marginal propensity to invest (MPI) should be less than the marginal propensity to save (MPS), i.e., $MPI < MPS$. In other words, the slope of the investment demand function should be less than the slope of the saving supply function. This means that for the stability of equilibrium, the investment demand function must intersect the saving supply function from above. If the $MPI > MPS$, i.e., if the investment demand function intersects the saving supply function from below, the resulting equilibrium will be unstable.

In Figure 5.3, the saving supply and investment demand functions are linear. From the point of view of trade cycle theory, these offer very little as in either case—stable or

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Check Your Progress

3. State the principle of acceleration.
4. State one limitation of multiplier-accelerator interaction.

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unstable equilibrium—trade cycle will not occur while in the real world cyclical fluctuations have certainly occurred. For his business cycle analysis, Kaldor takes the non-linear saving and investment functions. According to Kaldor, the saving supply and the investment demand functions cannot both be linear over the entire range of changes in the income which take place during the course of a business cycle.

Dividing the full trade cycle into relatively low, normal and relatively high income phases, the marginal propensity to invest will not be the same during all the three phases. The linear investment demand function, however, makes us believe that it will be uniform. During the course of business cycle, the non-linear investment demand function will behave in such a way that the MPI or the slope of the investment demand function will be relatively low at both relatively low and relatively high levels of income. To express differently, the investment demand function is likely to be income-inelastic at low income levels due to the presence of excess plant capacity in the economy. It is also likely to be so at very high levels of income due to the high construction costs and the high cost and increasing difficulty of borrowing the funds.

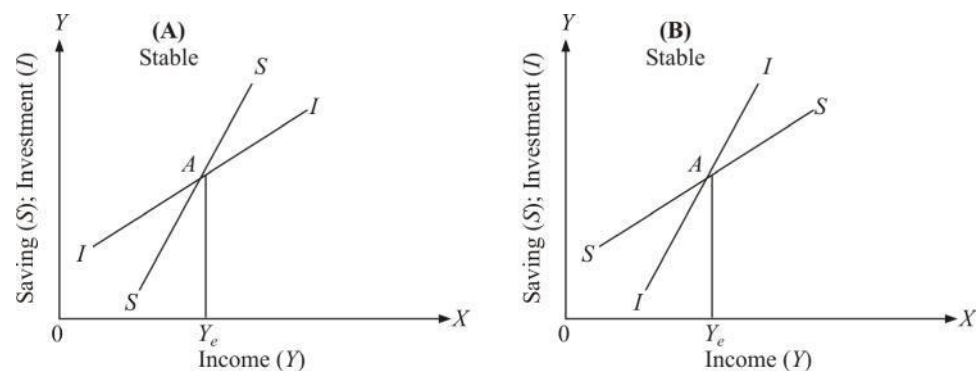


Fig. 5.3

According to Kaldor, the non-linear investment demand function has the shape as shown in Figure 5.4(A). Like the investment demand function, the saving supply function is also non-linear with the MPS varying corresponding to different income ranges. Thus, during the course of the trade cycle both for the relatively low and relatively high levels of income the MPS and therefore, the slope of the saving supply function will be high. Figure 5.4(B) shows such a saving supply function. In other words, the saving supply function is income-elastic at both very low and very high levels of income. The saving supply function behaves so because when income is very low, people try to maintain their former high standard of living to which they are accustomed with the result that a further fall in their income is accompanied by almost the full amount of fall in savings. When the income is very high, further increases in the income are accompanied by a very large proportional increase in savings because people expect these high levels of income to be transitory. Consequently, they do not increase their consumption at all or at any rate increase it very insignificantly. Thus, the saving supply function has a steep slope, both at relatively low and at relatively high levels of income.

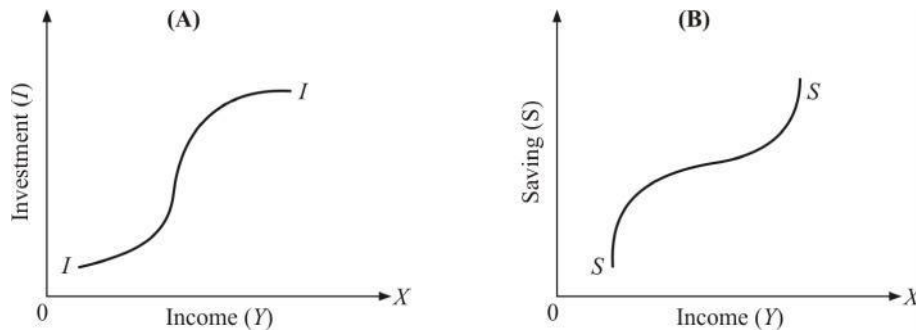


Fig. 5.4

By combining the investment demand and saving supply functions of Figure 5.4(A) and Figure 5.4(B) into a single diagram as shown in Figure 5.5, we obtain multiple equilibriums—both stable and unstable. At the equilibrium points A and B , the slope of the saving supply function is higher than the slope of the investment demand function. Consequently, the marginal propensity to save is higher than the marginal propensity to invest, i.e., $MPS > MP1$. Accordingly, the equilibrium points A and B which correspond to relatively low and relatively high levels of national income are the points of stable equilibrium and Y_A and Y_B are stable income levels. Below Y_A income and between the Y_B and Y_C levels of income, investment is more than saving, i.e., $I > S$. Consequently, income rises until it reaches the Y_A or Y_C level of income. At income levels ranging between Y_A and Y_B or above the Y_C levels of income, saving exceeds investment, i.e., $S > I$. Consequently, income falls until it reaches the Y_A or Y_B level of income. C is the point of unstable equilibrium. Consequently, the corresponding income Y_B is the unstable income. If income is between Y_C and Y_B , it will rise to Y_C and if it is between Y_B and Y_A , it will fall to Y_A . In other words, if the level of income is disturbed even slightly from Y_B , it will never tend back to Y_B . Moving farther away from Y_B , it will move either toward Y_C or toward Y_A stabilizing itself at either of these two stable income levels depending upon the direction of disturbance. The economy will attain stability only either at some particular high level of income, such as Y_C or at some particular low level of income, such as Y_A .

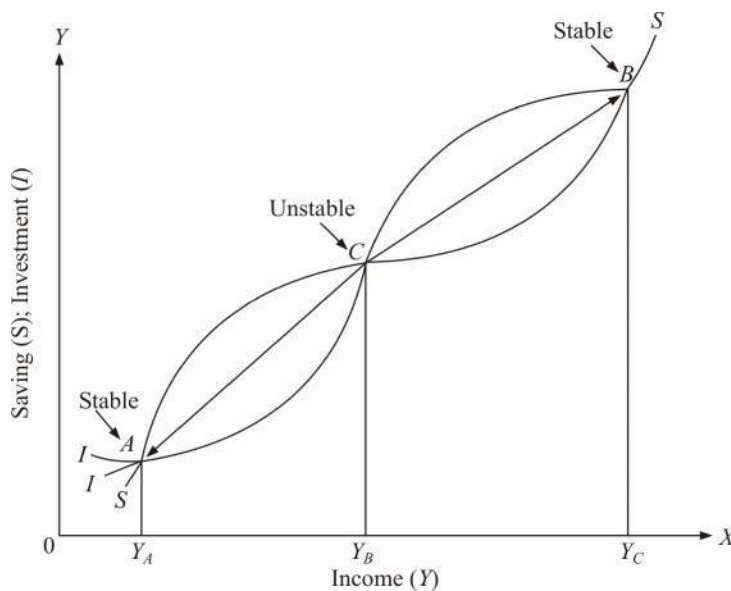


Fig. 5.5

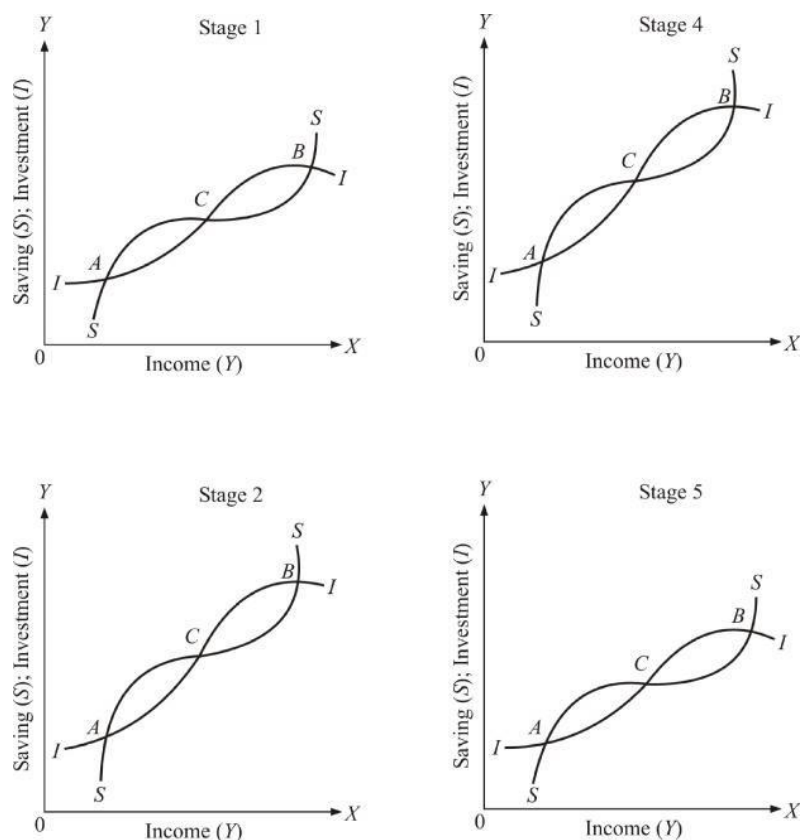
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Figure 5.5 does not, however, explain anything about the occurrence of the trade cycle composed of the alternating contractions and expansions. It shows nothing more than the two positions of stable equilibrium towards either of which the income will tend to move. According to Kaldor, ‘the key to the explanation of the trade cycle is to be found in the fact that each of these two positions is stable only *in the short period*, that as activity continues at either one of these levels, forces gradually accumulate which sooner or later will render that particular position unstable.’⁹ If we can show that stable equilibrium at *B* becomes unstable over time forcing a movement towards *A* and *vice versa* we can move ahead to show the generation of the trade cycle.

Figure 5.5 shows that both saving and investment vary as income changes during the course of trade cycle. However, apart from income, investment and saving are also affected by another factor. According to Kaldor, the capital stock in the economy also causes cyclical changes in saving and investment. Saving is a direct function of the capital stock such that higher the capital stock, higher is the amount of saving and *vice versa*. Investment is an inverse function of the capital stock such that for any level of income higher is the capital stock, smaller is the amount of investment and *vice versa*.

According to Kaldor, the investment and saving curves drawn in Figure 5.5 are short-run curves which shift over time. At high levels of income, investment will increase more rapidly. Consequently, the economy’s capital stock will continue to grow. After sometime, however, additions to capital stock will cause a downward shift in the investment demand curve. The saving supply curve will shift upward at high levels of income over time. This statement is similar to the view held by the under-consumptionists. This saving supply curve will shift upward at high levels of income because purchases of consumer durables will not increase as income increases.¹⁰ Figure 5.5 shows changes in the equilibrium position as the capital stock of the economy changes over time.



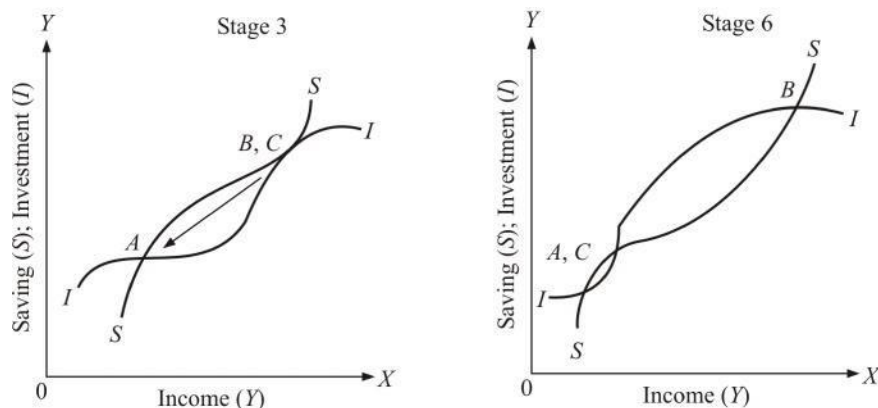


Fig. 5.6

In Figure 5.5, Stage 1 corresponds to Figure 5.5. We assume, to begin with, that the economy is initially in equilibrium at point *B* at relatively high or above normal level of income. Corresponding to this high level of equilibrium income, investment is correspondingly high. Higher the rate of investment, more rapid is the increase in an economy's total capital stock. As the capital stock grows, *ceteris paribus*, the marginal efficiency of capital falls causing a downward shift in the marginal efficiency of investment schedule which in terms of Figure 5.6 means a downward shift in the investment demand curve. At the same time, an increase in economy's capital stock, which is an increase in economy's wealth, shifts the saving supply curve upward. The upward shift in the saving supply curve and a downward shift in the investment demand curve gradually shift the position of *B* to the left and that of *C* to the right bringing the two points closer to one another as shown in Stage 2 in the Figure 5.6. Eventually, as a result of the gradual upward and downward shifts in the saving supply and investment demand curves respectively, these curves become tangential and points *B* and *C* coincide as shown in Stage 3 diagram of Figure 5.6.

Both to the right and left of the point of tangency between the investment demand and saving supply curves, saving is higher than investment, i.e., $S > I$. Consequently, the equilibrium at the *B, C* position in Stage 3 is unstable in the downward direction. Since deflationary pressures are at work, the economy will move downward from this unstable equilibrium position towards point *A* which shows the stable equilibrium position corresponding to a very low level of income. At this low level of income, there will be the problem of excess plant capacity. Consequently, the entire capital stock which has depreciated will not be replaced. Thus gross investment will be smaller than depreciation and, therefore, capital stock will decrease tending to shift the investment demand curve *II* upward. On the other hand, at low income the saving supply curve *SS* will either fall (as consumer durables wear out creating a demand for their replacement and as the demand increases for buying more new consumer durable goods) or flatten out. These shifts in the *II* and *SS* curves will tend to move point *C* closer to point *A* as shown in Stage 5 in Figure 5.6. Eventually, points *C* and *A* will coincide as shown in Stage 6 in Figure 5.6. Since both to the right and left of the point of tangency between the *II* and *SS* curves, shown by the position *A* and *C*, investment is more than saving, i.e., $I > S$, inflationary pressures are present in the economy. Consequently, the economy will move upward toward point *B*. This process in which the economy moves downward and upward between points *A* and *B* can continue indefinitely. Figure 5.6 shows one complete trade cycle. The cycles generated by this mechanism will not necessarily be of the same length nor will expansions and contractions be necessarily symmetrical. These

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characteristics will depend on the slopes of and the rate at which the investment demand curve I and the saving supply curve SS shift. It is also possible that no trade cycle will occur.

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Kaldor's theory is simple to understand and is quite ingenious. The cyclical process explained by Kaldor is self-generating. The upward movement to high levels of income generates forces which produce a downward movement at low levels of income and *vice versa*. These cycle generating forces—changes in the average propensity to save and the increase and decrease in the capital stock—are inherent in the economic process. In other words, these forces are endogenous. In Kaldor's model of trade cycle, the non-linearities of the investment demand and saving supply functions which are due to excess capacity, the high costs of construction and the high cost and increased difficulty of borrowing the funds are crucial in explaining the occurrence of the trade cycle.

Kaldor's theory does not employ the acceleration principle in order to explain the trade cycle. In Kaldor's model, investment is related directly to the level of income and inversely to the amount of the economy's capital stock. This approach does away with the unrealistic and inflexible tying of investment to changes in income which is implied in the rigid acceleration principle, retaining, all the same, the basic idea of the acceleration principle. Kaldor's model, which employs the investment demand function of the type $I_t = I_a = eY_{t-1} - hK_t$ incorporating the capital stock adjustment principle, does not make any direct reference to the rate of change of income and output over successive periods. Although the model retains the link between changes in the aggregate output and investment, it has been done in such a way so as to avoid some of the weaknesses of the rigid acceleration principle.

5.5 MONETARY AND FISCAL POLICY FOR ECONOMIC STABILIZATION

Macroeconomic policy has become a very important economic policy instrument of modern welfare state to achieve the desired changes in the size and composition of national income and employment in the economy. After the publication of Keynes' well-known work *The General Theory of Employment, Interest and Money* in 1936, the achievement of price stability, guaranteeing employment to every able-bodied and willing-to-work citizen and raising the level of national product in order to raise the living standards of people in the country are now regarded as important social obligations of the state. To achieve these social goals, the government initiates an appropriate economic policy at the national level. The evolving of a proper economic policy for promoting economic growth with stability and ensuring economic justice for all the people involves the framing of an appropriate economic policy which, while aiming at promoting the rapid economic growth of the economy, reduces the glaring incomes and wealth inequalities in the system.

Indeed the goals of state's economic policy may be many and varied. At different times in history the state has employed economic policy for different purposes which always did not serve the interest of the community at large. For example, Queen Cleopatra of Greece had devalued the Greek drachma by a hefty 75 per cent to finance her luxurious living. Similarly, Charles the Bad, King of Navarre in 1383 had debased his country's coinage by one-third to secure funds to celebrate the release of the heir to the throne from French captivity. Again, one can find many instances of the French kings during the Middle Ages debasing their coins to finance their defensive wars against the English invasions. The goal of the Nazi government's economic policy in Germany was

Check Your Progress

5. How is Kaldor's theory of trade cycle different from other theories?
6. How is the saving supply function similar to the investment demand function?

to mobilize large surpluses to finance Hitler's massive rearmament programme of 1933–39 and his war of 1939–45. Today, however, the three major goals of government's economic policy are the achievement of full employment, stability of foreign exchange rate and price stability and promoting economic growth. All these goals are covered under the slogan 'rapid economic growth with stability'.

The two important subdivisions of macroeconomic policy are the monetary policy and the fiscal policy. These two policies are applied as mutually complementary policies to serve as instruments of the government's economic policy which is applied to achieve certain given social goals. Although there is often considerable overlapping between the monetary and fiscal policies because it is almost impossible to envisage any major fiscal or monetary policy measure which does not affect the other, still it is necessary to draw a meaningful distinction between the monetary policy on the one hand and fiscal policy on the other in order to circumscribe the scope of both these instruments of macroeconomic policy.

Demise and Re-emergence of Monetary Policy

Monetary policy had held the field for a considerable time and had occupied the pride of place in the classical and the neoclassical economic analysis. From Knut Wicksell to John Maynard Keynes (*Treatise on Money*) it was generally believed that by lowering the interest rate and concurrently the supply price or cost of capital goods, monetary policy was capable of raising the investment sufficiently to maintain constancy of the price level or sufficient to achieve utilization of all the factors of production. Conversely, it was believed that a rise in the interest rate would deter the marginal borrowers enough to contain total spending within the limits of total supply at the prevailing general price level. This view about the effectiveness of monetary policy assumed that the interest-elasticity of investment demand function was high enough to ensure absorption in the long period, if not in the short period of a business cycle, of full employment savings.

Soon, however, this high faith in the effectiveness of monetary policy was replaced by despair and the skeptics questioned whether small increases or decreases in the rate of interest, which was a small or rather minor element in total cost of production, could influence the spending decision of the borrowers. Consequently, monetary policy was unceremoniously dragged down from the position of honour. It suffered almost complete emasculation as a result of Keynes' attack. It lost all its prestige and had been given up as an economic policy instrument in the great depression of the 30s. We have seen earlier that in the 'Keynesian range', characterized by the liquidity trap, monetary policy is rendered completely helpless and no amount of increase in the money supply can raise income and employment since the rate of interest becomes 'sticky' at the liquidity trap rate of interest. This Keynesian theoretical innovation exercised a tremendous impact on the development of economics in the post-depression period. Prior to the Keynesian revolution, economists assumed, more or less unanimously, that fiscal policy—government's tax and spending policies—should be tailored to meet the community's public goods' requirement.

Following the Keynesian revolution, all this changed and it began to be increasingly argued that if monetary policy was useless in bringing about full employment, then government should pursue an active fiscal policy by spending more and taxing less. Several ¹¹ were mostly made during the 30s and early 40s which provided strength to the critics of monetary policy by concluding that firms' investment decisions were insensitive to changes in interest rate so that investment demand could be regarded as insensitive to changes in the interest rate. Based largely on the alleged interest inelasticity

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of the investment demand schedule, the critics of monetary policy received further support from the Keynesian view of liquidity preference which stated that monetary policy had little effect on interest rate which could not fall below some positive level, say below two per cent, due to the presence of liquidity trap. In due course of time, fiscal policy completely annihilated the monetary policy. Throughout the 1940s and even upto the mid-1950s, economists sang the unsavoury song of 'money does not matter'. Consequently, monetary policy was completely upstaged and fiscal policy was all the rage.

However, by the mid-1950s a reaction set in. It was being questioned by the skeptics that there may be a liquidity trap but who has ever seen it? The question asked was: does the mere theoretical possibility that in a very rare and limited set of circumstances, an expansionary monetary policy may fail to raise employment and output in the economy justify our discarding the monetary policy for all times and in all situations? The supporters of the monetary policy pleaded that it was unwise to regard monetary policy as generally ineffective on the basis either of the analysis or of the conditions of the 1930s. Those who still believed in the efficacy of monetary policy undertook serious researches to test the effectiveness of the monetary policy. These research studies clearly showed that 'money does matter'. Consequently, monetary policy staged a 'grand' comeback after remaining brow-beaten for almost two decades. In the grand revival of monetary policy in the mid-50s, the contributions of Milton Friedman, his collaborators, students and other followers of the Chicago School of economists have been very important. The Chicago University's Department of Economics has long been associated with the intellectual tradition of the quantity theory of money.

The brute force of events in the post-war period produced a counter-revolution. In many countries, including the United States of America, cheap money policies were pursued partly under the influence of Keynes' ideas. What was the result? Every such country either suffered from hectic open inflation or witnessed a network of partly effective and partly ineffective controls aimed at suppressing the inflationary pressure. In every case the stock of money increased as a consequence of pursuing the cheap money policy and so did the prices either openly or in the disguise of controls. No country that did not check the growth in money stock, succeeded in checking inflation while every country which could effectively stem the growth in the stock of money successfully checked the price rise.

Milton Friedman and some of his students published a collection of essays in 1956 which refocused attention on both the theoretical and empirical relevance of money.¹² Apart from this collection of essays, in 1963 was published Milton Friedman's and Anna Jacobson Schwartz's monumentally scholarly work entitled *A Monetary History of the United States—1867–1960*. The main thesis of this landmark study is that money does matter very much. In short, monetary policy has now regained its lost status and claims parity with fiscal policy as an area of concern, as a field of research and as a technique of economic stabilization.

Instruments of Monetary Policy

The various instruments of monetary policy which the central bank employs to achieve the goals of economic policy can be classified into the general¹³ or quantitative instruments and the selective¹⁴ or qualitative instruments. The general instruments employed by the central bank to carry out its monetary policy are the open market operations, changes in the minimum legal cash reserve ratio and changes in the bank or discount rate. All these three monetary policy instruments influence the credit-creating capacity of commercial banks in the economy by operating directly or indirectly on their excess cash reserves.

When the banks grant credit by making loans and purchasing securities their assets and liabilities portfolios are influenced. On the one hand, banks' assets increase but on the other hand there takes place a corresponding increase in their deposits, primarily the demand deposits. Since apart from keeping operating and safety margin cash reserves, banks are statutorily required to maintain a certain minimum percentage of their total deposit liabilities in the form of cash reserves with the central bank, their capacity to lend more is limited by their excess cash reserves position. If the banks have only sufficient cash reserves with them to meet their minimum legal reserves requirement against their total deposits, they cannot grant any more loans and purchase more securities. In such a situation, when the banks have the total cash reserves which are just adequate to cover their total deposits, further acquisition of earning assets by increasing their deposit liabilities would create a deficiency of cash reserves. Since the bulk of the deposits of banks comprise the money supply, its rate of growth is under the central bank's control by exercising control over the volume of cash reserves held by the commercial banks by raising the percentage of the minimum legal cash reserve ratio requirement which the banks must maintain against their deposits.

The central bank can influence—increase or decrease—the commercial banks' cash reserves through its open market operations. These operations are broadly defined as the bulk purchase or sale of financial instruments by the central bank either in the primary market (open market type operations) or in the secondary market (full-fledged open market operations). The instruments which are commonly used for this purpose include treasury bills, central bank bills or prime commercial paper. The instrument of open market operations is the most effective instrument which is available to the central bank to carry out the objectives of its monetary policy. Being flexible, it enables the central bank to change the direction of its open market operations according to circumstances from a policy of increasing the cash reserves of the commercial banks to decreasing their cash reserves and *vice versa*.

Open market operations are either defensive or dynamic. Defensive operations are those which are taken to offset the other factors that change the volume of banks' cash reserves. For example, if gold outflows or increases in treasury deposits at the central bank are tending to reduce the commercial banks' cash reserves, the central bank may make offsetting government security purchases even though it is not trying to ease its credit policy. Conversely, it may buy securities during the tight money periods if other factors are tending to reduce the commercial banks' cash reserves too fast. Thus it is impossible to tell from a mere sale or purchase of securities whether the central bank is pursuing a defensive or a dynamic open market operations policy without knowing how the other factors are affecting the commercial banks' cash reserves.

In the developed countries with highly developed financial markets, open market operations are usually conducted with treasury bills and/or central bank bills. However, those countries where the financial markets are not fully developed¹⁵ can conduct the open market type operations through the central bank intervention in the primary markets for securities. A common approach employed is the holding of regular auctions of the treasury or central bank bills and vary the net amount auctioned in order to influence the bank reserves. This instrument is often used in combination with other instruments—use of rediscount facilities and changes in the reserve requirements—to achieve the desired reserve impact and to smoothen the day-to-day fluctuations in liquidity.

The instrument of variable minimum legal cash reserve ratio requirement affects not only the total amount of commercial banks' reserves but also the amount of their excess cash reserves which in turn affects their total ability to lend. Thus, the central

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bank can carry out its expansionary monetary policy by increasing their total cash reserves through the open market purchases of securities or, their total cash reserves remaining unchanged, by decreasing the minimum legal cash reserve ratio requirement. As a result of decreasing the minimum legal cash reserves requirement, a part of the existing required cash reserves is reclassified as excess cash reserves and consequently becomes available for credit creation by the banks. In terms of the lending power of commercial banks, cash reserves so released are in effect similar to an addition in banks' excess reserves produced through the open market operations conducted by the central bank. However, due to practical difficulties inherent in making the frequent small changes in the minimum legal reserve ratio requirement, the central bank takes recourse to this instrument of monetary policy only in those situations in which relatively large increases or decreases in the excess cash reserves of banks are considered essential. In India, the Reserve Bank of India has raised the minimum legal cash reserve ratio several times during the 1970s and 1980s in order to exercise credit restraint on the commercial banks. In the 1990s, this ratio had, however, fallen substantially and at present stands at 6.5 per cent.

Changes in the discount or bank rate do not *per se* affect the cash reserves of the commercial banks. Such changes affect the cost at which financial accommodation in the form of borrowing can be made available to the banks from the central bank. From the point of view of controlling the lending or credit-creating capacity of the banks, the instrument of discount or bank rate is the least important of the three general instruments of credit control at the disposal of the central bank because banks generally borrow from the central bank not to expand their earning assets but to meet the shortfall in their cash reserves. And whenever the banks are forced to take recourse to borrowing from the central bank they repay such loans promptly.

Discount or bank rate and other forms of central bank credit control instruments are employed for three purposes—to relieve the shortage of liquidity with the banking system (lender of last resort); to control monetary and credit conditions; and to allocate credit in a selective manner. In operating the discount or bank rate facility, the central bank limits access in various ways. Some central banks rely on the market to limit the access. In such a situation, the discount rate has to be kept high enough so that as a first resort the banks are discouraged from approaching the central bank for financial accommodation and instead obtain funds from other financial sources such as the deposits and inter-bank markets. Other central banks, such as the US Federal Reserve and the German Bundsbank maintain the discount rate below the market levels and limit access to the facility administratively.

Some central banks use changes in the discount rate primarily to signal a change in the monetary policy. Still others use the discount rate window as their main instrument to influence the money market conditions.

The cash reserve ratio requirement instrument directly links the central bank and commercial bank liabilities by forcing the banks to hold a prescribed fraction of public's deposits in the form of currency or deposits with the central bank. It can be used as a means to sterilize excess liquidity with the banks. However, in so far as this instrument lacks flexibility, frequent and large changes in it would be disruptive and costly for the banks. Moreover, in so far as unremunerated reserves requirement is akin to a tax, it can lead to financial disintermediation—to a shift in the flow of funds away from the formal financial sector to the unregulated or informal financial markets. It happens to the extent that, the share of the financial holdings over which the authorities can exert monetary control decreases.

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As the central bank indulges in the open market sales of government securities to restrain the lending or deposit-creating power of the banks, the move simultaneously exerts an upward pressure on the whole structure of interest rates because the bulk sale of securities, which has to be on a mass scale if the credit-creating power of the banks has to be curtailed, is possible only at the falling prices of the government securities sold by the central bank. A fall in the prices of securities raises the yields on these securities and tends to raise the yields on other securities among the higher interest rates. To the extent that demand for bank loans is interest-elastic, a rise in the interest rates cuts the aggregate demand for bank credit. The same result follows by increasing the minimum legal cash reserve ratio requirement for the banks. As a result of this action, banks' excess reserves on which they can raise the pyramid of credit are reduced, forcing them to raise the entire structure of their lending rates in order to discourage borrowers from borrowing. Generally, the central bank reinforces the action of one instrument by applying the other monetary policy instruments also. For example, the restrictive action through the open market sale of securities must be followed by raising the bank rate if the restrictive action has to be really effective. Although the banks typically borrow from the central bank to meet their cash reserves shortages but unless the central bank raises its bank rate as it reduces their total cash reserves to an extent which forces the banks to raise interest rates, there will be a danger of excessive borrowing on the part of banks from the central bank. Commercial banks might use the 'bank rate window' to replenish their cash reserves lost due to open market sales of securities by the central bank and relend these funds at higher interest rate. A rise in the bank rate can prevent the misuse of central bank's bank rate window. When the bank rate is raised under these circumstances, such rise in the bank rate is the effect of the credit tightening made possible through the open market sales of securities undertaken by the central bank.

Certain vital effects of changes in the central bank's bank or discount rate are psychological. Such effects are particularly important when observers feel that the bank rate is being used by the central bank to signal a shift in the direction of the monetary policy. In such cases, the financial markets react immediately—sometimes even in advance of central bank's action—when the move is anticipated. If the bank rate is raised, interest rates—particularly those on short-term securities—generally rise and credit markets tighten. Conversely, a cut in the bank rate, which clearly signals an easing of the central bank's monetary policy, is ordinarily followed by easy conditions in the money and capital markets in the economy.

Apart from these three general instruments of credit control there are the selective or qualitative credit control instruments which are employed by the central bank from time to time. Unlike the general instruments which affect the total volume of credit directly, the selective instruments of monetary policy affect the types of credit extended by the banks—these instruments affect the composition rather than the size of the loan portfolios of the commercial banks. The immediate object of imposing the selective credit controls is to regulate both the amount and the terms on which credit is extended by the banks for selective purposes. For example, since 1956 the Reserve Bank of India by employing the instrument of selective credit control flexibly has successfully determined both the total amount of credit and the terms on which such amount of credit can be granted by the banks for certain specified purposes. In fact, ever since this instrument was first employed by the Reserve Bank of India in 1956, a spate of directives has been issued to the banks instructing them to change both the amount and the terms of credit supply for different purposes from time to time. There has hardly been any year, rather

any month, which did not witness the use of the selective credit control instruments being made by the Reserve Bank of India for some purpose or the other. This instrument has, however, now been discontinued.

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Unlike the general instruments of credit control, the selective credit control instruments enable the central bank to restrict unhealthy expansion of credit for specific purposes say, for financing the speculative purchase of sugar or rice and paddy which may be in short supply and whose stock-building on the part of speculators is likely to lead to price spurt without at the same time curbing credit expansion in general. In this respect, selective credit controls in certain such situations prove effective in meeting the goals of monetary policy where the general credit control instruments may fail.

Contra-cyclical Fiscal Policy

If fiscal policy has to be employed as an instrument of economic stability, it has to be contra-cyclical in nature. The government can contribute to raise the levels of employment, income and economic activity by spending more than its current income. Conversely, it will exert a contractionary effect on employment, income and economic activity by collecting more revenue from the people in the form of taxes than it spends. To use its fiscal policy as an instrument of economic stability, the government should carefully regulate both the time and size of its spending and tax revenue operations. A deficit in the budget in inflation will further aggravate inflation and will, therefore, act as a destabilizing factor rather than act as a stabilizing factor in the economy. But the same policy if enforced in recession will promote economic stability in initiating recovery. Similarly, surplus budgeting in recession by aggravating the fall in the level of aggregate demand will convert a mild recession into a great depression. The same policy, however, if pursued during boom will promote economic stability in the system.

If fiscal policy is to be used as an instrument of economic stability, it is essential to abandon the current practice of balancing the budget annually in the face of fluctuating employment and income. The spending and revenue programmes of the government, which constitute the budget, must be flexible. Rather than balance its budget annually, the government should balance the budget over the period of a trade cycle. A fiscal policy that would contribute most to the economic stability must be such as to produce a surplus of revenue over spending in prosperity with comparatively full employment and a surplus of spending over revenue in a period of depression with abnormally high unemployment. This means that the annual budget should be kept unbalanced. A balanced budget would only be desirable when the economy was operating at full employment level and showed no tendency either to expand or to contract. The fiscal policy of the government should have a feature of automatic stability so that needless delays pending the passage of new appropriation or tax laws may not hamper the smooth operation of fiscal policy. It should have built-in stabilizers which will function automatically and shall remove delays in the execution of the fiscal policy in the absence of built-in stabilizers. The Committee on Economic Development stated the principle of guidance for incorporating the built-in stabilizers in the fiscal policy in the following words:

‘Set tax rates to balance the budget and provide a surplus for debt retirement at an agreed high level of employment and national income. Having set these rates, leave them alone unless there is some major change in national policy or condition of national life.’

The merit of this policy is not difficult to see. With the fall in national income,

government revenue falls relatively to government outlays leading to deficit budget and

vice versa. As a built-in stabilizer, the fiscal policy cushion's the fluctuations by withdrawing more purchasing power from the economy than it injects in the economy during a boom and *vice versa*.¹⁶

Fiscal Policy in Inflation

When resources are fully employed and the economy is tormented by inflation, the appropriate fiscal remedy is to create a budget surplus in order to reduce the aggregate spending. If the total tax collections exceed the total government expenditure, the reduction in private spending caused by tax collections is not fully offset by government expenditure. Consequently, total spending will be less than what it would have been had the budget been balanced. This policy will directly attack the cause of inflation—the rate of increase in the aggregate spending which exceeds the rate of increase in the volume of goods and services which are available for making the purchases in the economy.

A budget surplus will have the largest impact on total spending and, therefore, in checking inflation if the surplus is impounded by the government. *First*, in and of itself the surplus reduces total spending. But if the surplus is impounded, the quantity of money in circulation will fall causing aggregate spending to be reduced still further. Since the taxes which give rise to the surplus in government budget are paid with cheques drawn by the public on commercial banks, the net effect is to reduce the demand deposits in banks by the amount of the budget surplus. Further, as the cheques are deposited by the government in its account with the central bank, the commercial banks' deposits at the central bank are transferred from commercial banks to the government account. This reduces the commercial banks' cash reserves and to the extent it reduces these reserves below the required or desired level, it forces the commercial banks to contract their loans. All this will hold good only if the surplus is impounded by the government.

It is, however, possible that the government may use this surplus to payoff its debt, i.e., to retire or purchase the outstanding government bonds. If the surplus is utilized for retiring the outstanding debt, total spending may or may not be reduced depending upon who owns the bonds which are retired. There are three possibilities. The bonds might be held by the (i) central bank; (ii) commercial banks; and (iii) public. If the budget surplus is used to retire the outstanding government bonds which are held by the individuals and business institutions who would hoard the money received for bonds, the reduction in the aggregate spending occasioned by the surplus in the budget would be the same as it would have been had the entire surplus been impounded by the government. Consequently, the total stock of money in the economy is not changed by the surplus accrual and the debt retirement; the velocity of money is, however, decreased. But the initial surplus and the fall in the velocity of circulation tend to reduce the aggregate spending. On the other hand, if the public spends the entire money received by it due to government retiring its debt the aggregate spending will not be reduced.

If the budget surplus is used to retire the outstanding government securities held by the central bank, the effect is precisely the same as it is when the government impounds the surplus. If the government employs the budget surplus for purposes of retiring the government securities held by the commercial banks, i.e., if it uses its deposits held at the central bank to buy bonds from the commercial banks, then as result of this operation the cash reserves of the commercial banks will increase enabling them to expand credit. Since the commercial banks' cash reserves are increased by the full amount of the budget surplus, their reserves are raised to the same level at which they had stood before the budget surplus had accrued. As a consequence, the banks are able

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to expand their loans and demand deposits to the same old level at which these stood before the budget surplus was built up. Although the primary reduction in aggregate spending caused by the surplus is still effective yet there is no net fall in the money supply and the secondary reductions which would have been caused in spending from this source are eliminated.

Fiscal Policy in Depression

In depression, the economy suffers from rising unemployment, falling income and shrinking economic activity. In slump, the private investment is very small. There is a large idle plant capacity awaiting utilization. Resources are there in the economy but there is no demand for them. The aggregate demand for current output falls very low. The economy faces the paradox of 'actual poverty amidst potential plenty'. In depression, when the existing aggregate private and government spending is too low to achieve full employment, the government must increase public spending by undertaking public works programmes on a massive scale and indirectly inducing people to spend more. The amount of government spending incurred on unemployment doles and payments made to veterans and the aged should be increased. The great merit of public works programmes is that they raise personal incomes and consumption by multiplier time of the original expenditure without depressing the marginal efficiency of investment in the private sector. Aggregate spending can be increased also by reducing the taxes. The effect of a tax-cut would be to increase the amount of disposable income of the individuals and business firms. Sales tax should be abolished and excise duties on consumer goods satisfying the community's basic needs must be reduced.

To relieve the economy of depression, it is not enough to increase the aggregate consumption; aggregate investment should also be simultaneously raised. Fiscal policy can induce changes in the aggregate investment demand by making appropriate changes in the tax structure. Since the marginal efficiency of capital of private investment should be raised, business and corporate taxes should be reduced. Firms engaged in the capital formation in depression should be allowed tax concessions. Government's debt policy should be so designed that public debt should be retired in depression so that the disposable income of the bond-holders may increase causing substantial increase in the aggregate spending in the economy. During depression, like the one of the 1930s, when the *LM* curve becomes almost flat at very low rate of interest, fiscal policy action in the form of increase in government expenditure is most effective in raising the level of aggregate effective demand and employment in the economy.

Fiscal Policy and Economic Growth

The use of fiscal policy for attaining full employment and stable price level in the economy is a development of the past six decades beginning during the 1930s. It was due to (i) the ineffectiveness of monetary policy as a means to remove unemployment during the great depression; (ii) the 'new economics' which was developed by Keynes; and (iii) the increasing importance of government spending and taxation in national income and output. As an instrument of growth with stability, fiscal policy should be so employed that while promoting consumption and investment to the level of optimum utilization of economy's resources it may check inflation. Accelerating the rate of growth requires the allocation of a higher proportion of the fully employed resources to those activities which increase the productive capacity of the economy. In other words, the fraction of the full employment real output devoted to consumption must decrease while that devoted to investment

should increase. Fiscal policy through its tax instruments should encourage investment and discourage consumption so that the production may increase. It is also necessary to increase the rate of capital formation in the economy by reducing the high income-tax rates on personal income.

Fiscal Policy Lags

Like the lags in monetary policy, fiscal policy is also subject to inside and outside lags. So far as the inside recognition lag is concerned, it is more or less the same as in the case of monetary policy. So far as the inside action lag is concerned, this lag arises on account of delay on the part of the government to act in the matter. Due to the fact that all significant changes in tax and expenditure require the prior approval of parliament and state legislatures, the action lag for fiscal policy is long and variable. The actual legislative process surrounding the fiscal policy decisions is very cumbersome and time consuming and renders the fiscal policy a wholly inappropriate instrument of economic stabilization and growth. While the inside action lag for fiscal policy is longest, the outside lag in fiscal policy is shorter than the outside lag in monetary policy because the full effects of fiscal policy actions are felt by the economy significantly more quickly than the full effects of monetary policy actions are felt. According to Rasche and Shapiro, 75 per cent of the full effect of changes in federal defence expenditure is realized in 9 months and of changes in federal personal income tax in six months.¹⁷

Monetary and Fiscal Policies are Complementary

As instruments of government's economic policy, monetary and fiscal policies are complementary. While the monetary policy influences the level of aggregate income and spending in the economy by influencing the total money supply and the cost of borrowing funds from the banks, fiscal policy affects income and spending through its effects on the size, composition and timing of the government spending and revenue. In inflation, economic stability can be achieved quickly and effectively by combining the policy of surplus budgeting with dear money policy. Conversely, in slump recovery can be started more quickly by reinforcing the policy of deficit budgeting with the cheap money policy. Thus, for achieving the economic stability quickly it is necessary to coordinate effectively the two macroeconomic stability instruments. The importance of the monetary and fiscal policies in achieving economic stability was stressed by Mr J Cameron Thomson of the Committee on Economic Development in his testimony before the Douglas Sub-Committee in the following words.

'Fiscal, monetary, and debt policies are appropriate means for attacking the problem of instability in a free society. The problem of instability is essentially a problem of broad forces affecting the overall magnitudes of the economy. The problem arises when millions of workers are simultaneously unemployed, or when there is a general, although probably uneven, rise of most prices. The advantage of fiscal, monetary and debt policies is that they allow the government to influence the overall forces—especially the level of aggregate demand—that determine the stability of the economy without necessarily involving the government in detailed control of the particulars of the economy. These overall measures will, of course, affect different individuals and businesses differently. But the differences are determined by the market process, not by government decisions...'

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Check Your Progress

7. What are the two important subdivisions of macroeconomic policy?
8. What are defensive open market operations?
9. State the result of an increase or raise in the bank rate.
10. State one merit of public works programmes.

5.6 SUMMARY

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In this unit, you have learnt that,

- The innovations theory of trade cycle, associated with the name of well-known economist Joseph A Schumpeter, makes innovations the central cause of the recurrence of business cycle in the modern industrial economies.
- An innovation is the initial application of an invention to commercial production while an invention is the discovery or development of a new process, product or service by scientists or engineers.
- According to Schumpeter, the innovators, formally designated as entrepreneurs, play a leading role in the entire process of capitalistic evolution.
- The innovators comprise the microscopic group of dashing pioneering members of the business community who are constantly on the look-out for something new and different.
- The lower turning point of trade cycle, i.e., recovery occurs when following a period of readjustment to the changed economic circumstances created by the previous boom, prices have fallen to a point where the pioneering businessmen, entertaining the hope that any further fall is most unlikely to happen, once again start innovating.
- The innovations theory of trade cycle suffers from several weaknesses. The depth of the depression is not entirely determined by the disturbances caused by the innovations; it is also attributable to other factors which vary in intensity from one trade cycle to another.
- The nature of the competitive impact of innovations is also very significant in determining the magnitude of the trade cycle.
- If the impact of demand for the new product is reflected in a small decrease in the demand for all other products in general, the loss of demand felt by each one of the old industry will be comparatively mild and readjustment will be easily accomplished.
- In Samuelson's model, interaction between the multiplier and the accelerator is an endogenous force which generates business cycle in the economy.
- In the model of the trade cycle developed by Nicholas Kaldor, consumption (or saving) is a function of income while investment is directly related to income and inversely related to the stock of capital.
- Kaldor's trade cycle theory is simply an extension of the income determination model where the saving-supply function was of the form $S = -a + sY$ and the investment-demand function was of the form $I = +eY$.
- In Kaldor's model, investment is related directly to the level of income and inversely to the amount of the economy's capital stock.
- This approach does away with the unrealistic and inflexible tying of investment to changes in income which is implied in the rigid acceleration principle, retaining, all the same, the basic idea of the acceleration principle.
- Macroeconomic policy has become a very important economic policy instrument of modern welfare state to achieve the desired changes in the size and composition of national income and employment in the economy.

- The goals of state's economic policy may be many and varied. At different times in history the state has employed economic policy for different purposes which always did not serve the interest of the community at large.
- The two important subdivisions of macroeconomic policy are the monetary policy and the fiscal policy. These two policies are applied as mutually complementary policies to serve as instruments of the government's economic policy which is applied to achieve certain given social goals.
- The various instruments of monetary policy which the central bank employs to achieve the goals of economic policy can be classified into the general or quantitative instruments and the selective or qualitative instruments.
- Open market operations are either defensive or dynamic. Defensive operations are those which are taken to offset the other factors that change the volume of banks' cash reserves.
- Discount or bank rate and other forms of central bank credit control instruments are employed for three purposes—to relieve the shortage of liquidity with the banking system (lender of last resort); to control monetary and credit conditions; and to allocate credit in a selective manner.
- When resources are fully employed and the economy is tormented by inflation, the appropriate fiscal remedy is to create a budget surplus in order to reduce the aggregate spending.
- The use of fiscal policy for attaining full employment and stable price level in the economy is a development of the past six decades beginning during the 1930s.
- Fiscal, monetary, and debt policies are appropriate means for attacking the problem of instability in a free society. The problem of instability is essentially a problem of broad forces affecting the overall magnitudes of the economy.

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5.7 KEY TERMS

- **Cash reserve ratio:** Cash Reserve Ratio (CRR) is a specified minimum fraction of the total deposits of customers, which commercial banks have to hold as reserves either in cash or as deposits with the central bank.
- **Contra-cyclical fiscal policy:** Government policy aimed at reducing or neutralizing anti-social effects of economic cycles is known as contra-cyclical fiscal policy.

5.8 ANSWERS TO 'CHECK YOUR PROGRESS'

1. The period required for the construction of factories for innovations to be carried through is important in determining the duration and magnitude of the trade cycle. Longer the period required by the innovation to be carried through, more violent is the necessary readjustment. If the capital equipment for new innovations can be manufactured quickly, the new products by becoming available for sale in the market quickly will cause readjustments to take place before the development of extreme maladjustments.

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2. An innovator is one who is the first to make the commercial application of invention and consequently bears the risks involved in introducing a new product or service or process in the market. The success or failure of an innovation can only be proved by actually producing and marketing the new product.
3. The acceleration principle explains that the net investment I_t during any given time period t depends upon the value of the accelerator v and the change in income in time period t , i.e.,

$$I_t = v\Delta Y_t = v(Y_t - Y_{t-1}).$$
4. One limitation of multiplier-accelerator interaction is the weaknesses of the rigid acceleration principle. Since the naive acceleration principle is unacceptable, the multiplier-accelerator interaction which incorporates the acceleration principle is also unacceptable as a perfect explanation of the occurrence of the trade cycle.
5. In the model of the trade cycle developed by Nicholas Kaldor, consumption (or saving) is a function of income while investment is directly related to income and inversely related to the stock of capital. In other words, the investment demand function is of the capital adjustment type.
6. Like the investment demand function, the saving supply function is also non-linear with the MPS varying corresponding to different income ranges.
7. The two important subdivisions of macroeconomic policy are the monetary policy and the fiscal policy. These two policies are applied as mutually complementary policies to serve as instruments of the government's economic policy which is applied to achieve certain given social goals.
8. Defensive open-market operations are those which are taken to offset the other factors that change the volume of banks' cash reserves. For example, if gold outflows or increases in treasury deposits at the central bank are tending to reduce the commercial banks' cash reserves, the central bank may make offsetting government security purchases even though it is not trying to ease its credit policy.
9. If the bank rate is raised, interest rates—particularly those on short-term securities—generally rise and credit markets tighten.
10. The great merit of public works programmes is that they raise personal incomes and consumption by multiplier time of the original expenditure without depressing the marginal efficiency of investment in the private sector. Aggregate spending can be increased also by reducing the taxes.

5.9 QUESTIONS AND EXERCISES

Short-Answer Questions

1. What are trade cycles? Is it correct to say that the trade cycle is generated by the interaction of the multiplier and the accelerator?
2. State five limitations of innovations theory of trade cycle.
3. Write a short note on the cyclical process in Kaldor's theory.
4. State the inside and outside lags of the fiscal policy.

Long-Answer Questions

1. Explain critically Hicks' theory of the trade cycle.
2. Discuss Schumpeter's theory of the business cycle.
3. Explain the concepts of multiplier and accelerator and the effect of their combined action on the generation of trade cycle.
4. Discuss the instruments of monetary policy.

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Endnotes

- ¹ Joseph A Schumpeter, 'The Explanation of the Business Cycle,' *Economica*, December 1927, p. 295.
- ² Joseph A Schumpeter, *op. cit.*, p. 102.
- ³ Joseph A Schumpeter, *The Theory of Economic Development*, 1934, p. 224.
- ⁴ When the innovations are financed out of real savings, the rate of innovations will be slower. Furthermore, in the absence of inflation caused by the credit financing of the innovations, the disturbances in the price structure will be far less severe than those in the case of credit-financed innovations.
- ⁵ Joseph A Schumpeter, *op. cit.*, p. 166-7.
- ⁶ It can be easily shown that there is no fundamental difference between Samuelson's and Hicks' versions of the multiplier-accelerator model. It can be seen that if we convert, Hicks' version of the model into Samuelson's version of the model, the value of the accelerator v according to Hicks will be higher than the value of the accelerator bv in Samuelson's version since $b < 1$. It is evident from the following two equations:

$$Y_t = G_t + bY_t + bv(Y_{t-1} - Y_{t-2}) \text{ (According to Samuelson)}$$

$$Y_c = G_t + bY_t + v(Y_{t-1} - Y_{t-2}) \text{ (According to Hicks)}$$
- Both these equations are, however, identical except the additional presence of b in the first equation. Since the value of b is less than one, the value of bv will be less than the value of v alone.
- ⁷ James S Duesenberry, 'Hicks on the Trade Cycle,' *The Quarterly Journal of Economics*, August 1950, p. 464-76.
- ⁸ This discussion is based on Kaldor's article 'A Model of the Trade Cycle.' published in *The Economic Journal*, Volume 50, March 1940, p. 78-92, reprinted in *Essays on Economic Stability and Growth*, 1960, Free Press. New York, p. 177-2.
- ⁹ Nicholas Kaldor, *op. cit.*, p. 182.
- ¹⁰ It is more likely that the slope of the saving supply function will fall with the people becoming more accustomed to the high levels of income. They will, therefore, save a smaller proportion of their high income. However, this modification does not affect the general nature of the argument. The argument will hold even if the saving supply curve remains stable and only the investment demand curve shifts downwards.
- ¹¹ See the articles by James E Meade and R W S Andrews reprinted in *Oxford Studies in the Price Mechanism*, 1951, p. 27-30 and p. 51-66.
- ¹² Milton Friedman (ed.), *Studies in the Quantity Theory of Money*, 1956.
- ¹³ These are also called the indirect instruments. The three main types of indirect instruments are the open market operations, the cash reserve ratio requirements and the central bank lending facilities through the bank rate or discount rate window.

- ¹⁴ The most common direct instruments are interest rate controls, credit ceilings and directed lending.
- ¹⁵ The development of deep financial markets is a complex process. It involves the development of competitive financial institutions, substantial infrastructure and a sophisticated legal and regulatory framework.
- ¹⁶ Most of the fiscal built-in stabilizers are on the tax side. Given an existing range of taxes and tax rates, in recession and depression the total tax receipts will fall while these will rise in periods of high employment and inflation. Personal and corporate income-tax and excise duties are the principal stabilizers from the tax side while unemployment dole payments are from the expenditure side.
- ¹⁷ R H Rasche and H T Shapiro, 'The F I B M I T Econometric Model: Its Special Features,' *The American Economic Review*, May 1968, p. 145.



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