M.A. Semester - IInd Sem.
ECONOMICS

Course Code : ECON 121
Course Code: 06 (DSC)

MACRO ECONOMICS

Units 1 to 25

By : Prof. R. Khosla

Revised by Dr. Ajay Sood

Centre for Distance and online Education
Himachal Pradesh University,
Summer Hill, Shimla - 171005

CONTENTS

DSC Course Code ECON 121

Macro-Economics

Unit-I

Micro Foundations of Macro Economics. The basic classical model of income and employment determination. The basic Keynesian model; equilibrium in product and money markets. Multiplier process and the different concepts of multiplier, budget theorem. Macro-Economic Theories of Consumption: Keynesian theory; Relative income, Permanent income, and Life cycle income hypotheses. Pigou effect and real balance effect on demand.

Unit-II

Macro-Economic Theories of Investment: The Keynesian Post-Keynesian, New-Keynesian, and the financial theory of investment determination. Lags in investment. Portfolio disequilibrium and the transmission mechanism. The Demand for Money; The classical, Keynesian and Post-Keynesian approaches.

Unit-III

The supply of Money and Definitions of Money Supply: Inside and outside money, the neutrality of money Equilibrium in money market. The classical and Keynesian dichotomies and their resolution by Patinkin's real balance effect and through IS-LM model respectively. Keynesian and post Keynesian theories of rate interest.

Unit-IV

Growth Models: Harrod-Domar model; Neo-classical model; Golden rule of accumulation; Optimal growth turnpikes. Theories of Trade Cycles: Multiplier- Accelerator interaction model, Kaldor and Hicks' models. Determination of General Price Level; Classical and Keynesian approaches. Theories of Inflation; Demand - pull and cost-push inflation; short and long-run Phillips's curve analysis; The Keynesian, the monetarist and the rational expectations analysis

Unit-V

Keynesian and monetarist perspectives on monetary, fiscal and income policies. Stabilisation policies: Rules Discretion: lagged effects of policies and sale of expectations, Crowding out effect and government budget constrain. Rational expectations and effectiveness of stabilisation policies.

SUGGESTED READINGS

- Aeernogl V. (2019), Macroeconomics, Anamika Pub.& Dis. (P) Ltd.
- Altug S. (2003), Dynamic Macroeconomic Analysis, Cambridge Publishers.
- Bronson, W.H., (1985). Macro-Economic Theory and Policy, Universal Book Stall, New Delhi.
- Chakravarty, S. (1985). Report of the Reserve Bank of India Committee to Review the Monetary System, Reserve Bank of India,

- Dornbusch, R. and S. Fischer (1987). Macroeconomic, 4ed. McGraw-Hill Kogakusha, Tokyo.
- Dombusch, R. and S. Fischer (1987), Macroeconomics, 4e, McGraw-Hill Kogaku Sha Tokyo.
- Edmond, M.R. (1983), Macroeconomics: Theory and Policy, Prentice Hall of India, New Delhi.
- Evans, M.K. (1960), Macroeconomic Activity. Harper and Row, New York.
- Goyal A. (2017), Macroeconomics and Markets, Routledge Publisher
- Gupta, S.B. (1983). Monetary Economics, S. Chand & Co, Delhi.
- Hall, R.E. and J.B. Tayler (1986). Tayler (1986). Macroeconomics, W. W. Norton New York.
- Jones, H.G. (1976). An Introduction in Modern Theories of Economic Growth, McGraw Hill Kogaku Sha Tokyo.
- Kotwal, O.P. (1987). Theories of Inflation. A critical Survey. India McGraw. Hill publishing Co. New Delhi.
- Laidler, D. (1972), Demand for Money Theory and Evidence, Allied Publishers, New Delhi.
- Lipschitz. (2019), Macroeconomics for Professionals, 1st Edition, Cambridge Publishers.
- McConnell, C.R. and H.C. Gupta (1987), Introduction to Macro Economics, Tata-McGraw Hill, Delhi.
- Roy (2012), Economics of Macro Issues, PEA Publishers.
- Scarfe, B.L. (1977). Cycles, Growth and inflation, McGraw Hill, New York.
- Sen, A.K. (Ed.) (1970), Growth Economics, Penguin, Harmondsworth.
- Shapiro, Edward (1984), Macroeconomic Analysis, Galgotia Publication. New Delhi.
- Surrey, M. J.C. ed. (1976). Macroeconomic Themes, Oxford University Press, Oxford.
- Tumandar, P.N. (1972), Investment: Theories and Evidence, McMillion, London.
- Turnovsky, S.J. (1977). Macroeconomic Analysis and Stabilisation Policy. Cambridge University Press, Cambridge.

Unit - 1

MICRO-FOUNDATIONS OF MACROECONOMICS

Structure

1.1 Introduction

The distinction between macroeconomics and microeconomics is firmly established by now. Although they are now regarded as two distinct branches of the science of economics, each having its own subject matter as well as methodological approach, yet it cannot be maintained that they are thoroughly independent of each other. At any rate, there are quite a number of hypotheses of macroeconomics which have their roots in microeconomic theories. It is, therefore, important and useful to be aware of what may be described as the micro-foundations of macroeconomics.

1.2 Learning Objectives

After going through this Chapter you will be able:

- To know Micro foundations of Classical Macro-economics
- To know Micro-economic foundation of Modern-economics
- To know Macro-economic Paradoxes

1.3 Macroeconomics and Micro economics

We presume that you already know about the nature of macro-economics, having studied it at the lower level. Nevertheless, we take this opportunity to recapture with you that macroeconomics is that branch of the science of economics which seeks to analyse and explain the behaviour of an economic system as a whole. While in microeoconomics we generally start with the analysis of the behaviour of the individual units of the system, such as the individual consumer, the individual firm or producer, or the individual employer, and so on, and derive our conclusions with regard to the aggregate behaviour of the system on the basis of our understanding of the behaviour of the individual units, in macroeconomics we study, analyse and explain the aggregative behaviour of an economic system directly. Macroeconomics is directly "concerned with the relation among large statistical aggregates," such as national income, the general price level, national consumption, national savings, national investment, and so on, It thus distinguishes itself from microeconomics in that it seeks to understand the behaviour of an economic system on the basis of the behaviour and the mutual behaviour relationships among the large aggregates of the system there than on the basis of the behaviour of its individual units.

The above distinction between macroeconomics and microeconomics is based on the method of approach to the analysis of the behaviour of an economics system. Macroeconomics is distinguished from microeconomics on the basis of the subject matter also. Microeconomics is essentially concerned with the analysis of allocation of given resources in order to satisfy alternative ends. Since this allocation of resources in the modern monetised market economies (without central economic planning) takes place through the price mechanism of free markets, microeconomics analyses and explains how relative prices of goods and factor services are determined and how they and changes in them affect the demands for and the supplies of the various goods and. factor services. Macroeconomics, on the other hand, is not directly concerned with the determination of relative prices. It is essentially concerned with the analysis of the factors which determine the level of income and employment in an economy and the fluctuations in that level as well as with the analysis of factors which determine the long-term growth of the real income of an economy. Moreover, it is generally concerned with the analysis of the determination of and changes in the general price level which, in microeconomics, is assumed to be given and constant. On the other hand, unlike microeconomics it does not generally deal with the analysis of relative prices.

Despite the above explained clear distinction between macro-economics and microeconomics, there is no water-tight compartmentalisation between these two branches of economics. There are areas where they overlap. The theory of distribution is a conspicuous example of it. This theory which is an important component of microeconomics lies, in fact on the border land of macro-economics.

Moreover, micro and macro are relative terms. It is generally not possible to declare off-hand in all cases as to which is a quantity and which is a quantity. Although in certain cases, one may be sure about the absolute micro unit such as an individual consumer, an individual firm, an individual supplier of a particular factor service and so on, yet one may not be so certain about the macro unit. For example how are we to regard an individual industry? Is it a micro unit or a macro unit? We cannot give an off-hand correct answer to such a question. For, when we look at an individual industry in relation with the individual firms comprising that industry, it is a macro unit. But when we look at it in relation with the economy as a whole, it is a micro unit. Similarly, when we are studying national income, the incomes of the different regions of the national state will be regarded as micro units but when we are studying the income behaviour of a particular region or province or constituent state in itself, it will be regarded as a macro unit. Even national income of a particular country will become a micro unit in a study which focuses on world income and in which national incomes of particular countries are treated as individual units.

When it is said that macroeconomics is directly concerned with the relation among large statistical aggregates, viz. national income, general prices, total consumption, total savings and total investment," it does not necessarily imply that macroeconomics scrupulously avoids resort to microeconomic analysis of all sorts. In fact, the above sort of description of the nature of macroeconomics is fully valid in the case of purely empirical macroeconomic sudies only. A purely empirical macroeconomic study unsupported by any kind of theory would be an incomplete and imperfect study. It is when we face the problem of providing a theoretical support to a statistical or empirical macroeconomic study that we have consciously or unconsciously, to take resort, to microeconomic analysis also. Thus we shall find that there are not a few macroeconomic proposition which have their foundations in microeconomics. We shall illustrate this point below in conjunction with some of the more important macroeconomic theories.

Self Check Exercise-1

Q1. Compare and contrast Microeconomics and Macro economics.

1.4 Micro-foundations of Classical Macroeconomics

The main classical macroeconomic prepositions are found in the writings of Adam Smith. David Ricardo, J.B. Say and J.S. Mill amongst others. As a matter of fact, it would not be wrong to state that classical economics is essentially and chiefly macroeconomics inasmuch as the objective of its study is to analyse the factors which govern the level and growth of the "wealth of nations". But in the process of analysing the forces which lead to the growth of the wealth of nations the clas nl economists invariably took resort to explaining it with reference to individual behaviour. In Adam Smith's Wealth of Nations for example, capital accumulation is made out to be the linchpin of the process of economic growth. But how does Adam Smith explain capital accumulation which according to him, depends on the amount and rate of saving? He frequently resorts to explaining it with reference to individual behaviour. "As the capital of an individual," observes Adam Smith,"can be increased only by what he saves from his annual revenue or his annual gains, so the capital of a society......can be increased only in the same manner." (The Wealth of Nations Book II. Ch.3). Apart from capital accumulation, another important factor which, according to Adam Smith, accounts for the growth of the wealth of nations is the division of labour, and he explains the spread of division of labour in an economy with reference to the individual or microeconomic behaviour which, according to him, is guided by the self-interest of the individual. "It is not from the benevolence of butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own interest." (The Wealth of Nations, Book I, Ch.2.).

Of all the classical macroeconomic proposition perhaps, the most important is the so-called Say's Law which seems to stress that aggregate demand always equals aggregate supply and, hence, there can never be general over-production and general unemployment. How did the classicals arrive at this proposition? Here again they took resort to the individual or microeconomic behvaour. This is clearly evident in Ricardo's formulation of this law which he explains in terms of the behaviour of the individual producer. "No man produce," argues Ricardo, "but a view to consume or sell, and he never sells, but with an intention to purchase some other commodity, which may be immediately useful to him, or which may contribute to future production. By producing, then he necessarily becomes either the consumer of his own goods, or the purchaser and consumer of the goods of some other person." (Principles of Political Economy and Taxation,ch XXI). What is important in the present context is not whether Ricardo's formulation of Say's Law was valid or not but the fact that his particular formulation of Say's Law was rooted in the microeconomic behaviour assumptions with regard to the individual producer.

Self Check Exercise-2

Q1. Discuss about Micro foundations of Classical Macro economics.

1.5 Microeconomic Foundations of Modern Macro-economics

Even the modern macroeconomics has not been able to pass by microeconomic analysis. Modern macro- economics is generally regarded to have come into existence with the publication of J.M Keynes General Theory of Employment, Interest and Money in 1936. Since then there have been further developments and refinements. But microeconomic roots of modern macroeconomics can be discovered in various component theories of it. The most outstanding example of it is the macroeconomic theory of the consumption function.

It was Keynes who, in his General Theory, propounded for the first time a theory of the consumption function which is now usually referred to as the Absolute Income Hypothesis, as it emphasises that the aggregate consumption expenditure in an economy is the function of the absolute level of income. Keynes recognised that consumption expenditure of a community is determined by a number of factors which he classified into objective and subjective factors. But he maintained that of all these factors, income is the most important single factor. His hypothesis was that consumption expenditure tended to increase with increase in the level of income but it did not increase as much as the increase in income. In other words, he emphasised a particular attribute of the consumption function which is now referred to as the marginal propensity to consume having a value greater than zero but less than unity. Moreover, his hypothesis also emphasised another attribute of the consumption function, namely, that the marginal propensity to consume of a community tends to decline with the rise in the income level of the community so that a higher level of income is associated with a lower marginal propensity to consume.

Now, the above Psychological Law, as Keynes described it is his General Theory, can be discovered directly from the statistical data related to the national income accounts of various countries. But when the problem of explaining this functional relationship between income and consumption expenditure come up, the macroeconomic analysis has to lean on microeconomic analysis. Although Keynes did not make it explicit in his General Theory, nevertheless the micro-foundations of his Psychological Law can de discerned between the lines.

His reference to the subjective factors determining propensity to consume is nothing but a reference to the preference scales of the individuals making up community. How the individuals making up a community distribute their income between consumption and saving depends on their preference scales or indifference maps which as we know is a standard proposition of the microeconomic theory of consumer demand. The indifference analysis of the microeconomic theory of demand can be easily made use of in order to support the macroeconomic theories of consumption expenditure. But we know that the microeconomic theory of consumer demand is based on the assumption of consumers behaving rationally in the sense of seeking to be maximising their utility functions. Such an assumption is implicit in Keynes's hypothesis of the consumption function.

There have been further developments in the macroeconomic theory of consumption expenditure yielding at least three important hypotheses, namely, Duesenberry's Relative Income Hypothesis, Friedman's Permanent Income Hypothesis and the Life Cycle Hypothesis as developed by Ando, Brumberg and Modigliani. The assumption of rational or utility maximising conduct is more or less explicit in these different theories which reveals the micro-foundations of the macroeconomic theories of consumption.

The macroeconomic theories of Friedman and Modigliani in particular are based on the explicit assumption that consumers make their decisions regarding consumption/saving rationally, that is, they make such decisions with the motive to maximize their inutility by allocating a life time stream of income to an optimum life-time pattern of consumption. Thus these theories have a basic foundation in the micro-economic theory of consumer demand. We present below a simplified model, a two-period model, of such decision- making revealing thus the basic micro-foundation of these macroeconomic thecries.

The utility foundation of an individual in this context can be written as follows:

(1) $U=U\ (C_0, C_1, C_2,. \quad C_r)$

where U is life-time utility which is foundation of real consumption C. $C_0, C_1, C_2, \quad C_r$ represent real consumption in periods 0,1,2,......T where T is the period just before the individual dies. We rule out inheritance and bequest confining the model to earned income only.

The individual will maximise his utility function subject to the constraint that the present value of his total consumption in life cannot exceed the present value of his total life-time stream of income. In other words the said constraint is as follow:—

(2) $$\sum_{0}^{T} \frac{Y_t}{(1+r)^t} \sum_{0}^{T} \frac{C_t}{(1+r)^t}$$

where T represents the individual's expected life-time, and r is the rate of interest (discount)

As a matter of fact, the above constraint implies that an individual can allocate his income stream to a consumption stream by borrowing and lending.

In a simple two-period case, the above generalised constrain: will have the following form :

(3) $$C_0 + \frac{C_1}{1+r} = Y_0 + \frac{Y_1}{1+r}$$

where C_0 is the consumption of the current period t_0 and C_1 is the consumption of the next period, t_1. Similarly, Y_0 is the current-period income and Y_1, the next-period income, and r is the rate of interest.

It is assumed that the individual can lend or borrow at the interest rate r; that is, if his current consumption is less than his current income, he can lend his savings (Y_0-C_0) at the r rate of interest. Thus

(4) $S_0 = Y_0 - C_0$ money lent out in period t_0.]

The amount lent out in period t_0 will come back with interest in period t_1 so that consumption in period t_1 can exceed the income of period t_1 by that amount. Thus in period t_1 there would be dis-saving or negative savings amounting to the amount lent out in period t_0 plus the interest on it. Hence the savings in period t_1 will be :

(5) $S_1 = —(1+r)\ S_0 = Y_1 — C_1$

The minus sign signifies that S_1 is negative, that is there is in fact dis-saving in period t_1

Dividing equation (5) by equation (4) :

(6) $$\frac{S_1}{S_0} = -\frac{(1+r)S_0}{S_0} = \frac{Y_1 - C_1}{Y_0 - C_0}$$

From the right-hand equality in (6) above we can get the following equality (7) by cancelling S_0 and multiplying the both sides by (Y_0-C_0) :

(7) $Y_1 — C_1 = —(1 + r)\ (Y_0 — C_0)$

The equation (7) signifies that the individual can consume more than his income in a future period (when income is expected to be rather low) by saving out of the current (high) income and lending it out.

We can explain it geometrically also with the help of the following diagram.

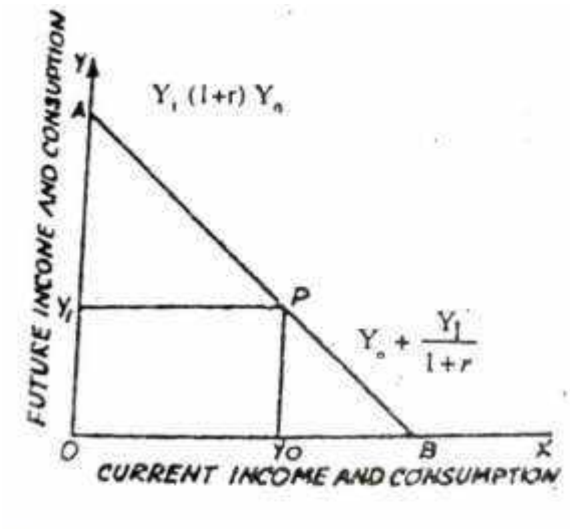


Fig. 1.1

In the above Fig. 1.1 Y_0 is the income of the current period t_0. But the individual can borrow now and pay back the loan out of the income of the next period, t_1.

Y_1 The maximum loan that he can get is $\frac{Y_1}{1+r}$. Hence the 1+r maximum present consumption that he can indulge in is $Y_0 + \frac{Y_1}{1+r}$ which equals OB in Fig. 1.1 Y_1 is the future income of period t_1 and r is the rate of interest. On the other hand, the maximum consumption in period t_1 that is possible for the individual under consideration is $Y_1 + (1+r)\ Y_0$ for he can save the whole of the income of the current period t_0 which is Y_0 and lend it out to get it back with interest in the next period t_1. Hence the consumption possibility for period t_1 is given by the expression, $Y_1 + (1+r)\ Y_0$ which equals OA in Fig. 1.1 above. Thus AB line in Fig. 1.1 represents the consumption-possibility line or the budget constraint.

If we superimpose on the above Fig. 1.1, the indifference map of our individual consumer showing his preference scale for present and future consumption or, which is the same thing for present consumption and saving we shall get a diagram as depicted in Fig. 1.2 below :

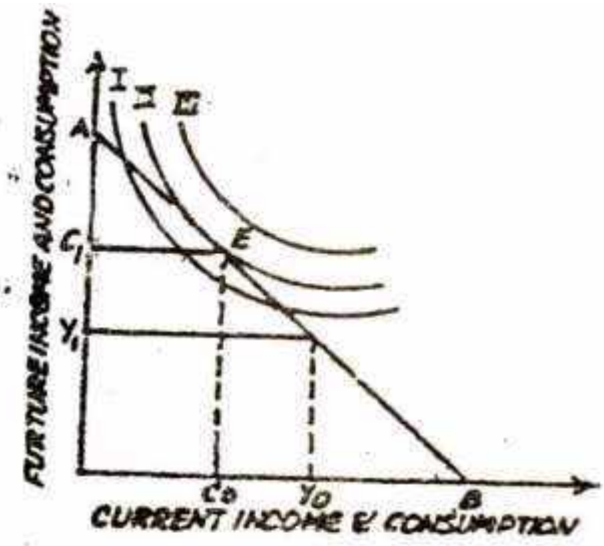


Fig. 1.2

I, II, III are the indifference curves of the consumer whose utility function is maximised at point. E where the budget constraint AB is tangent to indifference curve II. Therefore our individual consumer will save Y_0 C_0 out of his current income which he will lend out to receive back with interest in the next period to be consumed in excess of his income of that period.

It should be noted that the slope of the budget constraint in the above model is determined by the rate of interest, r. If this rate- remains constant, the slope of the budget line will remain constant, and any increase in Y_0 or Y_1 or both will shift the budget line rightward in a parallel manner enabling the consumer to reach a higher level of utility as the new equilibrium will take place on a higher indifference curve. The above analysis also implies that unless current consumption or future also consumption is regarded as an inferior good, any increase in current income or expected increase in future income will increase both the current consumption and future consumption.

Basically the macro theories of the consumption function as developed by Friedman and Modigliani are rooted in the above micro model. The relationship sbetween the present value of the income stream and current consumption as depicted in Fig. 1.2 above yields the following general formulation of the macroeconomic consumption function.

$C1 = f\ (PV_1)\ ;\ f' > 0$

where PV_1 is the present value of current and future income at time t and equals $\sum \frac{Y_t}{(1+r)^t}$ The expression $f > 0$ shows that the differential of the function $C = f\ (PV_t)$ is positive, that is, marginal propensity to consume is greater than zero.

The models of Friedman and Modigliani are complicated. Compared to them, Keynes's model of the consumption function is rather simple. However, the micro-model that we have explained about to be underlying the macro-models of Friedman and Modigliani also lies at the back of Keynes's Model.

When we come to consider the macroeconomic theories of investment particularly Kaynes's theory of investment, the microeconomic underpinings become much more obvious than in the case of macro theories of consumption. It is true that Keynes, in his General highlighted the cases which he found to suffer from what he described as "fallacy of composition." In almost all such cases he found an attempt to apply the results of micro theories to macro-economic problem on the assumption that what is true in the case of an individual enterprise is true in the case of the economy as a whole. The microeconomic proposition with regard to the effect of a wage cut on employment was the most outstanding example of fallacy of composition in his eyes, for he found it simply foolish to argue that since a wage cut induces an individual entrepreneur to increase employment an all-round cut in wage rates would increase the general level of employment also. Keynes's highlighting of such macroeconomic paradoxes as a general cut in wage rates leading not to increased but decreased employment carried the misleading impression that macroeconomics could not be grounded in microeconomic theories, that it had to be liberated from microeconomic and made independent. This is precisely not true. Derivation of macroeconomic propositions from microeconomic theories need not and. in fact, does not lead to fallacy of composition in all cases. Keynes's own theory of investment is a proof of it.

Keynes's marginal-efficiency-of-capital theory of investment is hardly different from the marginal productivity theory of investment of the established microeconomics except in that his theory is relatively more refined and elaborate. But the essential proposition that entrepreneurs, while deciding upon the amount and form of investment, compare its marginal efficiency with the prevailing rate of interest is not dissimilar to be established proposition of microeconomics that es entrepreneurs, while deciding upon investment, compare be the marginal productivity of capital with the prevailing rate of interest. Moreover, the line of reasoning is the Des standard one followed in microeconomic analysis which starts from the assumption of the rational or profit- maximising behaviour of the individual entrepreneur and also the assumption that what is true in the case of individual entrepreneur is also true in the case of collectivity of entrepreneurs in this context. The inverse relationship between rate of interest and volume of investment in Keynes's theory of investment has thus any obvious micro-foundation.

Even the Acceleration Theory of investment of macroeconomics has its groundings in microeconomics. The basic idea underlying this theory is that the demand for investment goods is a derived demand and, therefore, it depends on the level and changes in the level of demand for the final goods which the investment goods help to produce which, in turn, depends on the level and changes in the level of income. This proposition is hardly different from the proposition underlying the microeconomic theory of demand for factors of production which too is explicitly regarded as a derived demand in this theory.

We can thus conclude that macroeconomics is not a discipline which is completely cut off from and independent of microeconomics. In spite of some conspicuous cases of fallacy of composition to which Keynes's General Theory attracted attention, there are many macroeconomic propositions which have been raised on micro-economic foundations.

Self Check Exercise-3

Q1. Discuss about Micro foundations of Modern Macro economics.

1.6 Macroeconomic Paradoxes

However, the fact that many macroeconomic propositions have their foundations in microeconomic theory should not induce us to believe that whatever is true in the case of a micro-economic unit is also true in the case of macro-economy. In other words, it is important to guard against possible dangers of falling into the trap of fallacy of composition while extending the microeconomic propositions to a macroeconomy. Hereunder we refer to a couple of such cases to which, as we have noted earlier, Keynes, had called attention.

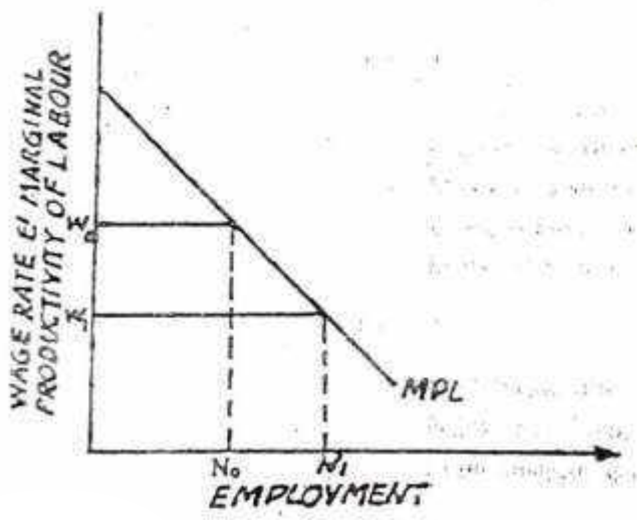


Fig. 1.3

A wage cut in a particular enterprise and even in a particular industry may result in increased employment in that enterprise and even in the particular industry. It is because a wage cut in a particular enterprise or industry would generally not lead to a shift in the demand curve for the product of that enterprise or industry, because the workers of that enterprise or industry whose wages have been reduced are not the sole buyers of the product of that enterprise or industry. Hence the fall in their purchasing power due to the wage cut may have no or little effect on the demand for the product of the enterprise or industry. Hence the demand curve for labour will not shift and a lower wage rate will result in increased employment as shown in Fig.1.3 below.

MPL curve in Fig. 1.3 represents the marginal productivity of labour in particular enterprise or industry. Therefore it represents the demand curve of this enterprise or industry for labour. The entrepreneurs who seek to maximise their profits are able to realise this goal by employing so much labour that the marginal product of labour equals the wage rate. Supposing initial wage rate to be W_0, this condition of profit maximisation is fulfilled at employment No. Now, if wage rate is reduced to W_1, the profit maximising employment will be N_1, which is greater than N_0.

But, if there is all-round cut in wage rates, the above result need not follow. In fact, it may lead to decreased employment. This is a macroeconomic paradox resulting from fallacy of composition. The cause of this paradox or fallacy of composition is that a general cut in wage rates will reduce the incomes and, therefore, the purchasing power of the class of workers as a whole who normally make up the majority in any society. As a result of it, the aggregate demand for the product of the economy as a whole and consequently the demand curve for labour cannot remain stay put as in the case of an individual enterprise or industry discussed above. On the contrary, it will shift the demand curve to the left as a result of which a lower and not a higher level of employment will prevails as show in Fig. 1.4 below.

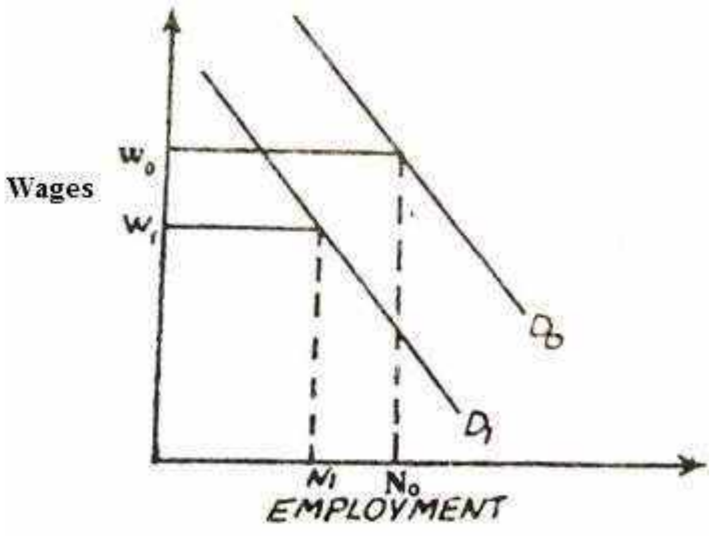


Fig. 1.4

The initial demand curve is D_0 and the initial wage rate is W_0. The profit-maximisation condition is met at N_0 employment. With the wage cut to W_1 in the economy as a whole, the demand curve shifts to the position D_1. The new equilibrium takes place on this shifted demand curve D_1 whereon the lower wage rate W_1 is associated with N_1 employment which in this case is less than the initial N_0 employment. Thus concluding from the microeconomic case of a particular enterprise or industry that a general cut in wage rate will increase employment in all industries and enterprises and hence in the economy as whole will result in a fallacy of composition which cannot be valid.

Another instance of such a macroeconomic paradox and fallacy of composition is the proposition, founded in microeconomic analysis, that when all individuals increase their savings, it would increase the savings of the economy as a whole. But, in fact, it would not be so. Rather it will result in the paradox that the more all the individuals in a society try to increase their individual savings, the less will they find to be actually saving. Why is it so? It is because when everyone is trying to save more, it means all are cutting down their which depresses the consumption expenditures which aggregate effective demand in the economy. As a result of it, the level of income falls. With reduced incomes the people are actually able to save not more but less. This explains the paradox and exposes the fallacy of composition of the proposition that when all individuals save more, it will increase the savings of the economy as a whole.

The moral of considering the above paradoxes is not that the results of micro theories can in no case be applied to macro problems but that we should be on our guard while making such applications so that we do not fall into the trap of fallacy of composition.

Self Check Exercise-4

Q1. Discuss about Macro economic Paradoxes.

1.7 Summary

The microeconomics studies:

1.6.1 Theory of Product Pricing with its two constituents, namely, the theory of consumer's behaviour and the theory of production and costs.

1.6.2 Theory of factor Pricing with its four constituents, namely, the theory of wages, rent, interest and profits.

1.6.3 Theory of Economic Welfare also comes under the study of Micro economics.

1.6.4 Microeconomics is sometimes referred to as price theory, the rcoson being that prices are the core of microeconomics.

The Macroeconomics Studies:

1.6.5 Theory of Income, out-put and employment with its two constituents, namely the theory of consumption function and the theory of Investment function. The theory of business cycles is also a part and parcel of the theory of income, out-put and employment.

1.6.6. Theory of Prices with its constituents of the theories of inflation, deflation and reflation.

1.6.7 Theory of Economic growth dealing with the Long-run growth of income, out-put and employment as applied to developed and underdeveloped countries.

1.6.8 Macro Theory of Distribution dealing with the relative shares of wages and profits in the total national income.

1.8 Glossary

MICRO and Macroeconomics are interdependent. Micro economics contributes to Macroeconomics and Macroeconomics in its turn contributes to microeconomics. Though Micro economics and Macroeconomics deal with different subjects, yet there is good deal of interdependence between them. The two approaches are, therefore, not in any way mutually exclusive and as such must be properly integrated to secure fruitful results. In the words of proof. Samuelson, "There is really no opposition between micro and macro economics. Both are absolutely vital. You are less than half educated, if you understand the one while being ignorant of the other."

1.9 Answers To Self Check Exercises

Self Check exercise -1

Ans.1. Refer to Section 1.3

Self Check exercise -2

Ans.1. Refer to Section 1.4

Self Check exercise -3

Ans.1. Refer to Section 1.5

Self Check exercise -4

Ans.1. Refer to Section 1.6

1.10 References/ SUGGESTED READINGS

1. G. C. Harcourt, Micro-foundations of Macroeconomics
2. W.H. Branson, Macroeconomic Theory and Policy, Ch. 10

1.11 Terminal Questions

Q.1 Distinguish between Microeconomics and Macroeconomics. What is the relationship between the two.

Q.2 Distinguish between Macro economics and microeconomics. To what extent are the fundamental principles of Microeconomics applicable to Macro economics?

*****

Unit - 2

THE BASIC CLASSICAL MODEL

Structure

2.1 Introduction

Following the publication of Adam Simth's Classic, The wealth of Nations in 1776 a body of economic theory was gradually developed during the century and a half. The chief architects of this theory known as classical economic theory, were David Ricardo, John Stuart Mill, Alfred Marshall and the French economist Jean Babtiste say. The problem unemployment was not the primary concern of this theory. The classical economists assumed that full employment was a normal feature in the economy. According to them, in a Laissez-faire economy market forces operated in the system which maintained full employment. Full employment, in the classical theory, was a rule in long period and deviations from it were viewed only temporary exceptions. Full employment did not, however, rule only the existence of some unemployment in the economy. In the classical view, Lapses from full employment were infrequent and short lived.

2.2 Learning Objectives

After going through this Chapter you will be able:

- To know the Fundamental Propositions of Classical Model
- To know the Say's Law of Market
- To understand basic Classical Model
- To understand Equilibrium in Labour Market

2.3 The Fundamental Proposition

There is no explicit, systematic formal theory of income and employment determination to be found in the writings of the classical economists like Adam Smith, David Ricardo, J.B.Say and J.S. Mill. However, it is possible to piece together such a theory on the basis of the ideas and propositions found in their writings.

The fundamental idea of the classical model of income and employment determination is that the level of income and employment in a free-market economy is determined by the quantity and quality of the factors of production available in the economy. By quality of the factors, of course, is meant the productivity of factors of production. The greater is the quantity and the higher is the productivity of the available productive factors, the higher is the level of real income (or output) and employment in a free-market economy.

The above basic proposition of the classical theory implies that the classicals did not apprehend that there could ever be difficulties arising from the side of aggregate effective demand which could disable the system to make the full use of the available productive capacityus other words, the basic classical model rules out the possibility of situations when the aggregate demand for the goods and services produced in the economy falls short of their aggregate supply as a result of which there is general overproduction and general unemployment in the economy. This is the proposition found in the famous classical law known as the Say's Law of Market's which allows for partial overproduction and unemployment but rules cut general over production and general unemployment.

Self Check Exercise-1

Q1. Discuss the fundamental idea of the Classical model of Income and employment determination.

2.4 Say's Law

As Mark Blaug has pointed out in his Economic Theory in Retrospect, Say's Law as interpreted over time has two versions, one of which may be described as Say's Identity, while the other one may be described as Say's Equality. In its original form as formulated by J.B. Say himself and his contemporaries like Ricardo and James Mill, it was an identity which did not stand the chance of being refuted logically, though later on it was reformulated in the form of an equality which stood the chance of being refuted at least in principle.

The basic proposition contained in Say's Law is that "supply creates its own demand" and, therefore, there cannot be any possibility of the aggregate demand for goods falling short of the aggregate supply. Hence the law ruled out the possibility of general overproduction and unemployment. However, it did admit the possibility that due to miscalculations the demand for a particular good may fall short of its supply, but in the case. it stipulated, this would be matched with a situation of excess demand for some other good. Which means that though condition of overproduction and unemployment in particular industries might be possible but such a condition would be exactly matched with a condition of underproduction somewhere else so that when we consider the economy as a whole, there can be no overproduction of goods and consequently there can be no general unemployment.

The important implication of Say's Law as stated above is that any increase in productive resources or in their productivity is worth making use of without any fear of there developing unsold surpluses of goods. Or, as Hansen has put it, "The classic statement of Say's Law maintained the thesis that the free price system tends to provide a place for growing population and an increase in capital." The market, according to Say's Law, is "as big as the volume of products offered in exchange. Supply creates its own demand." (Hansen)

Many a time the classical econmists expressed this idea in the form of an identity. Ricardo's statement of this law illustrates this point. "No man produces," states Ricardo, "but with a view to consume or sell, and he never sells but with an intention to purchase some other commodity, which may be immediately useful to him or which may contribute to further production. By producing, then he necessarliy becomes either the consumer of his own goods or the purchaser and consumer of the goods of some other person." The implication of Ricardo's formultion of Say's Law is that a part of production of the system is consumed directly by the producers themselves. The other part enters exchange generating money income which is partly used to buy and consume consumer goods not being produced by particular producers themselves. The remainder of the money income is savings which are assumed to be invested fully in the purchase of goods "which may contribute to further production." Thus the law assumes that full-employment savings are invariably invested. Hence there can be no question of the system slipping into general overproduction and unemployment.

Stated in the above form, Say's Law is valid only in a barter economy or, at best, in an economy where workers are self-employed like peasants and handicraftsmen which, perhaps, was largely the case when the early classicals were formulating their theories. In such an economy any savings made tend to be automatically invested. It was this which gave rise to the "saving-is-spending" theorem of the classical economics. In such an economy either money is not used (barter economy) or, if it is used, it is used only as a unit of account, or even if it is used as both a unit of account and a medium of exchange, the implicit assumption of Say's Law is that it is spent as soon as it is received: money is not demanded for its own sake. In other words, the classical model does not recognise the function of money as a store of value or, as Friedman would like to put it, its function as a "temporary abode of purchasing power" is not recognised.

Say's Equality is a different matter. Mark Blaug has aptly observed in his Economic Theory in Retrospect that "whatever Say's Law meant to them, it was not that gluts cannot possibly occur in the real world." Say's Equality which is a more correct interpretation of Say's Law and a more objective representation of the classical view, embodies the fundamental postulate of the classical model, namely, that a freely competitive market economy has an inherent tendency to attain full-employment equilibrium. This version did not rule out the possibility of aggregate demand falling short of the aggregate supply and the resulting general overproduction and unemployment. But it is stressed that such a situation would be a disequilibrium situation which would generate within the system such forces as the result of which this state of overproduction and general unemployment would automatically be corrected and the system would regain its equilbrium at the full-employment level. In the classical model there is unique equilibrium which takes place only at the full-employment level. So long as it is not attained, the system is in disequilibrium.

But how does the macro system in the classical model tend to attain the unique full-employment equilibrium automatically? This it does through the price mechanism. The classical model is based on the assumption of a freely competitive economic system in which all prices inclusive of the factor prices are perfectly flexible upwards as well as downwards. When the aggregate demand happens to be less than the aggregate supply of goods, the prices of goods tend to fall and, at the same time, the factor prices, importantly wage rates and interest rate, also begin to fall. As the result of it the demand for goods and factor services would increase and thus the equilibrium of the system would be restored at the full-employment level.

Thus, while Say's Identity implied that aggregate demand for goods was always equal to their aggregate supply regardless of variation in prices, Says's Equality emphasises that the aggregate demand tends to equal the full-employment level of aggregate supply not in spite of the variations in prices but because of these variations in prices. Prices look after the equilibrium in particular markets, and when particular markets are in equilibrium, the macro system as a whole is also in equilibrium. If workers are involuntarily unemployed, the wage rate would come down sufficiently to induce the employers to increase the employment of labour so that all workers willing to work at the going rate of wages are able to find work. Similarly, if there is leakage from the income-expenditure flow in the form of savings, the rate of interest would go down sufficiently to induce the entrepreneurs to increase their investment sufficiently to absorb the increased savings.

How this automatic tendency of a freely competitive economic system with perfectly flexible prices to attain full-employment equilibrium works can be explained with the help of Walras's Law and Walras's formulation of Say's Law.

A situation of aggregate demand falling short of the full-employment aggregate supply may be depicted in the form of an inequality as follows:

$$\sum_{t=1}^{n-1} P_i.D_i < \sum_{t=1}^{n-1} P_i.D_i$$

Supposing n-1 as the number of real goods and the nth good as money, the Walras' Law implies that the above inequality in the goods market would be matched with a reverse inequality in the money market as below:

$D_n > S_n$

In other words, when the aggregate demand for goods falls short of the full-employment aggregate supply of goods, the demand for money will exceed the supply of money. In consequence of these in equalities there is disequilibrium in the goods market as well as the money market. But this very disequilibrium in the goods market will cause a fall in the prices of goods, provided the prices are perfectly flexible. This will tend to increase the aggregate demand for goods in itself. However, a reinforcement of demand for goods will take place in another way also. As Patinkin has emphasised, the demand for money balances is, in fact, a demand for real balances $\left(\frac{M}{P}\right)$.

A fall in the price level (P) would increase the real balances in the hands of the people. Finding that they are holding more real balances than they desire to, they would tend to get rid of their excess holdings of real balances $\left(\frac{M}{P}\right)$ by spending money on goods or/and purchasing bonds and securities. The former increases the demand for goods, while the latter reduces the rate of interest by increasing the supply of loanable funds. The fall in the rate of interest induces entrepreneurs to increase investment which further augments the aggregate demand. This process of falling prices and interest rate goes on till the full-employment equilibrium is restored.

Thus, the basic and the most fundamental postulate of the classical model is that given the perfect flexibility of prices inclusive of factor prices, a perfectly competitive economy automatically tends towards a full-employment equilibrium.

Self Check Exercise-2

Q1. What is say's law of market?

2.5 Basic Classical Model Formalised

We can formalise the basic classical model by making some simplifying assumptions. We assume that the economy comprises three markets, namely the product market, the labour market and the money market. Secondly, we assume a single final product being produced. Thirdly, we assume only two factors of production, labour and capital. Land may be considered as a form of capital. Having made these assumptions we may start with the analysis of equilibrium in the labour market.

2.5.1 Equilibrium in the Labour Market

We know that equilibrium in a market results from the interaction of the forces of demand and supply. Therefore, in order to analyse the equilibrium in the labour market, we have to enquire into the nature of the demand function for labour as well as the nature of the supply function for labour.

In the classical model, the demand for labour is regarded as the function of the marginal productivity of labour. For the economy as a whole, the marginal productivity of labour, which is the ratio between the increment in the total product (dY) and the increment in the amount of labour employed (dN) with the constant stock of capital, can be denoted as $\frac{dY}{dN}$ where dY is the increment in the total product and dN is the increment in employment of labour from which the former results. Hence the classical demand function for labour can be written as follows:

(1) $N_d = D \ \frac{dY}{dN}$

The classical model assumes diminishing returns to factor proportions. This means that under constant technology and with constant stock of capital, an increase in the employment of labour yields diminishing marginal product $\frac{dY}{dN}$.Since the employers are assumed to be motivated by the desire to maximise profits, they will employ to the extent that the real wage rate $\left(\frac{W}{P}\right)$ equals the marginal product of labour. W is the money wage rates. P is the price level, and hence $\frac{W}{P}$ is the real wage rate. This implies that they will employ a larger work force only at a lower real wage rate. Hence the demand function for labour has a negative slope, that is to say, demand for labour is an inverse function of the real wage rate. In other words, the demand curve for labour slopes downwards towards the right. This is one of the basic classical postulates with respect to wage rates: the real wage rate equals the marginal product of labour. Even Keynes accepted it as valid. Given the operation of the law of diminishing returns, a large demand for labour can thus be associated with only a lower real wage rate which postulate too was accepted by Keynes.

As regards the supply of labour, the classicals tended to explain it with reference to marginal disutility of labour. Supply of labour was assumed to have a real cost in the form of disutility (discomfort, sacrifice of leisure) it involves. This disutility from each successive increment of labour put in by an individual was assumed to go on increasing. In other words, the classicals assumed an increasing marginal disutility of labour which implies that a larger amount of labour would be supplied only at a higher real wage rate. Thus, the classical labour supply function is an increasing function of the real wage rate which can be written as follow:-

(2) $N_a = S \left(\frac{W}{P}\right)$

The market clearing or equilibrium condition is that the demand for labour must equal the supply of labour. Hence, the condition can be written as follows:

(3) $D \left(\frac{dY}{dN}\right) = S \left(\frac{W}{P}\right)$

The equation (3) will give us the equilibrium real wage rate as well as the equilibrium level of employment. At this wage rate of those who are willing to work are able to find employment. Hence the equilibrium employment in the model is also the full-employment level. There may be some unemployed labour at this wage rate. But they are unemployed because this equilibrium wage rate is not acceptable to them. They are thus voluntarily unemployed. Voluntary unemployment is consistent will full employment, though involuntary unemployment is not.

The equilibrium employment, given by equation (3) above, combined with the given and constant stock of capital and technology will yield the equilibrium output (Y) according to the classical production function which has the following form;

(4) $Y = Y\ (N, \bar{K}, \bar{T})$

Y is total product, N is the amount of labour employed, $\bar{K}$ is the given and constant capital stock employed and $\bar{T}$ represents the given constant technology. Since diminishing returns are assumed, the production function will have a concave shape towards the horizontal axis representing employment of labour. The vertical axis will represent the output of the product. If diminishing marginal returns are assumed to operate only after a point upto which there are assumed to be increasing marginal, returns, the product curve or the production function will be convex to the horizontal axis to start with but will become concave after a point when the diminishing returns set in.

The full-employment equilibrium output yielded by equation (4) above will be disposed of completely at the appropriate price level which in the classical model is determined by the quantity of money which can be stated as follows:

(5) $M\bar{V} = PY$

where M is the quantity of money is circulation, V is the velocity of circulation of money which in the classical model is assumed to be contant. M is determined exogenously by the monetary authority. Y is known from equation (4) combined with equation (3). In the classical model any change in the quantity of money has no effect on the real variables of the system like N, Y and $\frac{W}{P}$, though it will influence the monetary variables like P and W. Since Y is the full-employment equilibrium real income which is unique in the classical model and V is also assumed to be constant, any change in the quantity of money (M) will change only the price level in the same direction and in the same proportion in which it itself change. A doubling of M, for example, will lead to a doubling of P and W so that the real wage rate $\frac{W}{P}$ remains the same. Money income (PY) will be doubled but the real income (Y) will not be affected. This shows that the classical model represents real analysis and not monetary analysis. Money in this model is treated only as a "veil" or as neutral, for it does not affect any real variables of the system.

Now, given the real income (Y) from equation (4) in conjunction with equation (3) above, the amount of savings done in the economy is determined by the following classical savings function:

(6) $$S = S\left(\frac{r}{P}, Y.\right)$$

where r is the money rate of interest and P is the price level so that $\frac{r}{P}$ represents the real rate of interest. Y is the level of income. So, in the classical model, savings (S) are the function of the real rate of interest and the level of income and has a positive slope (rising upwards towards the right when the horizontal axis represents savings and the vertical axis represents the real rate of interest and when the level of income is constant.) It is so because saving is assumed to have a real cost in the form of sacrifice of consumption or "waiting".

The full-employment level of savings are fully invested in the classical model through appropriate changes in the real rate of interest which also determines volume of investment. The classical investment function is :

(7) $$I = I\left(\frac{r}{P}\right)$$

The market clearing or equilibrium condition in the loanable funds or money market is :

(8) $$S\left(\frac{r}{P}.Y\right) = I\left(\frac{r}{P}\right)$$

which gives the equilibrium real rate of interest which would equate the full-employment level of savings with investment. In this case too any change in M will change the money rate of interest (r) in the same direction and in the same proportion as the money changes. But the real rate of interest $\left(\frac{r}{P}\right)$ will remain unaffected by changes in the quantity of money which again points towards the real analysis of the classical model.

It should be noted that the classical theory of interest is a 'real' theory rather than a monetary theory. Therefore it may be disputed that the set of equations (6) to (8) represent the money market in the strict sense. It can, in that case, be described as the financial market. In a monetised economy savings are supplied on the financial market in the form of money as loanable funds which are borrowed by investors in money form. The market for loanable funds is the money market in that sense.

Secondly, we did not comment upon the nature of the investment demand (for loanable funds) function of equation (7) above. This function too has a negative slope like the labour demand function of equation (1). Investment is addition made to capital stock which too is assumed to be subject to the law of diminishing or eventually diminishing marginal returns.

We have not gone into too many details regarding the derivation of the aggregate demand function or curve of labour and the aggregate supply function or curve of labour on the presumption that you have already learnt it in your first semester course in the context of the theory of wage determination.

Self Check Exercise-3

Q1. What is Basic Classical Model ? also discuss equilibrium in the Labour Market.

2.6 A Diagramatic Illustration of the Basic Classical Model)

In this section we shall try to explain the basic features of the classical model of income determination as formalised in a set of equations (1) to (8) in the pre- ceding section with the help of a set of diagrams.

Fig. 2.1 below represents the labour market, D $\left(\frac{dY}{dN}\right)$ is the aggregate demand curve of labour behind which lies the diminishing marginal product of labour $\left(\frac{dY}{dN}\right)$ as explained in the preceding section.

S $\left(\frac{W}{P}\right)$ is the aggregate supply curve of labour showing labour supply to be the increasing function of the real wage rate $\left(\frac{W}{P}\right)$. W is the money wage rate and P is the price level. The market equilibrium condition, D $\left(\frac{dY}{dN}\right)$ = S $\left(\frac{W}{P}\right)$, is satisfied at the point of intersection (E) of the demand and the supply curve of Labour. This point of equilibrium gives us the equilibrium employment N_0 as well as the equilibrium real wage rate $\left(\frac{W}{P}\right)_0$

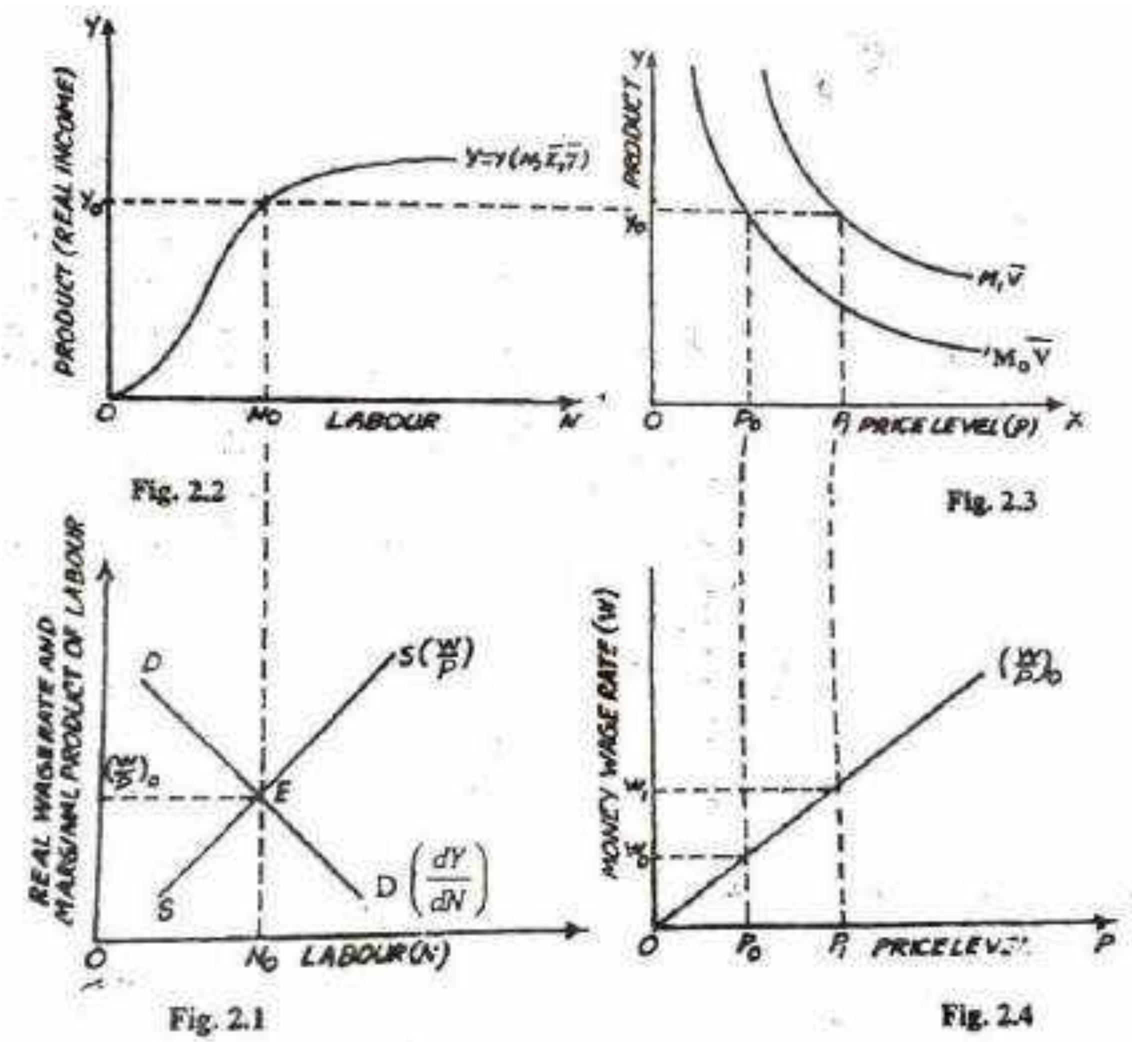


Fig. 2.2 above represents the production function of the economy indicating how the product changes with changing quantity of labour employed with a constant quantity of capital stock under a given and constant technology. The equilibrium employment being N_0 the product curve $Y = Y(N, \overline{K}, \overline{T})$, of Fig. 2.2 gives us the equilibrium level of output which is Y_0.

It should be noted that in Fig. 2.1 the equilibrium point E lies on the supply curve of labour which implies W that at the equilibrium wage rate $\left(\frac{W}{P}\right)_0$ all those who are willing to work at this wage rate are able to find employment. Hence it represents full-employment equilibrium. And, therefore, Y_0 represents full-employment level of product or real income.

Let us suppose that the total quantity of money is M_0. Velocity of circulation of money is assumed to be constant in the classical quantity theory of money. Therefore, as long as the quantity of money in circulation does not change from M_0 the product $M_0 \overline{V}$ will remain constant. We know it from the classical equation of exchange that MV = PY. Therefore, in our case PY will also be constant as $M_0 \bar{V}$ is constant. Thus the curve $M_0 \bar{V}$ of Fig. 2.3 below which relates the two variables, P and Y, of our model will be a rectangular hyperbola ($PY = M_0 \bar{V}$ = constant). Now we know the equilibrium level of income to be Y_0 from fig. 2.2. The $M_0 \bar{V}$ curve of Fig. 2.3 tells us that Y_0 level of real income is associated with P_0 level of prices when the quantity of money in circulation is M_0. Hence the equilibrium price level is P_0.

In Fig. 2.4 a straight line with its slope equalling the equilibrium real wage rate $\left(\frac{W}{P}\right)_0$ is drawn passing through the origin. The horizontal axis of the Fig. represents the price level (P) and the vertical axis represents the money wage rate (W). Therefore the slope of such a line, $\frac{W}{P}$, represents the real wage rate when it passes through the origin. Such a straight line has a constant slope throughout. Thus the straight line $\left(\frac{W}{P}\right)_0$ of our Fig. 2.4 shows constant real wage rate equalling the wage rate $\left(\frac{W}{P}\right)_0$ of our model. Now, we already know from our Fig. 2.3 that when the quantity of money in circulation of M_0, the equilibrium price level is P_0 Fig. 2.4 tells us that equilibrium price level P_0 is associated with money wage rate W_0. Hence, with quantity of money. M_0, the equilibrium money wage rate is W_0.

Fig. 2.5 represents the market for loanable funds which in the classical theory of the rate of interest are assumed to come from saving only. $S\left(\frac{r}{P}, Y_0\right)$ is the supply function of loanable funds or savings when the equilibrium level of income is Y_0. It has a positive slope or saving is assumed to have a real cost which goes on increasing with every addition to saving. Alternatively, it may be assumed, following Fisher, to depend on the individuals' rate of time preference which goes on increasing as they have less and less of present consumption when they go on increasing their savings out of given income. Hence a larger volume of savings is associated with a higher rate of real rate of interest which explains the positive slope of the saving function. $1\left(\frac{r}{P}\right)$ is the investment demand function for loanable funds or savings. It has a negative slope because behind it lies the diminishing marginal product of capital. The market clearing or equilibrium condition $S\left(\frac{r}{P}, Y_0\right) = I\left(\frac{r}{P}\right)$, in our example is met at point E so that the full employment level of savings and investment are Q_0 and the full-employment equilibrium real rate of interest is $\left(\frac{r}{P}\right)_0$.

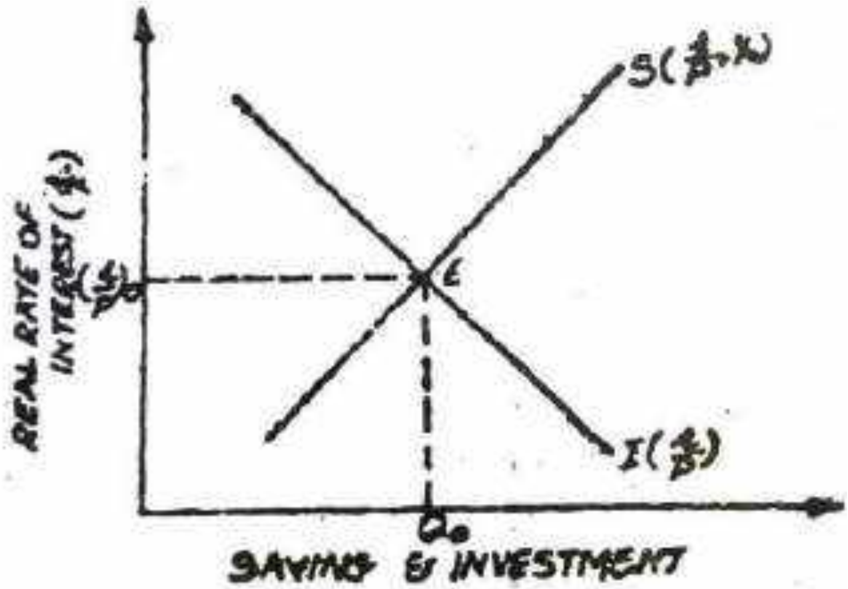


Fig. 2.5

If we draw another diagram like that in Fig. 2.4 above, drawing a straight line passing through the origin and with its slope equalling the equilibrium real rate of interest $\left(\frac{r}{P}\right)_0$, when price level is represented along the horizontal axis and the money rate of interest (r) along the vertical axis, we can find the equilibrium money rate of interest.

The above geometrical model can be easily used to demonstrate that in classical model money is neutral, having no effect on the real variables of the system such as employment, level of real income, real wage rate and real rate of interest. All real variables are determined by real factors such as labour supply, production function, savings and investment, etc. Suppose the quantity of money is doubled from M_0 to $M_1 = 2M_0$. As a result of it, there will be no change in the real parts of the above model as depiced in Figs. 2.1, 2.2 and 2.5. Only the monetary parts (Figs. 2.3 and 2.4) or monetary variables such as P, W and r will change. The $M_0 \bar{V}$ curve will shift outward to the position $M_1 \bar{V}$ giving a new equilibrium price level $P_1 = 2P_0$. Doubling of M doubles P. Fig. 2.4 shows that the new equilibrium money wage rate will also double to $W_1 = 2W_0$ Similarly, the money rate of interest will also double. But the real variables, N_0, $\frac{W}{P}$, Y_0 and $\frac{r}{P}$ will remain unaffected.

On the other hand, if there is some change in a real variable, it would affect other real variables as well as the monetary variables. Suppose there is increase in population leading to eventual increase in labour supply. This will shift the labour supply function, $S\left(\frac{W}{P}\right)$, in Fig. 2.1

to the right. The new equilibrium will take place at a lower real wage rate and a higher level of employment which, in turn, will determine a new and higher equilibrium level of real income. If the quantity of money remains the same (M_0), it will be associated with a lower price level in Fig. 2.3. A lower price level and a lower real wage rate will combine to give an equilibrium money wage rate which would fall more than the fall in the price level. The straight line $\left(\frac{W}{P}\right)_0$ of Fig. 2.4 will rotate downwards at the origin to have a lower slope equalling new lower equilibrium real wage rate. Similarly, the money rate of interest will also fall. The saving function, $S\left(\frac{r}{P}, Y\right)$ will shift to the right as the new equilibrium level of income is higher. Thus the real rate of interest, $\left(\frac{r}{P}\right)$, will also fall.

The above illustration clearly demonstrates that the classical analysis is real analysis. In the classical model money is looked upon only as a "veil" behind which le the real factors. Money is thus neutral in the classical model.

Self Check Exercise-4

Q1. Diagramatically discuss Basic Classical Model.

2.7 Summary

In its simplest form, the determination of output and employment in classical theory occurs in labour goods and Money Market of the economy. In the Labour Market, the demand of labour and the supply of labour determines the level of employment in the economy. Both are functions of the real wage rate. It is the point of intersection of the demand and supply curves of laobour which determine the equilibrium wage rate and the level of full employment. The total output, in turn, depends upon the level of employment given the capital stock and technological knowledge. It is shown by the production function which relates total output to level of full employment.

2.8 Glossary

The classical economists had overlooked an important point in their argument according to which to remove unemployment in the system, real wage should be reduced. They forgot that a general wage cut, while it reduces the firms' Marginal cost will also reduce factor incomes and consequently the total market demand for the product. Thus as a result of general wage-cut the aggregate supply curve shifts to the right, the output (and consequently employment) could increase only if the aggregate demand curve did not shift leftward. Unfortunately the same wage cut which shifts the supply curve to the right will also shift the demand curve to the left leaving output and unemployment unchanged. Moreover, if the demand curve shifts to the left more than the right ward shift in the supply curve, the aggregate output and employment may even fall rather than rise consequent upon a general money wage cut.

2.9 Answer to self check exercises

Self Check exercise -1

Ans.1. Refer to Section 2.3

Self Check exercise -2

Ans.1. Refer to Section 2.4

Self Check exercise -3

Ans.1. Refer to Section 2.5 and 2.5.1

Self Check exercise -4

Ans.1. Refer to Section 2.6

2.10 References/ Suggested Readings

1. E. Shapiro Macroeconomic Analysis, Ch. 14.
2. A.H. Hansen, Guide to Keynes, Ch. 1
3. G. Ackley, Macroeconomic Theory Ch. V to VIII
4. W.H. Branson, Macroeconomic Theory and Policy, Ch. 6
5. Mark Blang, Economic Theory in Retrospect, Chapter on Says' Law.

2.11 Terminal Questions

Q. 1 Explain the features and scope of the classical theory.

Q. 2 Critically examine the classical theory of full employment.

*****

Unit - 3

THE BASIC KEYNESIAN MODEL

Structure

3.1 Introduction

The Logical starting point of Keynes's theory of employment is the principle of effective demand in a capitalist economy the level of employment depends on effective demand. Thus unemployment results from a deficiency of effective demand and the level of employment can be raised by increasing the level of effective demand.

3.2 Learning Objectives

After going through this Chapter you will be able:

- To understand the meaning of effective demand
- To understand the basic Keynesian Model

3.3 Meaning of Effective Demand

For a lay man, demand means desire. It becomes effective when income is spent in buying consumption goods and investment goods. Keynes used the term effective demand to denote the total demand for goods and services at various levels of employment. different levels of employment represent different levels of aggregate demand. But there can be a level of employment where aggregate demand equals aggregate supply. This is the point of effective demand. According to Keynes, the level of employment is determined by effective demand which, in turn, is determined by aggregate demand price and aggregate supply price.

Self Check Exercise-1

Q1. What is the meaning of effective demand?

3.4 The Keynesian Model

We looked at the salient features of the classical macromodel in our last lesson. In the present lesson we shall consider the broad features of the Keynesian model. However, before we proceed to expound Keynes's model of the determination of income and employment, it will be useful to consider Keynes's attack on the classical theory and the flaws in the classical argument as they appeared to Keynes and which impelled him to attempt the substitution of the classical approach with his own approach, now known as the Keynesian approach.

If you have followed the previous lesson, it should not be difficult for you to realise that the Kingpin of the classical model is the assumption of perfect flexibility of prices. (upward as well as downward) inclusive of the factor prices. An easy way of attacking the classical model. Which arrives at the conclusion that a freely competitive economic system has an inherent tendency to reach equilibrium at full employment level, is to say that the basic assumption flexibility of prices would not be satisfied in the modern world. It may be argued that the prices in the modern world are not flexible, particularly in the downward direction. Wages rates, even in situations of widespread unemployment, cannot be cut down because of the resistance of the trade unions or due to the legal restrictions imposed by the minimum wage laws. Monopolies of various degrees may be found in the product markets o. These usually have the effect of pegging the prices despite the deficiency of aggregate demand. Look at Fig. 3.1 D $\left\{\frac{W}{P}\right\}$ is the classical demand function for labour, which is negatively sloped, because behind it lies the diminishing marginal productivity of labour. $\frac{W}{P}$ represents the real wage rate which equals money wage rate (W) divided by the price level (P). S $\left(\frac{W}{P}\right)$ is the labour supply function of classical model which is positively sloped, because behind it lies the increasing marginal disutility of labour. If the real wage rate is perfectly flexible, as it is assumed in the classical model, the equilibrium wage rate will be $\left(\frac{W}{P}\right)_0$ in Fig.1 above. At this wage, all those who are willing to work are employed. Hence, there is no involuntary unemployment. This is the classical position.

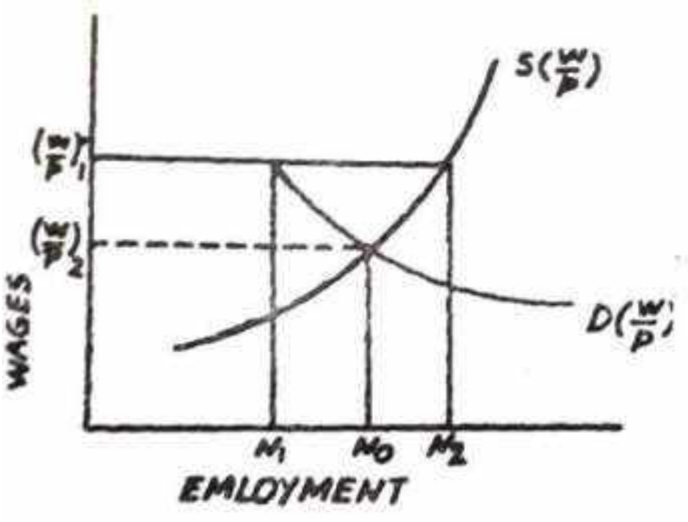


Fig. 3.1

Now let us suppose that the wage rate is $\left(\frac{W}{P}\right)_1$ at which ON_2 workers are writing to work but only ON_1 of them can be employed. There is, then, an involuntary unemployment equalling N_1N_2. There is excess supply in the labour market. Under the classical assumption of flexibility of wage rates, $\left(\frac{W}{P}\right)_1$ cannot be the equilibrium rate. Excess of labour supply will reduce the wage rate to $\left(\frac{W}{P}\right)_0$ at which labour supplied and labour demanded are equal, and, consequently, there is no involuntary unemployment or, in other words, there is full employment. However, if the wage rate is fixed at $\left(\frac{W}{P}\right)_1$ by the action of the trade unions or by the minimum wage legislation, it becomes rigid downwards. Consequently, the situation of excess, supply of labour or involuntary unemployment will persist and will not be corrected. Thus, it may be contented that the classical model is not valid in a modern economy.

Similarly, a situation of excess supply in the product market or, which is the same thing, a situation of excess demand in the money market may not be corrected, if the product prices are rigid rather than flexible, in the downward direction due to their being pegged by the monopolies.

A moment's consideration will show that the above is no criticism of the classical model as far as its logic goes. The classical model is not at all intended to be valid in an economy characterised by rigidity of wages and prices. Confronted with such a situation, the classicals would have suggested the liquidation of trade unions as well as monopolies and doing away with minimum wage legislation and, instead, adopting of a laissez-faire policy.

Similarly, to say that, in the modern world, the act of saving is divorced from the act of investment, as a consequence of which desired saving out of full-employment income may not equal the desired investment at that level of income, is no genuine criticism of the classical model. It is true that the classical model implies what is described as the 'Saving is spending "theorem. Say's Identity implied that whatever was saved was automatically invested (Refer to Ricando's statement of Say's Law given in the preceding lesson). However, Say's Equality suggested the mechanism through which the desired saving was brought in equality with desired investment at full employment even when saving was done by one set of people and investment by another set of people. The classical monetary theory too suggested this mechanism, which is no other than the flexibility of the rate of interest. If the rate of interest is flexible up- ward as well as downward, the equality of saving and investment is ensured.

This implies that given the assumptions of the classical model, the classical conclusions follow logically: that the logic of the classical model is complete.

But Keynes had questioned even the logical completeness of the classical model. Many economists at present seem to agree that Keynes was unjustified in criticising the classical model as logically incomplete.

Keynes's more fundamental criticism is that the classicals neglected the aggregate demand as an determinant of the level of employment. The classical model implied that, if there was unemployment, it must be due to the refusal of workers to accept a wage rate which equaled their marginal productivity. Keynes denied this proposition and, instead, held that unemployment was due to the insufficiency of aggregate demand. While the classicals seemed to argue that marginal productivity of labour determined the wage rate which, in turn, determined the level of employment, Keynes, on the other hand, argued that the level of aggregate effective demand determined the level of employment; the level of employment determined the marginal productivity of labour which, in turn, determined the wage rate.

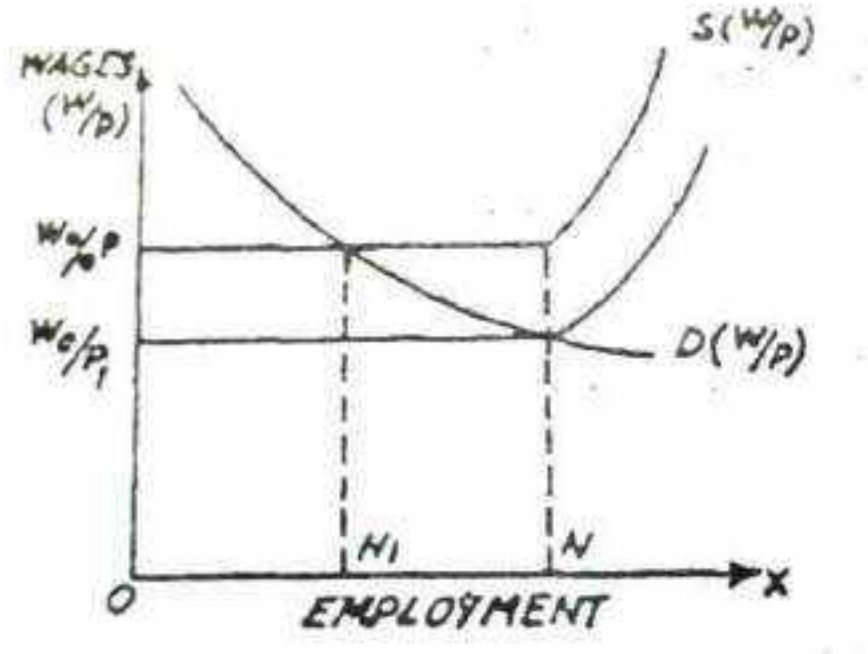


Fig. 3.2

The classical model also postulated that (i) workers will refuse the offer of employment, if the real wage rate was cut below the current rate; and (ii) a cut in money wage rate was an effective means of reducing the real wage rate. Both of these propositions are implied in the statement that the current real wage rate equals the marginal disutility of labour. Keynes rejected this postulate of the classical theory. On the other hand, he postulated that under conditions of under-employment, the current real wage rate is greater than the marginal disutility of labour. However, the workers will accept a cut in real wage rate, provided it was not brought about through a cut in money wage rate which the workers, in his opinion, would refuse to accept. Thus, Keynes's view that the workers suffer from "money illusion" with respect to their labour supply function; that is to say, the workers while deciding to allocate their time between leisure and work, are guided by the money wage rate and not by the real wage rate. Provided the money wage rate is not reduced, employment can be increased and the real wage rate reduced through increase in aggregate demand and accompanying rise in the price level. The Keynesian labour-supply function will look like the S $\left(\frac{w}{P}\right)$ functions in the Fig. 3.2 On represents full employment. Till this level is attained the labour-supply function is horizontal. But after full employment (ON), this function takes on the classical shape that is, it becomes positively sloped.. Keynes denied the classical proposition that a cut in money wage rate was an effective means of reducing the real wage rate and, thus, of increasing employment. He seemed to argue that an increase in aggregate demand would increase employment and prices, and the latter would cause the real wage rate to fall. His argument was that a cut in money wage rate was double-edged it reduced not only the money wage rate but also the aggregate demand, since wage share is a substantial proportion of the national income. The fall in the aggregate demand will shift the D $\left(\frac{w}{P}\right)$ function downwards, thus aggravating involuntary employment instead of remedying it. His argument further implied that with falling aggregate demand the price level would fall, and if this fall was proportionately more than the fall in the money wage rate, the real wage rate, instead of falling. would rise, and, hence not more but less employment would be offered. Instead, he recommended an increase in aggregate demand to cure involuntary unemployment. Look at Fig. 3.2 above. If W_0 and P_0 are the initial money wage rate and price level respectively, the demand function for labour D $\left(\frac{w}{P}\right)$ in such that the wage rate $\frac{W_0}{P_0}$ only ON_1 amount of labour can be employed so that N_1 N is the amount of involuntary unemployment. Now with increase in aggregate demand and the consequent rise in price level from P_0, the real wage rate will fall to $\frac{W_0}{P_1}$.The Keynesian labour supply function will now shift down as shown in the figure. It is likely that with increase in aggregate demand, the demand, the demand function for labour, D $\frac{W}{P}$, may also shift to the right. But even if it stays where it is, full employment will be attained and involuntary unemployment re- moved, as the shifted labour supply function cuts the labour demand function at the full employment level ON.

It should be noted that the above argument of Keynes is not flawless. While criticising the classical view that a cut in money wage rate is an appropriate policy prescription for curing involuntary unemployment, he forgot to take into account the substitution effect of a fall in wage rate. If the elasticity of demand for labour is substantially high, the labour demand function may shift to the right to cut the labour supply function at the full-employment level.

A condition of full-employment equilibrium is that the desired saving at full employment must equal the desired investment at that level. You may recall that the classical model implied that this equality is brought about through the rate of interest. But Keynes critised this classical proposition too. His contention was that the equality between saving and investment was brought about not through changes in the rate of interest but through changes in the level of income. Furthermore, even if it is assumed that saving and investment are both functions of the rate of interest, the interest-elasticity of the investment function might be such that it might

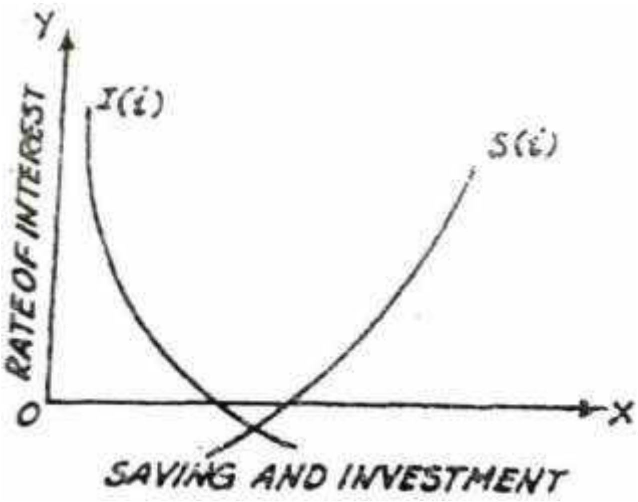


Fig. 3.3

cut the saving function below the X-axis, as shown in Fig. 3.3 which would imply a negative rate of interest. Since a negative rate of interest is impossible, because there are neglible costs of storing money, the full employment equilibrium between saving and investment might not come about through, the interest rate mechanism suggested in the classical model. The defenders of the classical model have an answer to that. But we shall not get into further details of this controversy at this preliminary stage and shall postpone it to a later lesson in which we shall examine in depth the relation between price flexibility and full employment. We shall now proceed to delineate the outline of Keynes's own model of the determination of output and employment.

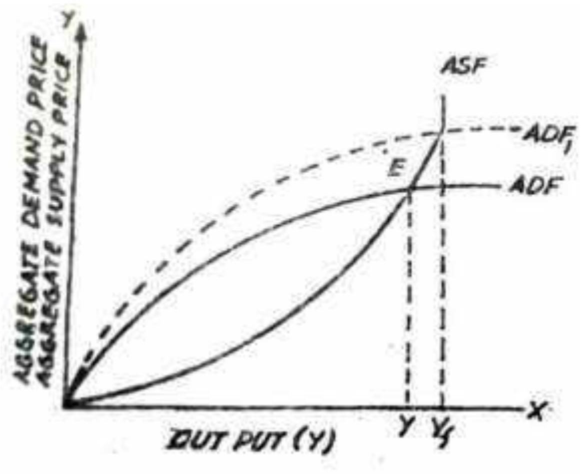


Fig. 3.4

The fundamental departure made by Keynes from the classical model was to highlight the role of aggregates demand in the determination of output and employment. In the

Keynesian model the level of output and employment is determined not by the productivity factor but by the level of the aggregate effective demand. The productive capacity of the system sets only the ceiling to the level of output.

Keynes made use of the Marshallian tools of demand and supply analysis to expound his proposition. It is the interaction of the aggregate demand function and the aggregate supply function which determines the equilibrium level of output. The aggregate demand function is a schedule, which relates the different levels of output to the total revenue proceeds expected to be received by all the firms taken together through the sale of each level of output. Since revenue is only the obverse of expenditure, the expected aggregate revenue from the sale of a given output must equal the expected expenditure by the community on the output.

It is assumed that the aggregate demand function is concave to the output axis Ox like ADF in Fig. 3.4. The aggregate of expenditure of an economy equals the sum of its consumption expenditure and investment expenditure. In the simple Keynesian model investment expenditure (I) is assumed to be independent of the level of output or income (Y). But consumption expenditure is a function of the level of output oririncome (Y). The Keynesian assumption, which is grounded in the so- called Psychological Law, is that the rate, at which consumption expenditure (C) increases, goes on diminishing with a rise in the level of income. This explains the concavity assumption of the aggregate demand function (ADF).

The aggregate supply function (ASF) is the schedule which relates the different levels of output to them respective amounts of money income that all the firms taken together must receive, if these levels of output are to be worth their while to produce. The aggregate supply price of a given output equals the cost of producing that output. The locus of the supply prices of all the possible levels of output is the aggregate supply function. It is assumed to be positively sloped and convex to the output axis. This particular shape of the ASF is grounded in technology. An increase in output implies increased total costs which must be recovered if the increased output is to be worthwhile for the producers to produce. So ASF is positively sloped. Convexity of ASF only implies increasing marginal cost of producing output. This implies that due to technological considerations economy is operating under diminishing returns. The position of ASF also depends on technology. An improvement in technology will shift ASF downwards. But technology can change only in the long period, and since Keynes's concern was with the short period, ASF is assumed to be d fixed. But ADF is not fixed, because it refers to expected t aggregate demand (or expenditure) in the economy. If the actual aggregate demand of the economy turns out to be less than expected the producers' expectations will be revised and the ADF will shift downwards. It will be revised upwards, if the actual aggregate demand turns out to be greater than the expected. Through such revision the ADF may ultimately take a position which is borne out by the actual demand conditions. The relevant ADF is thus one which is borne out by actual demand conditions.

The point at which ADF and ASF intersect (at E in our diagram) is the point of equilibrium. The equilibrium output of the economy is OY. The full-employment output is OY_0 at which the ASF becomes vertical. Thus, within the Keynesian model, equilibrium is shown to be possible at less than full employment level of output. If the ADF function had been sufficiently high to take the position ADF_1, equilibrium would have taken place at the full-employment level of output y_1. Thus, Keynes tried to show that the classical case, where equilibrium takes place only at full-employment level of output, is only the limiting case.

The aggregate demand at the point of intersection between ADF and ASF is referred to as the aggregate effective demand; it is the aggregate demand that is actually realised and thus becomes effective. It is the level of such an aggregate effective demand that deter mines the level of output in Keynesian model.

Aggregate output of an economy generates income equal to the cost of producing that output. It is this amount which in described as the aggregate supply price of a given output. Let us denote this income as Y. The aggregate demand at any given level of output or income is the total expenditure on consumption goods (C) and investment goods (1) at that level of income. Therefore, equality between aggregate demand and aggregate sup- ply, as a condition of equilibrium may also be expressed as Y= C +1. Since Y also equals C+S (i.e. savings), this condition can also be expressed as S+I. But savings and investment here refer to desired savings and desired in- vestment. In the Keynesian model desired savings are a function not of the rate of interest but of the level of at income. So the Keynesian saving function can be written as: S=S (Y). Similarly, desired investment (I) can also be expressed as a function of the level of income, though in a simple type of Keynesian model it is assumed to be autonomous. Therefore, the Keynesian investment function may be written as: I=I (Y). The Keynesian condition of the determination of the level of output or income is thus transformed into S (Y) =I (Y).

The condition S(Y) = I(Y) determines the level of output or income. Given this level of output (Y), the equilibrium level of employment can be found out from the production function: Y = f (N, $\overline{K}$) where $\overline{K}$ denotes fixed capital stock. Given the equilibrium level of employment (N), the real wage rate is determined by the profit-maximisation equation : $\left(\frac{w}{P}\right)$ = dY/dN, where $\left(\frac{w}{P}\right)$ is the real wage rate and dY/dN is the marginal productivity of labour.

Here you can see some important points of difference between the classical model and the Keynesian model. In the classical model, savings and investment are the functions of the rate of interest so that equality between savings and investment, which is a condition of equilibrium, is brought about through changes in the rate of interest. In the Keynesian model savings and investment are the functions of the level of income and the equality between savings and investment is established through changes in the level of income. The condition of equality between savings and investment determines the equilibrium rate of interest in the classical model. But, in the Keynesian model, this condition determines the equilibrium level of output or income. In the Keynesian model the rate of interest is not a real phenomenon, as it is in the classical model, but is a monetary phenomenon: It is determined in the money market by the condition, M-L (Y, i), where M is the autonomously determined supply of money, and L(Y, i) is the demand function for money, as demand for money depends on Y and the rate of interest (i). Another point of difference between the classical and Keynesian models is with respect to sequence. In the classical model the sequence is: Equilibrium employment and equilibrium wage rate are determined in the labour market. The equilibrium employment determines output through the production function. In the Keynesian model this sequence is revered: the aggregate effective demand determines the level of output; the level of output, in conjunction with the production function, determines the equilibrium level of employment, which may or may not be the full-employment level and equilibrium level of employment, in conjunction with the profit-maximisation equation ($\frac{w}{P}$ = dy/dN determines the real wage rate $\left(\frac{w}{P}\right)$ as well as the marginal productivity, of labour (dY/dN).

Furthermore, underemployment equilibrium is possible-indeed, it is implied to be more common-in the Keynesian model; but the classical model rules it out. Under-employment equilibrium implies that at the equilibrium wage rate [n where D $\left(\frac{w}{P}\right)$ = S (w/p)] labour employment is less than the number willing to work at this wage rate: This can happen only if the labour supply function. S (W/P), is horizontal over a certain range. Thus the strict Keynesian model replaces the classical labour-supply function, N,-S (WIP), with N-S (W), where W is the money wage rate. This obviously implies "money illusion" in the labour supply function-an assumption which Keynes tried to defend with the argument that wage bargains in real world are made not in real terms but in monetary terms. Besides, his model implied that the labour-supply function, N, =S (W), is infinitely elastic that is, horizontal upto the full-employment point.

We can now formalise the Keynesian model through the following set of equation:

(1) D(Y) = Z(Y) determines output.

D(Y) is the aggregate demand function,

and Z(Y) is the aggregate supply function. Alternatively, the condition (1) may be expressed as

(I. i) S (Y) = I(Y)

Given the equilibrium output by (I) or (i, i), the equilibrium employment is given by the production function:

(2) Y = Y (N, $\overline{K}$)

Given the equilibrium employment, the profit maximisation equation gives the equilibrium wage rate (real) as well as the marginal productivity of labour:

(3) $\frac{W}{P} = \frac{dY}{dN}$

Keynes agreed with the classical postulate that an increase in employment is possible only with a fall in the real wage rate, which is implicit in the above equation (3), when we remember that the Keynesian as well as the classical labour-demand function.

(4) $N_d = D\left(\frac{dY}{dN}\right)$ is negatively sloped due to the assumption of diminishing returns.

Since Keynes did not agree with the classical proposition that a cut in money wage rate was the appropriate policy for decreasing real wage rate and, thus, increasing employment, his labour-supply function is based on the assumption of 'money illusion' Hence, Keynes's model implies that the labour supply is a function of money wages:

(5) $N_1 = S(W)$ with infinite elasticity upto the level of full employment.

Given the equilibrium level of income, the rate of interest is determined not in the real (product) market but in the money market by the following condition:

(6) $M = L(l, Y)$

where M is the supply of money, which is autonomously determined by the banking system, and L (i,) is the liquidity preference or the demand function for money.

The above model written in mathematical language can be translated into geometric (diagramatic) form as follow:-

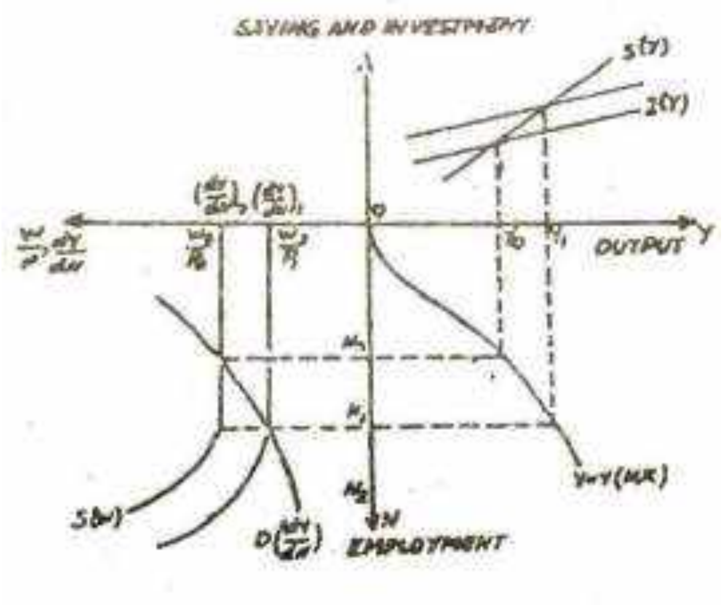


Fig. 3.5

In the north-east quadrant of the above diagram we derive equilibrium output Y_0 by the conditions, $S(Y) = I(Y)$, the equation (I-i) of the above set of equations. In the south-east quadrant we have the production function $Y = Y(N, K)$. The equilibrium, output Y_0 on it is associated with N_0 employment. So N_0 is the equilibrium employment. N_1 represents full-employment level. Therefore this is a case of under-employment or less- than-full employment equilibrium. The south-west quadrant shows the labour demand function $N_d = D\left(\frac{dY}{dN}\right)$, behind which lies the diminishing $\frac{dY}{dN}$, that is, marginal productivity of labour. No employment determines the marginal productivity of labour in equilibrium position which is $\left(\frac{dY}{dN}\right)_0$ in this case. Since it is a case of less-than-full employment equilibrium. The labour-demand function intersects the labour-supply function N_1 = S (W), where W is the money wage rate, in its horizontal portion where the labour supply is perfectly elastic. Thus the real wage rate $\frac{W_0}{P_0}$ equals marginal productivity of labour $\left(\frac{dY}{dN}\right)_0$.

The rate of interest is determines in the money market by the appropriate liquidity preference schedule linked to the particular equilibrium level of output or income in conjunction with the given exogenously deter mined money supply as shown in the following diagram of Fig. 3.6.

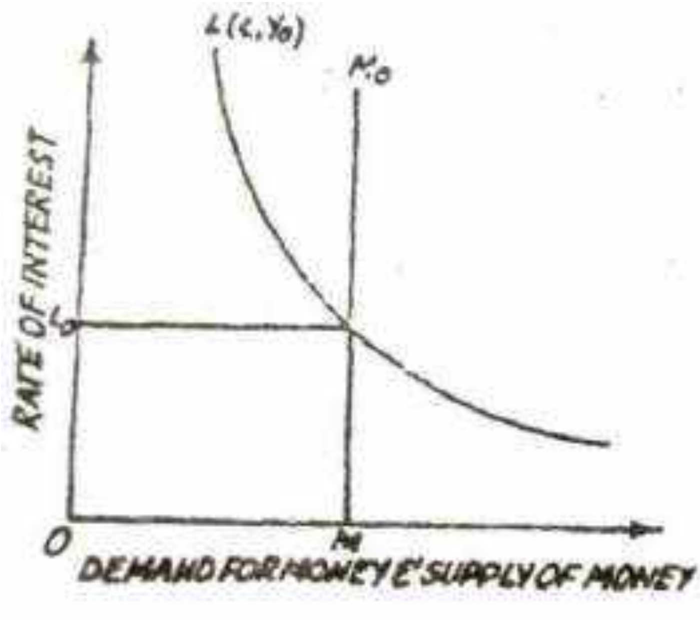


Fig. 3.6

In the following Fig. 3.6 the negatively sloping L (i, Y_0) curve is the liquidity preference curve when level of output is Y_0. The given money supply which is independent of the rate of interest is M_0. The equilibrium rate of interest determined by the equation, M = L (i,Y) is i_0.

The basic proposition of Keynes's model is depicted in the north-east quadrant of Fig. 3.5 above and Fig. 3.4 above. It states the basic principle of income determination in his model. This is the principle of aggregate effective demand which states the condition of equilibrium in the product market as Y = E = C(Y) + 1 or alternatively as S(Y) = I, when there is no government sector and investment is autonomous. If the investment is induced investment depending on Y, the latter condition, becomes S(Y) = I(Y) as shown in the north-east quadrant of Fig. 3.5. An autonomous increase in investment will shift upwards the I(Y) function which gives a new equilibrium output Y, which gives new equilibrium employment N_1. The economy is still in under-employment equilibrium. So the labour demand function continues to intersect labour supply function in its horizontal part but the labour supply function shifts downwards as with increase in aggregate demand and output price level rises to P, but the money wage rate remains constant at W_0. $\frac{W_0}{P_1}$ represents lower $\frac{dY}{dN}$ at $\left(\frac{dY}{dN}\right)_1$ associated with larger employment N_1. The increase in output from Y_0 to Y_1 takes place through the multiplier process.

The Keynesian multiplier can be derived as follows for autonomous investment.

(1) Y = C + I Accounting Identity.

(2) C = a + iY.

Putting (2) into (1):

(3) Y = a + cY + I

Rearranging (3):

(4) $Y(1-C) = a + \bar{1}$

or (5) $Y = \frac{1}{1-c}(a+1)$

which means autonomous investment (1) and autonomous consumption (a) are subject to the multiplier effect equalling $\frac{1}{1-c}$ where c is marginal propensity to consume. Any autonomous change in investment (Δ *I*) will increase income by Δ *I*. $\frac{1}{1-c}$ Δ I. $\frac{1}{s}$ where s is marginal propensity to save. Thus $\frac{1}{1-c}$ or $\frac{1}{s}$ is the raultiplier.

Self Check Exercise-2

Q1. Diagramatically discuss the Keynesian Model.

3.5 Summary

We have given above only the outline of the Keynesian model trying at the same time to highlight some of the essential differences between it and the classical model. In subsequent lessons we shall have the occasion to elaborate upon the individual parts of the Keynesian model as well as to examine them critically.

3.6 Glossary

The Principle of effective demand repudiates say's law of market that supply creates its own demand and that full employment equilibrium is a normal situation in the economy. This principle points out that under employment equilibrium is a normal situation and full employment equilibrium is accidental. In a capitalistic economy supply fails to create its own demand because the whole of the earned income is not spent on the consumption of goods and services. Moreover, the decisions to save and invest are made by different people. As a result, the existence of full employment is not a possibility and the point of effective demand at any time represents under employment equilibrium.

3.7 Answer to self check exercises

Self Check exercise -1

Ans.1. Refer to Section 3.3

Self Check exercise -2

Ans.1. Refer to Section 3.4

3.8 References/ Suggested Readings

1. J.M. Keynes, The General Theory of Employment, Interest and Money, Ch. 1-5. '15,19
2. A.H. Hansen, Guide to Keynes, Ch. 1
3. G. Ackley, Macroeconomic Theory, Ch. 14.15
4. Demberg and Mcdougall, Macroeconomics, Ch. II
5. E. Shapiro, Macroeconomic Analysis, Ch. 4 to 7

3.9 Terminal Questions

Q. 1 Keynesian Theory of effective demand is the heart of Modern Macroeconomic analysis. Discuss.

Q. 2 Describe the basic Keynesian model of income and employment.

*****

Unit - 4

EQUILIBRIUM IN PRODUCT AND MONEY MARKETS

Structure

4.1 Introduction

Keynes's model suffered from a dichnotomy. He split what is a single intergrated economic system into two parts, the product market and the money market. In his model the real income is determined in the product market in which, as Harry G. Johnson pointed out, rate of interest enters exogenously. The rate of interest, on the other hand, is determined in the money market where the level of income enters exogenosuly. On account of this Keyres's model was indeterminate, because the equilibrium level of real income could not be known unless we knew the equilibrium rate of interest, and the equilibrium rate of interest could not be known unless we knew the equilibrium level of income.

Prof. Hicks was the first to point out the shortcoming of Keynes's analysis in his now famous paper, "Mr. Keynes and the Classics," published in 1937, and he also suggested the way out from this problem of indeterminateness. The equilibrium in the product market and the money market takes places simultaneously. How it comes about is explained hereunder following the analysis of Hicks and Hansen.

4.2 Learning Objectives

After going through this chapter you will be able:

- To know the Equilibrium in Product market.
- To know the Equilibrium in Money market.
- To understand the fiscal policy effects
- To understand the monetary policy effects

4.3 Equilibrium In the Product Market

We pointed out in the preceding lesson on the basic Keynesian model of income determination that there are two alternative ways of stating the equilibrium condition for the product market. One way is to state that equilibrium in the product market is determined by the condition that the aggregate demand function, D(Y), equals the aggregate supply function, Z (Y). Since aggregate demand is composed of consumption expenditure and investment expenditure in an economy having no government sector and income received is either consumed or saved, it means that any level of income will be an equilibrium level only if the income which the people desire to save out of that level of income equals the investment which the entrepreneurs desire to make at that level of income. Hence the alternative condition of equilibrium in the product market can be stated as follows:

$$S(Y, i) = I(i)$$

where investment, (I) is assumed to be a function of the rate of interest while, following the classicals as well as the neoclassicals, saving may be assumed to be a function of both, the level of income and the rate of interest.

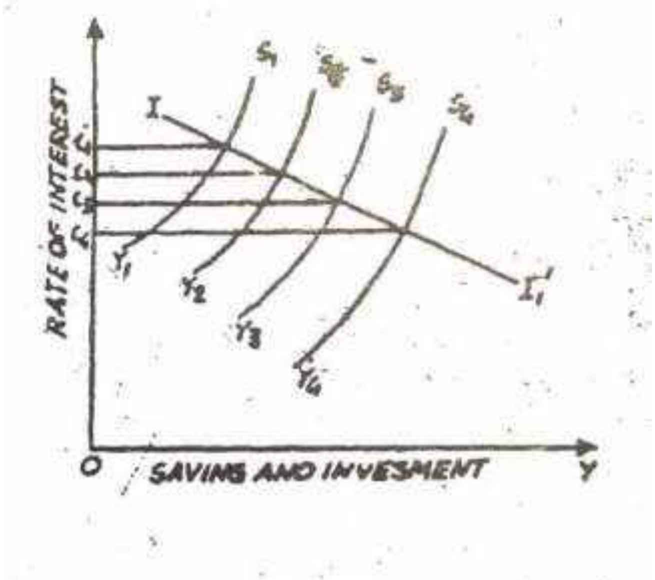


Fig. 4.1

The latter assumption mentioned above implies that there is not one particular saving function linking it with the rate of interest but a series or family of saving schedules, each one of which is associated with a particular level of income as shown in the following Fig. 4.1 S_1, S_2, S_3, S_4, ... are a family of saving schedules, all positively sloped indicating higher savings at a higher rate of interest as postulated in the classical and neoclassical theories. Each one of them is associated with, a given level of income such as S_1, with Y_1, S_2 with Y_2 and so on. The higher is the level of income, the higher is the amount of savings at any given rate of interest. This means that in the above figure $Y_1 < Y_2 < Y_3 < Y_4$. The above diagram shows that if the rate of interest is i_1 savings and investment in the desired sense equal at Y_1 level of income with which S_1 saving schedule is associated. Hence, given i_1 rate of interest, equilibrium in the product market will take place at income level Y_2. It is because at i_2 rate of interest, the equilibrium condition in the product market (desired savings equal desired investment) is satisfied on S_2 curve which is associated with Y_2 income level. Thus we find that a higher income level is associated with a lower rate of interest.

The investment function I I' is negatively sloped because behind it lies diminishing marginal efficiency of capital and investment. Under the assumption of profit-maximising behvaiour of entrepreneurs, is carried upto the point where the marginal efficiency of investment is equals the rate of interest. Therefore a higher investment be associated with a lower rate of interest, thus giving the investment function. Whether it is higher or lower depends on the state of business expectations and technology. Optimistic expectations would raise it, while pessimistic expectations will lower it. Improvements in technology which raise productivity and consequently profitablility will also act to push up the investment function.

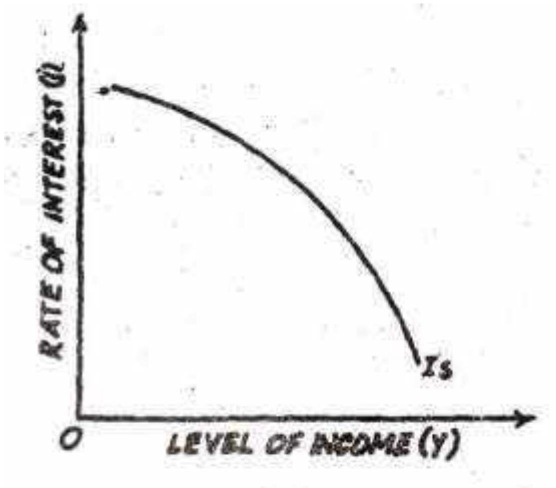


Fig. 4.2

Now, the family of saving schedules in the above figure in conjuction with the investment function tells us the equilibrium income level in the products market, provided we know what the equilibrium rate of interest is. But the equilibrium rate of interest cannot be known from the above model of the equilibrium in the product market, for the rate of interest is determined in the money market. Nevertheless, we can derive from the above diagram a curve linking different levels of equilibrium income with the required rates of interest. As we observed above, the above model of equilibrium in the product market shows that a higher equilibrium level of income is associated with a lower rate of interest. Therefore such a curve linking different levels of equilibrium income with the required rate of interest will be negatively sloped as the IS curve in the following Fig. 4.2. This I S curve does not tell us what the equilibrium income actually would be unless we know what the equilibrium rate of interest is. But as we have already pointed out, equilibrium rate of interest which is determined in the money market cannot be known from the above model of equilibrium in the product market. As a matter of fact, even as a model of product-market equilibrium, it is incomplete because in itself it does not provide a determinate solution to the equilibrium in the product market. Since the rate of interest is indeterminate here, the equilibrium income level also remains indeterminate, though the model does throw up the essential determinants of equilibrium in the product market.

4.3.1 An Alternative Route for Deriving IS Curve

We can derive the IS curve in an alternative way also without postulating the classical-neoclassical saving schedule. We shall here also avail ourselves of the opportunity to extend our model to include the government sector also. In an economy with a government sector, we have the following national-income accounting equation:

(1) $Y = C + I + G$

But C, the consumption expenditure, is the function of disposable income. Therefore

(2) $C = C\{Y - t(Y)\}$

where t(Y) is the government tax function

Substituting (2) into (1):

(3) $Y = C\ (Y - t\ (Y) + I + G$

or (4) $Y - C = S\ \{Y - t\ (Y) + I + G\}$

The equation (4) states the equilibrium condition in the product market. Put in words, it means that the product market is in equilibrium when the total savings in the economy, private savings [s(Y–t(Y)] plus public savings [t(Y)], equal the sum of private investment expenditure (1) and the public (government) expenditure (G).

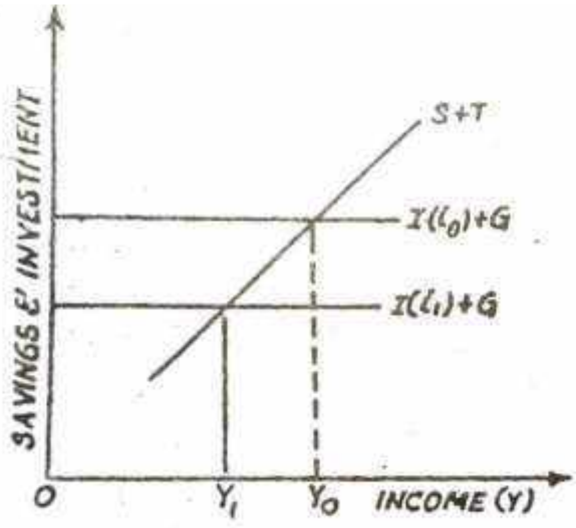


Fig. 4.3

We further assume that the private investment expenditure is independent of level of income but is an inverse function of the rate of interest relating larger investment with lower rate of interest. Now we shall show with the help of the following familiar diagram of Keynesian macroeconomics how the equilibrium in the product market, that it, how the equilibrium level of real income changes with a change in the rate of interest.

In the above diagram $I\ (i_0) + G$ line represents the initial private investment expenditure plus government expenditure. Both are autonomous of the level of income. Hence this line is a horizontal line. The initial rate of interest is assumed to be i_0. The equilibrium condition of the product market as stated in equation (4) above is met at income level Y_0. So the product market is in equilibrium at Y_0 level of income when the rate of interest is i_0.

Now, let the rate of interest rise of higher level i_1. All other things remaining the same, it will reduce private investment expenditure: in the economy, as the investment expenditure is inversely related with changes in the rate of interest. Therefore, the horizontal line $I\ (i_0) + G$ will shift down to the position $I\ (i_1) + G$ and it will intersect the $S + T$ line at a lower level of income Y_1, which will be the new equilibrium level of income at the higher rate of interest i_1.

Thus, we find that in the product market, equilibrium shifts with a change in the rate of interest such that with a rise in the rate of interest, the equilibrium shifts to a lower level of income and with a fall in the rate of interest, it shifts to a higher level of income. If we draw a curve linking different rates of interest to their corresponding equilibrium levels of income, we shall get the IS curve as shown in the following Fig. 4.4. It has a negative slope.

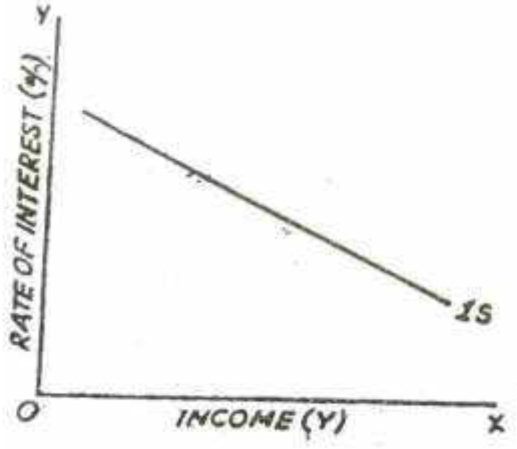


Fig. 4.4

It is obvious that the IS curve is the locus of all such combinations of rate of interest and level of income that keep the product market is equilibrium, as the planned private investment expenditure plus government expenditure over this curve equals planned private saving plus public saving (tax revenue).

Self Check Exercise-1

Q1. How equilibrium takes place in the product Market?

4.4 Equilibrium in the Money Market

While in the Hicks-Hansen model, IS curve which shows equilibrium is the product market is derived from the classical-neoclassical family of savings or loanable-fund schedules combined with the negatively sloping interest-investment function a matching curve known as the LM curve in the model which shows equilibrium in the money market is derived from a family of Keynesian liquidity preference schedules as explained below.

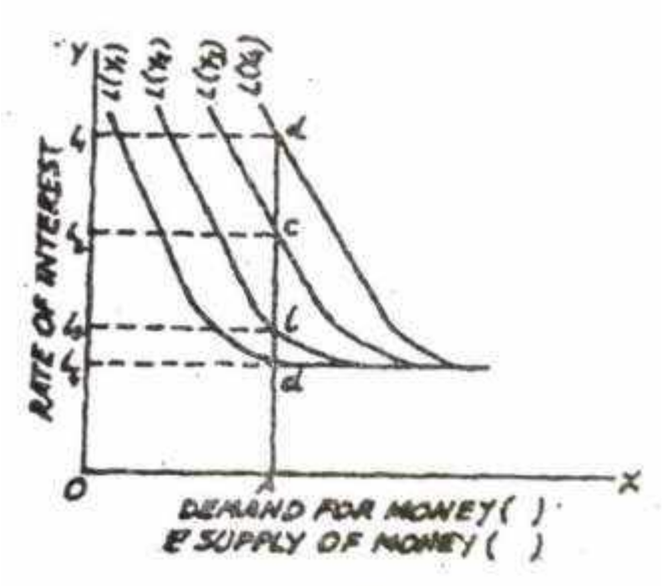


Fig. 4.5

In Keynes's model liquidity preference, that is, preference of individual and business firms to keep their assets in the form of readily available purchasing, power (money) is a function of the rate of interest as well as the level of income. Thus different levels of income will give different liquidity preference schedule. The schedule shows that the demand for money is an inverse function of the rate of interest. According to Keynes this function or schedule becomes perfectly elastic at some critically minimum rate of interest. We draw hereunder in Fig. 4.5 a diagram showing all these propositions

In the above Fig. 4.5 L_0, L_1, L_2, L_3, ... are different liquidity preference schedules related to different levels of income Y_0, Y_1, Y_2, Y_3,....... such that $Y_0 < Y_1 < Y_2 < Y_3$. These schedules show how much money will be demanded at different rates of interest when the level of income is given and constant. The higher is the level of income, the higher is, the position of the liquidity preference schedule as shown in Fig. 4.5. All schedules become perfectly elastic at the critically minimum rate of interest i_0 indicating the liquidity trap.

The condition of equilibrium in the money market is:

$M = L\ (i, Y)$

where L. (i, Y) is money demand or liquidity preference function and M is the supply of money which is determined exogenously and is autonomous of the rate of interest, according to Keynes. It can be seen from Fig. 4.5 that when the level of income is Y_0 and therefore the relevant liquidity preference schedule is L_0 the condition of equilibrium in the money market is satisfied at i_0 rate of interest. Thus monetary equilibrium settles down at i_0 rate of interest. As income rises, the liquidity preference schedule goes on shifting to the right and the equilibrium in the money market takes place at higher and higher rate of interest. Thus it is obvious from Fig. 4.5 that the higher is the level of income the higher is the rate of interest at which equilibrium the money market will take place. If we draw the locus of all such pairs of the rate of interest and the level of income at which the money market is in equilibrium, we shall get the famous Hicks-Hansen LM curve having a positive slope as shown in Fig. 4.6.

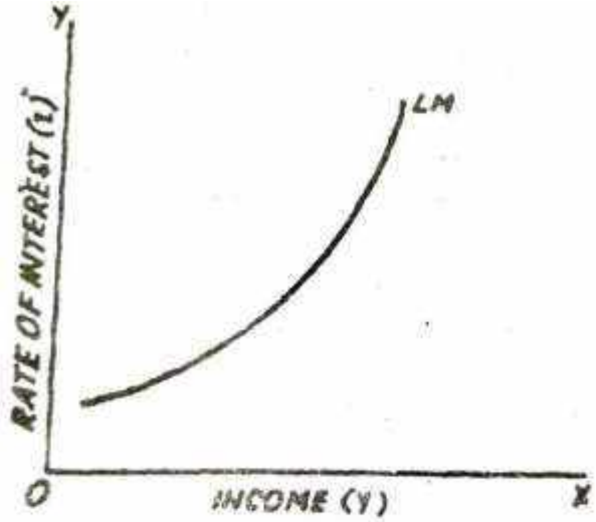


Fig. 4.6

Self Check Exercise-2

Q1. How equilibrium takes place in the Money Market?

4.5 Equilibrium in the Product and the Money Market

It should be noted that the IS curve shows a whole series of equilibrium positions in the product market. Out of these which equilibrium position will be actually realised cannot be known from IS curve alone, for it tells us only what the equilibrium level of income would be, if we know what the equilibrium rate of interest is. But the IS curve cannot tell us what the equilibrium rate of interest is.

Similarly, LM curve shows a whole series of equilibrium positions in the money market. Out of these which would be actually realised cannot be known from it alone, for it tells us only what the equilibrium rate of interest would be, provided we know what the equilibrium level of income is. But the LM curve cannot tell us what the equilibrium level of income is.,

However, while the IS curve in itself leaves the equilibrium in the product market indeterminate and similarly the LM curve in itself leaves the equilibrium in the money market indeterminate, a determinate solution for equilibrium in both the markets can be found by superimposing these curves on each other, that is, while the partial equilibrium analysis may fail to give a determinate solution to the problem of determinating equilibrium in the product as well as the money market, the general equilibrium analysis will slolve this problem. They are determined simultaneously as the two markets are interlinked, because the rate of interest and level of income are interlinked.

Equilibrium in the product market and the money market is determined simultaneously by the intersection of the IS and LM curves as shown in the following Fig. 4.7. The equilibrium level of income is Y, and the equilibrium rate of interest is i_0. At this combination planned saving equals planned investment as the equilibrium point E lies on the IS curve and the product market is in equilibrium. At this very combination of income and rate of interest (Y_0, i_1), the demand for money also equals the supply of as the equilibrium point E lies on the LM curve also and thus the money market is also in equilibrium.

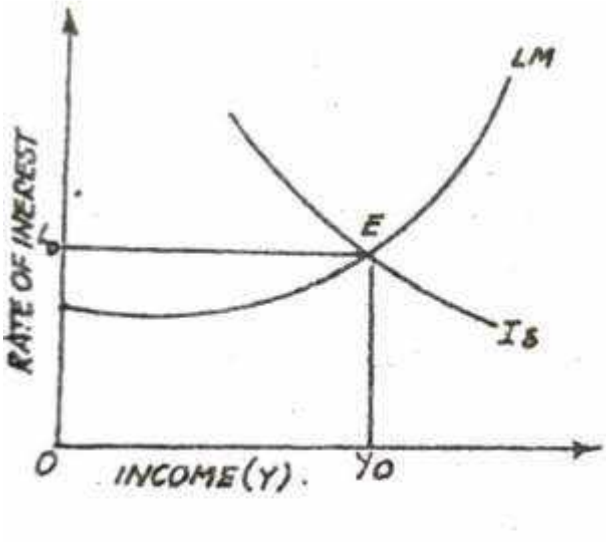


Fig. 4.7

4.6 Fiscal Policy Effects

Fiscal policy refers to the government policy with regard to its revenue and expenditure. Since revenue is generally received by governments through taxes, fiscal policy has reference to the tax and expenditure policies of the government. Therefore, in this section we shall examine the effects of changes in government expenditure and taxes on equilibrium income, rate of interest and aggregate demand.

An increase in government expenditure directly increase the aggregate demand. Moreover, it will shift the IS curve upwards. This becomes clear if we revert to the analysis of section 3 and particularly to Fig. 4.3. With increase in G (government expenditure) the horizontal line 1 (i) + G shifts upwards, even when the rate of interest remains constant. This gives a higher equilibrium income level at the same fixed rate of interest. This means that the IS curve as given in Fig. 4.4 shifts up- wards to the right. This upward shift of IS curve with LM curve remaining fixed will shift the equilibrium in the product market at a higher level of income.

With increase in income, the transaction demand for money which is the function of the level of income will increase. As a part of the given fixed stock of money is diverted to satisfy this increase in the transaction demand for money, a smaller amount of money is available to satisfy the speculative demand for money. Consequently, the equilibrium rate of interest may tend to decrease private investment expenditure. Bu when G rises adding to the aggregate effective demand directly as well as through multiplier effect, business expectations become bouyant. This will tend to shift the IS curve upwards much more than when increase in G has no effect on business expectations. These effects are illustrated in the following diagram of Fig. 4.8.

In Fig. 4.8, E_0 represents initial equilibrium with equilibrium income Y_0 and equilibrium rate of interest i_0. When G increases, IS curve shifts to the position IS_1 partly due to the direct rise in G and partly due to its favourable effect on business expectations. If the rate of interest remains fixed, the equilibrium in the product market would take place at Y_2. But, in fact, increase in income will have effects on the money market too as explained above. Increase in income increases the demand for money and money supply remaining the same, it pushes up the rate of interest. Both the markets would again regain equilibrium when the rate of interest rises to i_1 and the level of income increases to Y, rather than Y_2.

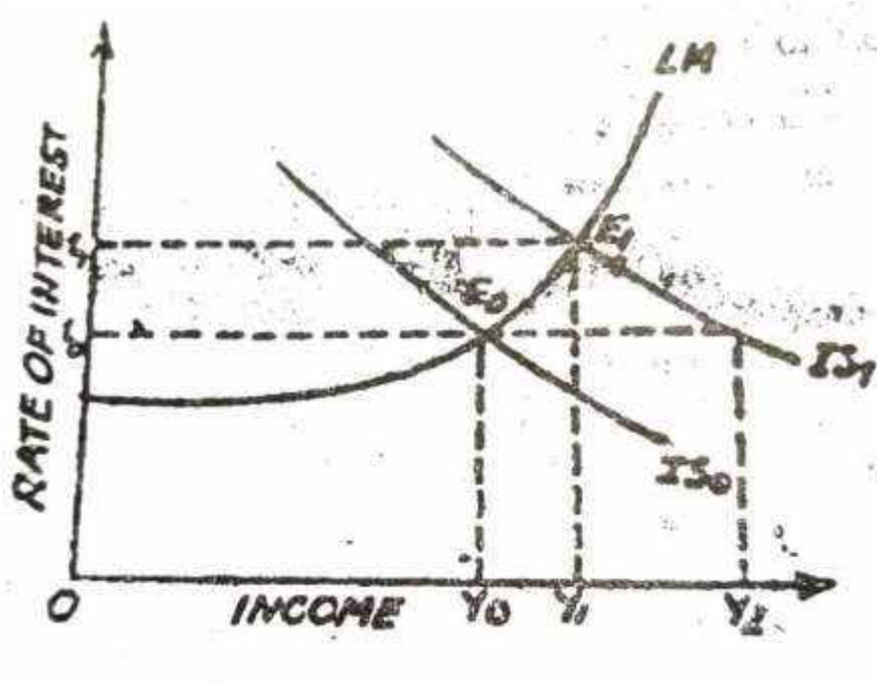


Fig. 4.8

A reduction in tax revenue through a policy of abolition of some taxes or reduction of tax rates or both will also have similar effects. IS curve will be shifted upwards and equilibrium will take place at a higher level of income as well as higher rate of interest. One important point of difference would be that when G alone rises, a good part of the increase in aggregate demand will consist of government purchases, though some in- crease in the demand for consumer's goods as well as private investment demand cannot be ruled out. But when only taxes are reduced, the increase in aggregate demand takes the form of increases in the demand for consumption goods and private investment demand.

It is obvious that a decrease in government expenditure and an increase in taxes and tax rates will have the opposite effects. Such a fiscal policy will tend to reduce the aggregate demand and the equilibrium income level and it will also reduce the rate of interest which would tend to counter the decrease in private investment-demand which otherwise would have fallen much more. In this case IS curve shifts downwards.

Self Check Exercise-3

Q1. Discuss fiscal Policy effects.

4.7 Monetary Policy Effects

Monetary policy generally refers to the policy of -the central monetary authority of a country with respect to changes in the money supply. An increase in the quantity of money would shift the LM curve downwards, provided the price level remains constant. It will reduce the equilibrium rate of interest and increase the aggregate demand and the equilibrium level of income as shown in the following Fig. 4.9. LM_0 is the initial LM curve when money supply is M_0. So equilibrium level of income is Y_0 and equilibrium rate of interest is i_0. When the supply of money increase of M_1, the LM curve shifts downwards to the position LM_1. In fact, an increase in money supply would increase aggregate demand directly as well as through changes in the rate of interest. Increase in money supply reduces the rate of interest to I_2 at the initial level of income Y_0. But this will raise pri- vate investment demand and expenditure which, through the multiplier effect, will increase aggregate demand. The increase in aggregate demand will increase the transaction demand for money. So a part of the increase in money supply will go to satisfy this demand, reducing the additional supply of money available for satisfying the speculative motive for holding money. Consequently, the rate of interest will rise from i_2 to i_1, as the level of income and aggregate demand rises from Y_0 to Y_1.

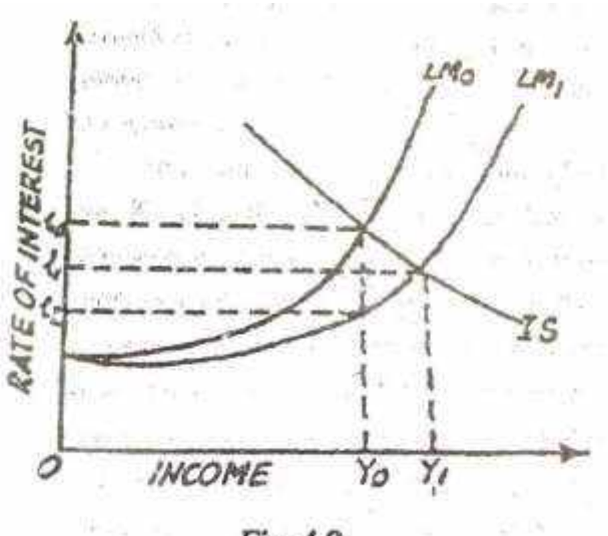


Fig. 4.9

The decrease in money supply has the opposite type of effects. The aggregate demand decreases directly as well as in consequence of the change in the rate of interest that it will bring about. The rate of interest will rise as less money will be available to satisfy the existing demand. So bonds will be sold in the bonds market to realise enough money to satisfy the demand for money. Bond prices will fall and rate of interest will rise. This will reduce private investment demand as well as demand for consumer's durables. Thus the aggregate demand falls which pushes down the equilibrium in the product m. The rate of interest will tend to rise more initially when the level of income remains at the initial level. But, as the level of income starts falling under the impact of falling aggregate demand, the transaction demand for money will decrease releasing a part the money supply to augment the money supply available for satisfying the speculative motive of holding money. Consequently the rate of interest will begin to fall. But in the final equilibrium position, the money market will be in equilibrium at a rate of interest which remains higher than in the initial equilibrium position and the product market will be in equilibrium at a lower level of income. The LM curve in this case will shift upwards, provided the price level does no to draw for themsela above in Fig. 4.9 for a case in which supply money decreases.

The consideration of aboy policy effect shows that the fiscal and monetary policies can be employed as alternative policies as well as complementary policies to each other for bringing about appropriate changes in the aggregate demand in order to cure depressions or inflation. However, it should be notering depressions, the monetary policy will be ineffective due to the liquidity trap which makes the LM curve horizontal curve at a critically minimum rate of interest. However, the fiscal policy will be effective. ON the other end, the LM curve is likely become vertical at the full-employment level of income after which inflationary situation develops. In his case etive but the monetary policy will be effective and thus can be used both as alternative policies and complementary policies, though effective used as complementary policies. These p positions are illustrated in the following diagram of Fig. 4.10.

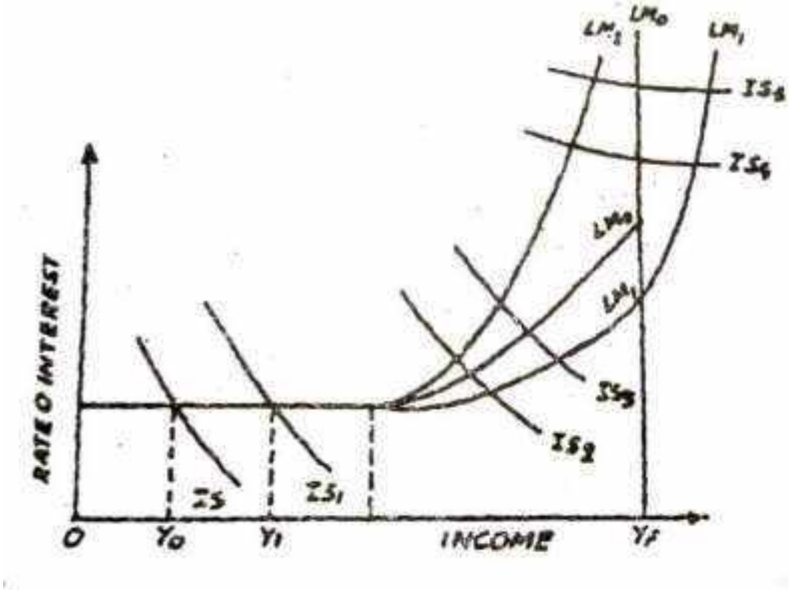


Fig. 4.10

All LM curves at various levels of money supply merge together into the common horizontal portion at the critically minimum rate of interest im. This means that if the economy is in a state of depression and the economy is operating within the horizontal range, any change in the supply of money will not shift this horizontal portion of the LM curve. Supposing the IS curve to be in the position ISO, equilibrium income YO will remain unaffected by any change in the supply of money. Thus monetary policy is ineffective. The whole increase in supply is trapped in liquidity as the demand for money at im rate of interest is perfectly elastic. But fiscal policy changes- increase in government expenditure or reduction of taxes or both together (deficit budgeting)– will shift the IS curve from ISO position to the right to a position like 1S1 which raises the aggregate Gemand and the level of income to Y1. Thus fiscal policy is effective during depressions while monetary policy is ineffective. This conclusion, however, depends on the validity of the Keynesian liquidity trap hypothesis. That is why this horizontal range is described as Keynesian range. Similarly, it can be seen that in the vertical range, that is, in the over-full employment situations, the fiscal policy-reducing government expenditure and rasing taxes (surplus budgeting)-will be ineffective. Shifting of IS curve from IS5 to IS4 with money supply fixed will have no effect on income level. It is assumed that there is some very high level of the rate of interest (if in Fig. 4.10 above) at which the demand for money become perfectly inelastic with respect to the rate of interest so that demand for money depends only on the level of income. This explains the vertical range. In this case a decrease in money supply will reduce the level of aggregate demand and the income level. In this case LM curve will shift upwards to a position like LM2 in Fig. 4.10 which intersects the ISS curve at a lower level of income. Thus monetary policy is effective, while fiscal policy is not.

Self Check Exercise-4

Q1. Discuss Monetary Policy effects.

4.8 Price Flexibility and Employment

The LM curve shifts not only due to change in the money supply but also due to change in price level. When the generaoney balances (M/P) in the hands of the people increase. As Patinkin has forcefully pointed out, the demand for money is demand for real money balances. When foly demand function as M= L (i,Y), we assume the price level to be given and constant so that there is no distinction between real money balances and nominal money balances. But when price level is a variable and not a constant, the money demand function becomes: M = L (i, Y, P) At a lower price level you require a smaller amount of nominal money to transact the same volume of business. Hence, as prices fall, th demand for nominal money falls. This results in shifting the liquidity preference schedules to the left and shifting the LM curve to the right. This if all the prices inclusive of wage rates and interest rate had been perfectly flexible as assumed by the classicals, the LM curve will go on shifting downwards till full employment was achieved. In this case there is no liquidity trap and no horizontal portion common to all LM curves. This is the classical case. But if the wage rate or interest rate or both become rigid downwards during depressions as suggested in the Keynesian model, the price-flexibility will have no effect on employment and income level. Fall in prices cannot lower the horizontal portion of the LM curve due to liquidity trap. This is the Keynesian case. However, even the classical model will give the same result, if either wage rate or interest rate or both become rigid downwards.

Self Check Exercise-5

Q1. Write a short note on price flexibility and employment.

4.9 Summary

We thus see that changes in propensity to consume (or desire to save), investment or Government expenditure, the supply of money and the Liquidity Preference will cause shifts in IS or LM curves and will thereby bring about changes in the rate of interest as well as in national income. Hicks-Hansen integration of classical and Keynesian theories of interest clearly shows that Government can influence the economic activity or the level of national income through monetary and fiscal measures. Through adopting an appropriate monetary policy the Government can shift the LM curve and through pursing an appropriate fiscal policy Government can shift the IS curve. Thus both monetary and fiscal policy can play a useful role in regulating the rate of economic activity in the country.

4.10 Glossary

Effect of changes in the desire to save or propensity to consume : When people's desire to save falls, that is when propensity to consume rises, the level of national income will rise at each rate of interest.

Effect of changes in Investment and Government expenditure : If either the private investment increases or Government steps up its expenditure, this will bring about the increase in national income.

Effect of changes in Liquidity Preference : Changes in Liquidity Preference will bring about changes in the LM curve of the Liquidity preference of the people rises, the LM curve will shift to the left. This is because of higher Liquidity preference, given the supply of money, will raise the rate of interest corresponding to each level of national income. With the Leftward shift in the LM curve, given the IS curve, the equilibrium rate of interest will rise and the level of national income will fall.

4.11 Answers to self check questions

Self Check exercise -1

Ans.1. Refer to Section 4.3

Self Check exercise -2

Ans.1. Refer to Section 4.4

Self Check exercise -3

Ans.1. Refer to Section 4.6

Self Check exercise -4

Ans.1. Refer to Section 4.7

Self Check exercise -5

Ans.1. Refer to Section 4.8

4.12 References/ Suggested Readings

1. J.R. Hicks, "Mr. Keynes and the Classics: A Suggested Interpretation," Econometrica, Vol. V. (1937), pp 147-159
2. A. Hensen, Guide to Keynes, Ch. 6
3. W.H. Branson, Macroeconomic Theory and Policy, Ch. 4 and 5
4. E. Shapiro, Macroeconomic Analysis Ch. 16.

4.13 Terminal Questions

Q. 1 Discuss the role of monetary and Fiscal Policy in product and Money market.

Q. 2 Discuss various tools of monetary and fiscal policies with the help of which employment and income can be increased.

*****

Unit - 5

UNEMPLOYMENT AND WAGE RIGIDITY, BALANCED BUDGET THEOREM AND PORTFOLIO DISEQUILIBRIUM AND THE TRANSMISSION MECHANISM

Structure

5.1 Introduction

In the present lesson we shall comment upon three topics which are rather unrelated to each other but are a part of the Unit I of the syllabus of the course on macroeconomics.

5.2 Learning Objectives

After going through this chapter you will be able:

- To know unemployment and wage Rigidity.
- To know Wage Rigidity in the Keynesian Model.

- To know wage Rigidity in the Classical Model
- To understand Balanced Budget Theorem.
- To understand port-folio disequilibrium and the transmission Mechanism.

5.3 Unemployment and Wage Rigidity.

Wage rigidity here refers to the failure of the money wage rate to respond immediately to a change in the aggregate demand condition and the consequent change in the price level. We shall consider first the impact of the wage rigidity on unemployment and employment with reference to the general Keynesian model and then, after it, with reference to the classical model.

Self Check Exercise-1

Q1. What do you mean by unemployment and wage rigidity?

5.4 Wage Rigidity in the Keynesian Model.

We know that the labour demand is the function of marginal product of labour $\frac{dY}{dN}$. Assuming perfect competition and expressing this function in money terms, the labour demand is a function of the marginal revenue product of labour which under perfect competition equals value product of labour. Hence we denote the labour demand function in Fig. 5.2 as P. $\frac{dY}{dN}$ where P is the price. Similarly, the labour supply is the W function of real wage $\frac{W}{P}$ where W is money wage rate and P is the price level. But the workers cannot know for sure the price. The labour supply is determined by the price level expected by them to prevail. Hence we denote the labour supply function in Fig. 5.2 as P^1. $\frac{W}{P}$ where P^1 is the expected price level.

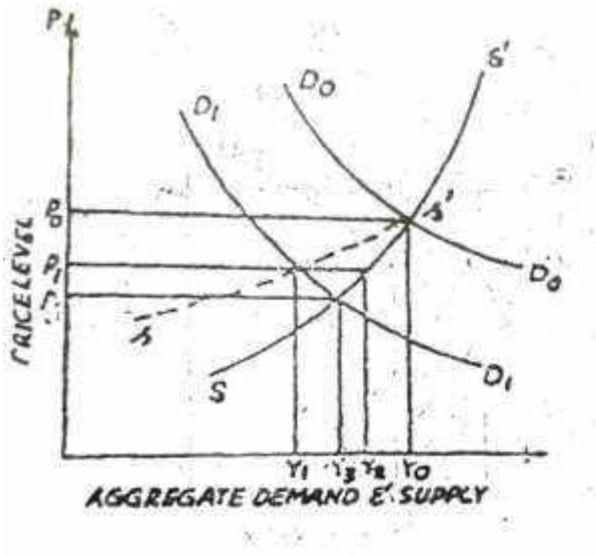


Fig. 5.1

Now we suppose that the initial equilibrium takes *place where the initial aggregate demand curve D_0 D_0 in Fig. 5.1 intersects aggregate supply curve SS' which means that in the initial equilibrium position income level is Y_0 and the price level is P_0 as shown in Fig. 5.1. Corresponding to this equilibrium depicted in Fig. 5.1 we have the initial labour demand function $P_0 . \frac{dY}{dN}$ and the initial labour supply function $P^1_0 \cdot \frac{W}{P}$ as depicted in Fig. 5.2.

Their intersection gives the initial equilibrium employment. N_0 and the equilibrium money wage rate W_0. N_0 being full employment, the unemployment in the initial equilibrium situation is N_1N_0 but it, is voluntary unemployment. It is because the equilibrium lies on the labour supply function and therefore only N_0 is supplied willingly at the money wage rate W_0 sand all this is employed. The rest N_1 N_0 is, therefore, voluntary unemployment.

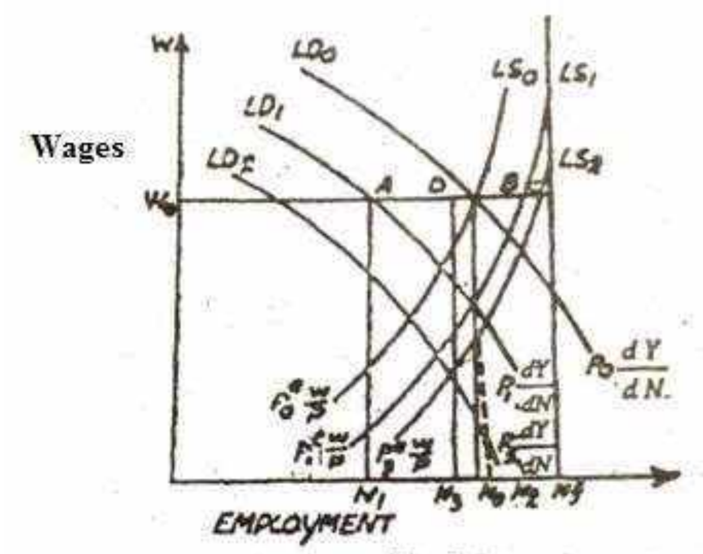


Fig. 5.2

We now assume that there is a decrease in the aggregate effective demand, say due to the collapse of private investment expenditure or due to a slash in the government expenditure. The aggregate demand curve in Fig 5.1, consequently, shifts downwards to the position D_1D_1. The price level falls. Since fall in price real wage rate, labour supply curve is lowered to the position $P_1e. \frac{W}{P}$ in Fig. 5.2. And the labour demand curve shifts down to the position $P_1. \frac{dY}{dN}$ in Fig 5.2. But we suppose that the money wage rate remains rigid at W_0. Now the amount of labour demanded or employed by the employers of labour will be given by the point A corresponding to W_0 on the shifted labour demand curve $P_1. \frac{dY}{dN}$ in Fig. 5.2. This means that due to the wage rigidity employment falls to N_1 and AB involuntary employment as the point corresponding to the rigid money wage rate W_0 on labour supply function $P_1^e, \left(\frac{W}{P}\right)$ is B. The wage rigidity in this model implies that the labour supply function below the prevailing money wage rate W_0 will be replaced by a horizontal line at W_0. This gives us the Keynesian labour supply function of the type we illustrated in our Fig. 3.2 in our lesson No.3. Thus with price level falling, equilibrium employment will fall along the W_0 horizontal line instead of along the shifting labour supply curve in Fig. 5.2. Consequently, a given fall in the price level causes a bigger fall in employment when there is wage rigidity than it would do with wage-flexibility. If wage rate was not rigid, the new equilibrium with price level $P=P_1$ would have occurred where the shifted labour demand function $P_1. \frac{dY}{dN}$ intersects the shifted labour supply function P_1e.

$\frac{W}{P}$, that it, at employment N_2 Hence in the general Keynesian model, wage-rigidity causes bigger involuntary unemployment than what would be caused in the absence of wage-rigidity.

The wage-rigidity at W_0 which makes the labour supply function horizontal at W_0 in Fig. 5.2 will modify the aggregate supply function SS' in Fig. 5.1. The new equilibrium will take place where the lower shifted aggregate demand function D_1D_1' intersects the modified aggregate supply function in the denied portion ss'. Hence new equilibrium takes place at Y_1 and P_1. It can be seen that in the absence of wage rigidity the supply of output would have been Y_2 as the point corresponding to P_1, on the unmodified aggregate supply curve gives this level of output (Y_2) which corresponds to N_2 level of employment of Fig. 5.2. But this output will result in excess supply, as at P_1, aggregate demand is less than Y_2. As a result the price level will fall further and the new equilibrium will be reached only when the price level falls to P_3 and the aggregate demand and aggregate supply equal at output Y_3.

In conclusion, with money wage rate rigid, the Keynesian model gives a new equilibrium at P_1, Y_1, W_0 and N_1 when the aggregate demand shifts from D_0, D_0' to D_1D_1' as shown in Fig. 5.1 and 5.2. But, in the absence of wage rigidity, the new equilibrium would be at P_3, Y_3, in Fig. 5.1 and at employment N_3 in Fig. 5.2 where the labour supply function P_3 $\frac{W}{P}$. The involuntary unemployment with money wage rate rigid at W_0 is CD.

Self Check Exercise-2

Q1. What do you mean by unemployment and wage rigidity?

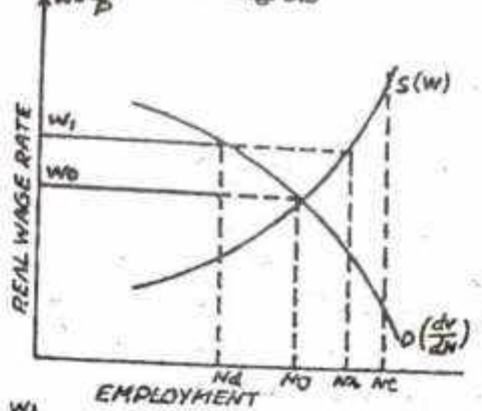
5.5 Wage Rigidity in the Classical Model

In Fig.5.3 below we have the classical labour demand function D $\left(\frac{dY}{dN}\right)$ sloping downwards to the right due to diminishing returns. S(w) is the classical labour supply function becoming vertical at full employment N_1 when all available labour force is employed. Initial equilibrium takes place where these two functions intersect, that is, at employment N_0. The same situation of initial equilibrium is shown in Fig. 5.4 where the labour demand function is drawn with wage rate in money terms. (W) and marginal value product under assumption of perfect comptition. Labour supply function is also related to money wage rate (W). In this initial situation of equilibrium, employment is N_0, price level is P_0 money wage rate is W_0, and the real wage rate is W_0 = $\frac{W_0}{P_0}$. The initial equilibrium, output is Y_0 as shown in Fig. 5.5 wherein D_0D_0 is the initial aggregate demand function and the vertical S' S' is the classical aggregate supply curve.

Now let the aggregate demand function in Fig. 5.5 To shift downward to the position D_1D_1 due to fall in aggregate demand caused by a collapse of private investment expenditure or slashing of government expenditure or We both. This creates excess supply at price level P_0 on account of which price level falls to P_1. If money wage rate is rigid at W_1, the real wage rate at the lower price level would be higher, say, at w_1 in Fig. 5.3. At this real wage rate only N_d

employment will be available while labour supplied willingly at this real wage rate is N_0. Hence wage rigidity causes an involuntary unemployment equal to N_1 N_1. Note that in the initial equilibrium too there is unemployment equal to N_0N_1. But this is voluntary unemployment.

Fig. 5.3



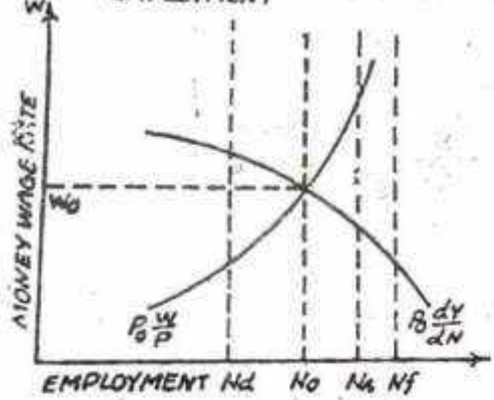


Fig. 5.4

With money wage rate rigid at W_0 and price level falling down from P_0 the employment and output fall along the labour demand function. This will give lower employment and smaller output with each fall in the price level. This means that there will be a positively sloping segment on the aggregate supply curve below the initial equilibrium corresponding to price level P_0 as shown by ss' in Fig 5.5.

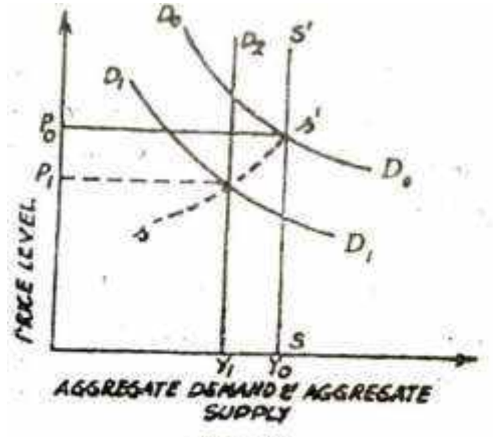


Fig. 5.5

Thus we find that wage rigidity causes involuntary unemployment in both the Keynesian and the classical model.

However, it should be noted that due to rigid money wage rate unemployment with reference to the total available labour force increases from N_0 N_1 to N_d N_1. But the genuinely involuntary unemployment has increased only from zero to N_d N_1 in Fig. 5.3 at real wage rate w_1. This is specially noteworthy because N_d N_1 does not measure the "effect" of the wage of rigidity. If the money wage rate had not been rigid, employment would have returned to N_0 in the classical model. Therefore, true involuntary unemployment which can be attributed to wage rigidity is N_dN_0 and not N_dN_1 which overstates the effect of wage rigidity by N_0N_1.

Moreover, the rigid-wage version of the classical model as illustrated in Fig. 5.5 above, provides a solution to the liquidity-trap problem. If there is indeed a liquidity trap, falling price level and the consequent increase in real balances $\left(\frac{M}{P}\right)$ with money supply (M) fixed will not add to aggregate demand. This means that the aggregate demand will not only shift to the left but will also become vertical. This would make the classical model inconsistent, because in that case the vertical aggregate demand curve will cut the vertical aggregate supply curve nowhere and equilibrium becomes indeterminate. But if the money wage rate is rigid, then the portion of supply curve below the initial equilibrium price level P_0 corresponding to the rigid money wage level (W_0) of Fig. 5.4 becomes positively sloped like the portion ss' in Fig. 5.5 above. Consequently, the shifted vertical demand curve D_2 Y_1 cuts the supply curve in this portion as can be seen in Fig. 5.5. This ensures a new equilibrium at price level P_1 and output level Y_1.

Self Check Exercise-3

Q1. Discuss wage Rigidity in the Classical Model.

5.6 Balanced Budget Theorem

Balanced Budget Theorem states that when government expenditure is exactly matched with equal tax revenue of the government in any given budgetary period so that there is neither a surplus nor a deficit in the budget, the national income of the economy increases just by an amount equalling the increase in government expenditure over this expenditure in the previous period. Suppose, for example, that India's finance minister frames such a budget for a particular year, say 1992-93, that it provides for an increase in government expenditure amounting to Rs. 1000 crores. But, at the same time taxes and tax rates are proposed in such a manner that the tax revenue of the government exactly equals this increase in government expenditure amounting to Rs. 1000 crores. We further suppose that this budget is passed and implemented. Then, according to the Balanced Budget Theorem, the national income of India will increase exactly by Rs. 1000 crores, all other things remaining the same. In other words, this theorem states that the balanced budget multiplier is unity.

How this comes about can be explained with the help of the theory of the balanced budget multiplier for which we have to build up a fiscal model of the multiplier.

Fiscal Model of the multiplier, obviously, presumes a government sector in the economy which, in turn, implies the existance of government expenditure (G) and government taxes (T). In such a model, the accounting equation of national income is :

(1) $Y = C + I + G$

where Y is gross national income; C is private consumption expenditure; I is private investment expenditure; and G is government expenditure.

In such an economy the private consumption expenditure (C) is a function not of gross national income but of disposable income. The equation of the disposable income is:

(2) $Y_d = Y - T + R$

where Y_d is disposable income; Y is gross national income; T is tax revenue of the government; R is transfer payments received by the people from the state.

Hence the consumption function of a fiscal model is given by the equation:

(3) $C = a + c\,Y_d$

where C is consumption expenditure; a is autonomous consumption expenditure; c is the marginal propensity to consume out of the disposable income Y_d

Now, substituting (2) and (3) into (1), we get;

(4) $Y = a + c\,(Y - T + R) + I + G$

In our present simple model we assume that investment (I) is autonomous, that is, it is not affected by changes in the level of income.

The equation (4) above can be rewritten after simplification as under:

(5) $Y = a + cY - cT + CR + I + G$

After taking all terms containing Y to the left side and taking Y as common to all these terms we have:

(6) $Y\,(1 - c) = a - cT + cR + I + G$

It follows from the above equation that the government expenditure multiplier is, $\frac{1}{1-c}$ the same as the simple investment multiplier. This means that any change in G (Δ G) will act to change Y by an amount equalling Δ G. $\frac{1}{1-c}$ in the same direction in which. G changes.

On the other hand, the same equation (6) shows that the tax multiplier is – $\frac{c}{1-c}$ that is, it is negative which means any change in tax revenue of the government will change Y in the opposite direction: An increase in T decreases Y and a decrease in T raises Y. Moreover, the numerical value of the tax multiplier $\left(\frac{c}{1-c}\right)$ is less than the numerical value of the government expenditure multiplier which is $\frac{1}{1-c}$, because of marginal to consume) is less than one.

Now, when the government expenditure and government tax revenue increase by the same amount, as they would when the budget is a balanced budget, both the multipliers – the government expenditure multiplier and the tax multiplier work together. As a result of government expenditure multiplier the change in income would be.

(7) $\quad Y = \frac{1}{1-c} \Delta G$

And, on account of the tax multiplier, the change in income would be:

(8) $\quad \Delta Y = -\left(\frac{c}{1-c}\right)$. ΔG as ΔT = ΔG in a balanced budget. Thus the total change in income when the budget is balanced, is:

(9) $\quad \Delta Y = \Delta G. \left(\frac{1}{1-c} - \frac{c}{1-c}\right) = \frac{1-c}{1-c} = 1$

Hence the balanced budget multiplier as suggested in the balanced budget theorem is unity (=1). As the result of it, the income of the economy) increases or decreases by the same amount by which the size of the budget increases or decreases.

Corollaries of the Balanced Budget Theorem

Before we examine the limitations of the balanced budget theorem or the simplified real model of the above type, it will be useful to draw some corollaries or implications from the above model.

Firstly, it shows that a given change in the deficit of the government budget does not have the same multiplier effect on the level of income and employment regardless of how this change in the deficit is brought about. If a given change in the defcit is brought about by changing the government expenditure alone, keeping the tax revenue constant, it will have a greater multiplier effect than when the same change in the deficit is brought about by reducing tax revenue. It is because, as pointed out in the preceding action, the government expenditure multiplier is greater than the tax multiplier. Similarly a change in the surplus of a budget will not have the same effect on income and employment regardless of whether this change in the surplus is brought about by a cut in government expenditure or an increase in tax revenue.

Similarly, it can be demonstrated that any given change in government expenditure will have a greater multiplier effect on income and employment when it is spent by the government directly than it would have if it was spent by the government by way of transfer payments. It is because the transfer payments multiplier which too can be discovered from the equation (6) of the fiscal model explained in the preceding section is $\frac{c}{1-c}$ which is less than the government expenditure multiplier, $\frac{1}{1-c}$

5.6.1 Limitations of the Balanced Budget Theorem.

The Balanced Budget Theorem as explained above is based upon too simplified and unrealistic assumptions to be of any significant use in practice. In the first place, it is assumed that changes in government expenditure and tax revenue have no effects on the other variables of the system such as private investment expenditure which is a very false assumption. But even if we accept that changes in G and T do not have a direct effect on I, they can have an indirect effect on I through changes in the level of income and employment caused by them. The simplified fiscal model from which Balanced Budget Theorem is derived does not take notice of such effects. Investment in actual economies is never totally autonomous.

Moreover, even if we accept, for the sake of argument, that investment is autonomous of changes in the level of income, the same definitely cannot be said about tax revenue. (T). Tax revenue is palpably affected by changes in the level of income. Therefore the simple Balanced Budget Theorem will not work in real life. Let us explain it by making a realistic assumption that tax revenue is a function of the level of income. For the simplification we can assume this function to be a proportional one as shown below in equation (10).

(10) $Y = tY$

Then putting (10) into (5) and solving it for Y, we have :

(11) $$Y = \frac{1}{1-c\ (1-t)}\ (a + CR + I + G)$$

Which means that the government expenditure multiplier is not but a rasmaller one, namely

$$\frac{1}{1-c\ (1-t)} \quad \text{or} \quad \frac{1}{1-c+ct}$$

Since t is positive, (1–c+ct) is greater than (1–c) and hence is greater than $\frac{1}{1-c\ (1-t)}$

Similarly, it can be shown how the multiplier will work, if we assume that the investment is not autonomous but is affected by changes in the level of income. Let us assume the induced investment function as given in equation (12) below:

(12) $1 = e + fY$

Where is autonomous investment and f is the marginal propensity to invest $\frac{dl}{dy}$ or the slope of the investment function of equation (12).

Now, substituting equations (10) and (12) together into equation (5), and solving it for Y, we have

(13) $$Y= \frac{1}{1-c\ (1-t)-f}(a + cR + e + G)$$

which means now the multiplier is greater than when there is only autonomous investment $\frac{1}{1-c\ (1-t)-f}$ is greater than $\frac{1}{1-c\ (1-t)}$

Thus, the equation (13) above implies that tax rev Avenue being a function of the level of income, it tends to reduce the strength of the pure government expenditure multiplier as well as the pure autonomous investment multiplier. On the other hand, the presence of induced investment which is a function of the level of income tends to strengthen the pure government expenditure multiplier as well as the pure autonomous investment multiplier.

In conclusion it can be said that though the Balanced Budget Theorem and the fiscal model on which it is based do provide some useful insights into the working of the effects of changes in the government budget. yet these changes do not work out in real life economies in the simple manner suggested in the Balanced Budget Theorem and even in the more complicated fiscal model embodied in equation (13) above. The fiscal models of the general kind explained above do have some operational significance but their practical usefulness is very much limited due to the simplifying assumptions underlying them.

Self Check Exercise-4

Q1. What do you mean by balanced buget theorem? What are the corollaries of the balanced budget theorem? Discuss its limitations.

5.7 Portfolio Disequilibrium and the Transmission Mechanism

The portfolio balance theory as developed by Jobin and others including Friedman. suggests that choice facing a wealth owning unit, an individual or institution, is not simply to choose between idle money balances and income yielding bonds as a form in which to keep wealth. On the other hand, they point out that there is a whole series of assets in which a wealth owner can keep his wealth. The difference between money and other types of assets (which are sometimes described as near-money assets) they hold is one of degree rather than of kind. These assets yield utility to the asset-holders. The prominent forms of such assets are money, treasury bills, bonds, debentures, equities or joint stock company shares, consumer's durables, and so on. The difference between them lies in the degree of liquidity possessed by them, on the one hand, and the yield that can be expected from them. Liquidity of an asset refers to that attribute of it by virture of which it can be converted into cash without loss of time and value. From this point of view, money lies on 'one extreme end of this spectrum of assets. It enjoys perfect liquidity. On the other extreme end lie assets like houses and consumer's durables which cannot be easily and readily realised into cash without loss of value. At the same time, it should be noted that the perfectly liquid asset, money, yields no income in money terms, though it does yield a sort of subjective. income or return in the form of utility that a money-holder gets from the security provided by this most liquid asset. The near-money assets, on the other hand, yield material income in the form of interest or dividend or capital gains which too yield utility to the asset-holder. Portfolio balance theory suggests that an asset-holder tends to distribute his total wealth among various asset forms in such a manner that his total utility from holding his portfolio of assets is maximised. When this utility function is maximised, the asset-holder's portfolio of assets is balanced. Any change in his total wealth or income or in rates of yield of the assets can disturb this balance and the asset-holder's portfolio goes into a state of disequilibrium which he seeks to correct and bring again into a balance or equilibrium by redistributing his total wealth among the alternative forms of assets.

The process through which a disequilibrium or imbalance in the portfolios of asset-holders is corrected and the effect that this process has on aggregate demand is known as the transmission mechanism.

This transmission mechanism is important in the context of monetary policy. Let us suppose that the economy is passing through depression and the authorities decide to correct the situation by increasing the supply of money for which the central bank of the country will purchase bonds in the bond market. The bond prices will rise and thus their yields will be lowered. On the other hand, asset holders who sell these bonds will come into possession of larger stocks of money. This may jolt the portfolios of asset-holders out of equilibrium and thus a portfolio disequilibrium results.

The first step in the transmission mechanism is that the asset-holders find their real balances (M/P) to have increased beyond what they desire to hold. This causes a portfolio disequilibrium. This implies that at the current rate of interest, the current level of income and the cur- rent price level, the asset-holders are holding more money balances than they want to hold. This will induce the asset-holders to get rid of their excess holdings of money by converting it into other forms of assets. This will raise the asset prices and lower the rates of yield.

At the second stage of the transmission mechanism, the increased demand for other assets and the consequent rise in their prices and fall in their rates of yield affect the aggregate demand.

When the asset-holders substitute other financial assets in place of money in order to get rid of excess real balances, the rates of return or yield on these financial assets fall. Thus there is practically all round fall in rates of interest. The fall in the rates of interest stimulates investment expenditure as well as consumption expenditure. The stimulation of consumption expenditure due to fall in interest rates is not mere theory in economies where hire-purchase system is common and the commercial banks freely finance purchases of consumer's Curables by the people, This process thus helps in increasing the aggregate demand. To what extent this w mechanism helps in argumenting the aggregate demand depends on the sensibility of investment expenditure and consumptions expenditure to change in interest rates.

The above transmission mechanism is known as indirect mechanism which was specially emphasised by ** Keynes who believed that changes in the quantity of money do not affect aggregate demand directly but do it indirectly through their effects on the rates of interest.

It has been also pointed out that the mere substitution of financial assets in place of money does not help in bringing about a full balance or equilibrium in the portfolios of the asset-holders. As the rates of return on financial assets decline with such substitution, the substitution of real assets in place of financial assets and money, if there is still excess holdings of real balances, Segins to look attractive. Consequently the real assets like houses and apartments and other consumer durables begin to be substituted in place of money and financial A assets thus increasing the aggregate expenditure and demand in the economy. Real assets may take the form of titles to real assets like stocks of joint-stock companies. The joint-stock companies regard the time opportune for floating new issues as the share prices rise and the stock exchange market booms up. This further reinforces the investment expenditure and demand. Sooner or later it attractive to substitute other real goods also in place of money and financial assets which further in- creases aggregate expenditure and demand.

While the Keynesians emphasis the above indirect mechanism of transmission of effects of increase in money supply on aggregate demand, Friedman and his school of thought, the monetarist as it is described, emphasises the direct mechanism. Unlike Keynes and his school of thought the monetarists do not believe that changes in the rates of interest precede changes in the demand for goods and services. According to the monetarist school of thought led by Friedman, consequent Caupon an increase in the supply of money, there can be a portfolio adjustment which involves a movement out of Bermoney directly into goods. As Friedman and Meiselman observe in their paper. The Relative Stability of Mon-Betary Velocity and the Investment Multiplier in the United States, 1897-1958." "The end result need not be a change in the interest rates at all; it may be a change. in the general price level or the output." This implies that an increase in money supply can lead directly to spending on real assets.

Patinkin, on the other hand, seems to suggest that both direct and indirect mechanisms work, more or less, together which is perhaps a more realistic proposition www.compared to either the Keynesian or the monetarist www.stand, both of which appear to be rather unrealistically exclusive. On the side of the Keynesians it can, be claimed that the demand for real assets begins to emerge only when the asset-holders find that the alternative assets inclusive of money yield lower rates of return. On the other hand, it can be claimed on the side of the monetarists that any increase in money supply leads to the public holding more money and therefore larger disposable income in their hands which leads directly to increase in expenditure on real goods or assets.

Self Check Exercise-5

Q1. Discuss Portfolio Disequilibrium and Transmission Mechanism.

Patinkin's real-balance effect, which is similar to wealth effect which, in turn, is similar to the income effect of the microeconomic theory of consumer demand, suggests that any increase in money supply will result in increase in real balances in the hands of the people. On account of it, as it happens in the case of income effect, unless any particular class of assets is regarded as an "inferior" good, it will lead to increased expenditure on and increased demand for all types of assets so that when the portfolio equilibrium or balance is restroed with a higher supply of money, people will be holding more of not only non-money as sets but also of money. During the process of readjustment of portfolios by the asset-holders interest rates will have fallen together with increased expenditure on and increased demand for real goods or assets.

This is how the mechanism of a port- folio disequilibrium works out.

5.9 Glossary

- **Wage rigidity:** refers to a situation where wages are insensitive to change in supply demand in labour market.
- **Balanced Budget:** is a situation in financial planning where total expected revenue are equal to total planning spending
- **Real Balance Effect:** states that an increase in the amount of money in the economy first affects the demand and relative price levels and then the absolute prices.

5.10 Answer to self check Exercises

Self Check exercise -1

Ans.1. Refer to Section 5.3

Self Check exercise -2

Ans.1. Refer to Section 5.4

Self Check exercise -3

Ans.1. Refer to Section 5.5

Self Check exercise -4

Ans.1. Refer to Section 5.6 and 5.6.1

Self Check exercise -5

Ans.1. Refer to Section 5.7

5.11 References/ Suggested Readings

1. E. Shapiro, Macroeconomic Analysis, Ch. 25
2. M. Friredman and A.J., Schwartz, "Money and Business Cycles" in Review of Economics and Statistics, Supplement, Feb, 1983, pp. 59-63
3. J. Tobin "Money Capital, and Other Stores of Value" in American Economic Review May. 1961.
4. D. Patinkin, Money, Interest and Prices.

5.12 Terminal Questions

Q. 1 Critically explain Balanced Budget theorem.

Q. 2 Describe port-folio disequilibrium and transmission mechanism.

*****

Unit - 6

CONSUMPTION FUNCTION

Structure

6.1 Introduction

We saw, in the previous lesson, that in the Keynesian model the level of output and employment is determined by the level of the aggregate effective demand. Therefore, in order to understand the behaviour of output and employment we, have to enquire into the behaviour of the aggregate demand. Since aggregate demand is broadly made up of two components, namely, consumption and investment, we should, first, study the behaviour of these components in order to have an understanding of the behaviour of the aggregate demand..

The theory of consumption function, which is the subject matter of the present lesson, attempts to explain the behaviour of consumption expenditure. This is a tool of analysis which was forged, first of all, by J.M Keyens and which, since then, has been further refined by a number of economists, notably by Duesenberry, Friedman, and Ando and Modigliani.

6.2 Learning Objectives

After going through this chapter you will be able:

- To understand Keynes' consumption function.
- To explain relative Income hypothesis.
- To explain permanent income hypothesis.
- To explain cyclical and secular consumption function.
- To understand port-folio disequilibrium and the transmission Mechanism.

6.3 Keynesian Consumption Function

The basic idea contained in the theory of consumption function is that there are a number of factors which influence the consumption expenditure of a community; but of all these, income is the single most important factor that determines the consumption expenditure, Keynes had assumed away the "money illusion" (money illusion may be said to exist when behaviour is guided not by the real values but by the money values of the variables involved). Keynes, by expressing his consumption function in terms of wage units [C_u =X(Y_w)] stipulated that real consumption is a function of real income.

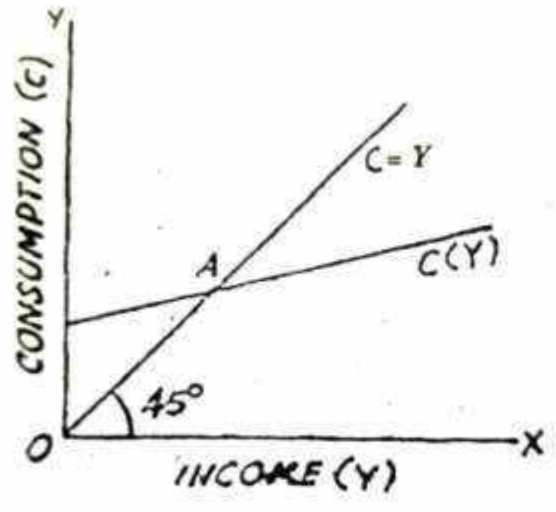


Fig. 6.1

Keynes's consumption function shows the following attributes apart from the above mentioned that real consumption is a function of real income. Firstly, relates current consumption to current income alone [$C_t = f(Y_t)$]. Secondly, it hypothesizes that consumption is a direct function of income so that it increases with a rise in income and decreases with a fall in income. Thirdly, although consumption increases with an in- crease in income, yet it increases by less than the in- crease in income. This implies that the marginal propensity to consume $\left(MPC = \frac{dC}{dY}\right)$ is less than unity. If the slope of the consumption function. This is shown by the consumption function, C (Y), in both Fig. 6.1 and Fig. 6.2 C(Y), in Fig. 1 (i) and Fig. 6.2 had been equal to the slope of the 45° line (C = Y line), the MPC would have been unity. But the slope of the C(Y) function in both the figures is less than that of the 45° line: hence they show a MPC less than unity. Keynes's consumption function does imply that MPC falls with a rise in income. In that case the consumption function C(Y), must be concave to the income-axis, like the C(Y) function in Fig. 6.2 above, the slope of which diminishes indicating a falling MPC with rising income. However, for the sake of simplicity, the C(Y) function is usually drawn as a straight line as in Fig. 6.1. A linear consumption function would suggest a constant MPC. Fourthly, average propensity to consume $\left(APC = \frac{C}{Y}\right)$ goes on diminishing with increase in income even when the MPC is constant. The CY) function makes a positive segment on the consumption-axis which shows that consumption expenditure of some minimum amount (measured by the said segment) has to be maintained even when income is zero. This amount of consumptions is said to be autonmous consumption as it is independent of the level of income. Moreover, as we move to the right of the break-even point A. where (C=Y), a gap between income and consumption expenditure develops and it goes on widening. The implication of it is that, unless this gap (which, in fact, measures the intended savings) a filled up with maintained. Fifthly, as it is obvious in the above diagrams, Keynes's consumption function is reversible; that is, consumption expenditure is assumed to fall with a fall in income along the same path by which it rises when income is increasing. Lastly, Keynes's consumption function is a short period consumption function; that is why it starts from above the origin making a positive, segment on the consumption-axis. In a short period consumption can be greater than income, but in the long period it must not exceed income.

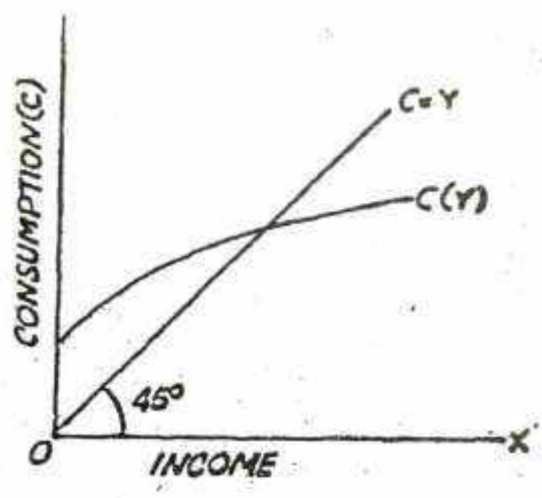


Fig. 6.2

An important point related to consumption function is as to what determines its position and slope. Its position is indicative of the absolute consumption expenditure at any given level of income from which we derive the average propensity to consume (APC). The slope, of course, in indicative of the rate at which consumption changes with a unit change in income (dC/dY); in other words, it gives us the marginal propensity to consume (MPC).

As observed by Keynes himself, the factors which determine the position and slope of consumption function may be classified into two categories: (i) objective factors and (ii) subjective factors.

Among the objective factors are included such factors as income, rate of interest, distribution of income, price level and price expectations, consumer's assets, deferred demand, terms of consumer credit and demographic factors.

We have already observed that income is the single most important factor determining consumption expenditure. The higher is an individual's income, the greater is the probability that his most urgent wants are conveniently satisfied; therefore, his propensity to consume a given increment. In his income would be less than that of an individual with a lower income, Extending this reasoning to the economy as a whole it may be said that the richer an economy is (in per capita income), the lower will be its MPC, so that the C-function of a rich economy would be flatter than that of a poor country. Similarly it can be discovered that the APC of a rich economy is less than that of a poor country.

Given the level of income, the proportion of it spent on consumption depends on the distribution of this income too. Since APC as well as MPC at a higher income are less than they are at lower incomes, any transfer of income from the rich to the poor is expected to increase APC as well as MPC of an economy. There- fore we can say that the more equal is distribution, the higher and steeper is the C-function, and the more un- equal is the distribution, the lower and flatter will be the C-function. However, the factors which generally govern distribution charge very gradually. Moreover, the factors which are more easily amenable to variation, such as the fiscal policy, have been empirically discovered not to influence distribution to a significant extent. There is a further consideration highlighted by Duesenberry's Relative Income Hypothesis, Keynes's C-function implicitly assumes that an individual's consumption is autonomous of the consumption of other individuals. But Duesenberry postulated that there is 'demonstration effect' in an individual's consumption; he generally emulates the consumption pattern of the more affluent individuals living in his neighbourhood. If distribution is made equal, the emulative consumption expenditure would be expected to fall rather than increase. When we take note of these qualifications, we may conclude that changes in distribution may not be of much consequence to C-expenditure, especially over a short period.

How does the rate of interest affect C-function? As we have already seen while discussing the Classical Model, (savings for its inverse, consumption), were assumed to be interest-elastic. A rise in the rate of interest was believed to make individuals consume less and save more, which can be explained in terms of the substitution effect. A rise in the rate of interest makes consumption more costly in comparison with savings, hence there is substitution of consumption with savings. A fall in the rate of interest will cause substitution effect in the opposite direction: more consumption and less savings. However, this line of reasoning ignores the income effect. A rise in the rate of interest has the effect of in- creasing future income and wealth. Due to income effect, therefore, an individual would have more of present consumption. It is generally recognised that people generally prefer present consumption to future consumption of an equal value and certainty. This will imply that savings for future consumption is an 'inferior' goods. Hence, if income effect is substantial, a rise in the rate of interest, at least beyond a certain level, will cause not a fall but a rise in C-expenditure. In the case of individuals, who interested in getting a fixed income from are their savings, any rise in interest rate will cause their savings to fall and consumption to rise. There is still another consideration. If the individuals are holding their wealth in the form of bonds, a rise in the rate of interest will reduce the bond prices and will thus reduce the wealth of the bond prices and will thus reduce the wealth of the bond holders. This may ultimately reduce C-expenditure. All these considerations show that the effect of changes in the rate of interest on consumption and savings is uncertain. On the whole this factor too may be of little quantitative importance for the C-function. The net conclusion with respect to the rate of interest is that short period changes are likely to be of secondary importance. But while moderate changes in the rate of interest are not believed to cause important shifts in the consumption function, Keynes is careful to point out that such changes may significantly affect the actually saved. A rise in the rate of interest may diminish investment and this will have the effect of reducing income. But if income falls the amount saved will diminish.

Micro-economics tells us that the consumption of a good is a function of its own price as well as of the prices of the related goods. We cannot transfer this conclusion mechanically to macroeconomics. The general belief is that if the general price level remains constant, but the relative prices change, it will increase the consumption of a good only at the expense of the consumption of another good or goods so that the aggregate C-expenditure may remain unaffected. Ackley does not agree with this proposition and holds that even changes in relative prices can influence aggregate C-expenditure. However, even he admits that there have been few hypotheses regarding its importance and direction.

But, if the general price level changes, it changes the real income of the individuals. A rise in price level reduces the real income. Therefore, if we rule out the presence of "money illusion" a greater proportion of in- come would be spent on consumption. The opposite will be the effect of a fall in the price level. If there is "money illusion" in people's consumption, that is, if they are guided by the level of their money income regardless of its purchasing power, C-expenditure would not be affected by changes in price level. It is doubtful if "money illusion" is quite common, though it may exist in isolated individual cases.

To introduce price expectations into the analysis of C-function is to make this analysis dynamic, while Keynes conceived it in static terms, his analysis of expectations being confined mainly to investment. How- ever, it can be found what is likely to happen if there are some sort of expectations with regard to the general price level. If, for example, it is expected to go on increasing in the future, people will be induce to get out of money into goods and, hence, C-expenditure as a function of income will rise very much. If the prices are expected to fall in future, people will tend to postpone their consumption, thus reducing their aggregate C-expenditure at any given level of income.

The analysis of the effects of changes in price level suggests that Keynes's assumed stability of C-function may prove to be fictitious in an environment of frequent changes in price level.

In so far as the consumption of an individual depends not only on his current income but also on his wealth, the value of consumers' assets also influence C- expenditure. These assets are of two kinds: financial and non-financial. Assets in the form of cash, demand deposits, saving deposits, stocks and bonds are financial assets. Non-financial assets are all types of physical property owned by consumers such as land, buildings and consumers durables of all types. It can be argued, on the basis of the law of diminishing marginal utility, that larger is the value of the financial assets held, the smaller is the urge to add more to these assets. It may, therefore, result in increased C-expenditure; that is to say, the consumption function may shift upward, However, this relationship may not be as simple as it appears to be, for much depends on the distribution of these assets. If their ownership concentrated in the hands of a small class of rich people, an increase in the financial assets or in the value of these assets may not increase C-expenditure significantly, because the rich usually do not save at the expense of their consumption. Secondly, the changes in the volume of financial assets are not important. What is important is their real value which depends on the price level. If a fifty percent rise in the money value do the financial assets is accompanied by a fifty percent rise in the price level, there would be no change in the real value of the financial assets, and, hence, unless the assets holders suffer from "money illusion", there will be no effect on C-expenditure. On the other hand, even if the money value of the financial assets remains constant, their real value will rise with a fall in the price level, which may raise the C-function. This effect to a fall in price level is now referred to as the Pigou Effect. So, we can say that changes in the real value of financial assets held by the people, whether they come about through changes in their money values with level remaining constant, or rising less than the increase in money value, through fall in the prive level, do shift the C-function, though one cannot be quite certain about the magnitude of this shift.

The effect of increase in consumers' non-financial assets appears to work in the opposite It savings from income after spending on consumer's non-durables, that is either to be saved or spent on consumers' durables. The greater is, the stock of consumers' durables with the consumers, the less will be the amount of expenditure on these durables and the greater will be the amount saved. Moreover, most of these durables tend to reduce consumers' expenditure on non-durables too. For example, the possession of a car reduces the family's expenditure on taxi-fall. However, at the same time, it may create consumption expenditure on petrol. Though quantitative studies of this problem are not available, yet the general presumption is that an increase in the stock of consumers' durables, on the whole, reduces the C-expenditure at any level of income. That this is the presumption among the actual producers of consumers's durables too is evident in the fact that they very frequently change the models of such goods in order to make them obsolete long before the expiry of their useful life.

Deferred demand is another objective factor influencing the position of C-function. If, due to certain controls, the consumers are not able to satisfy their demand for goods and are thus forced to postpone their demand, their C-expenditure will rise abruptly as soon as these controls are removed. This is what happened in most of the countries in the post-war period.

In advanced countries with hire-purchase system, through which consumers are able to get credit for the purchase of durables, the terms of such credit can also influence C-expenditure. A relaxing of these terms will increase and a tightening of these terms will decrease the C-expenditure.

Demographic changes too can influence C-expenditure. A rise in the proportion of non-earning dependent people, such as children and old people, in the total population will have the effect of raising C-expenditure. A fall in this proportion will have the opposite effect.

Under the subjective factors determining C-function, Keynes listed the various motives for saving and consumption, such as security motive, desire to 'keep up with the Joneses', the desire for improvement and financial prudence. While the desire for security and improvement as well as financial prudence tend to lower the C-function, the desire to 'keep up with the Joneses' and the desire to maintain the accustomed standard of living- the two factors which are assigned the key role in Duesenberry's Relative Income Hypothesis that we shall discuss shortly- tend to raise the C-function.

Keynes assumed that C-function is fairly stable. In fact, C-function is as much stable as the various objective and subjective factors that determine it. Keynes believed that all these factors remain stable over a short period. So, he assumed C-function to be a stable one.

Self Check Exercise-1

Q1. Diagramatically Discuss Keynesian consumption function.

6.4 Relative Income Hypothesis:

Keynes's C-function, as we have seen, relates C-expenditure to the absolute level of income. An important refinement introduced in the theory of consumption function after Keynes is to make a family's C-expenditure a function not of its absolute level of income but of its relative income, Duesenberry consolidated this hypothesis in his Income, Saving, and the Theory of Consumer Behaviour (1949). According to this hypothesis, the proportion of income spent by a family on consumption depends on the level of its income relative to the income of the families falling within its own income-class, the families "with which it identifies itself economically. If its income rises, while the incomes of the other families in this class remain constant, the fraction of its income spent on consumption will fall. If its income remains constant, but the incomes of the other families rise, its relative income falls and, hence, it will devote a large proportion of its income to consumption in order to "keep up with the Joneses." On the other hand, if the incomes of all the families in a given class change together such that their relative income positions remain unchanged, the proportion of any family's income devoted to consumption will also remain unchanged.

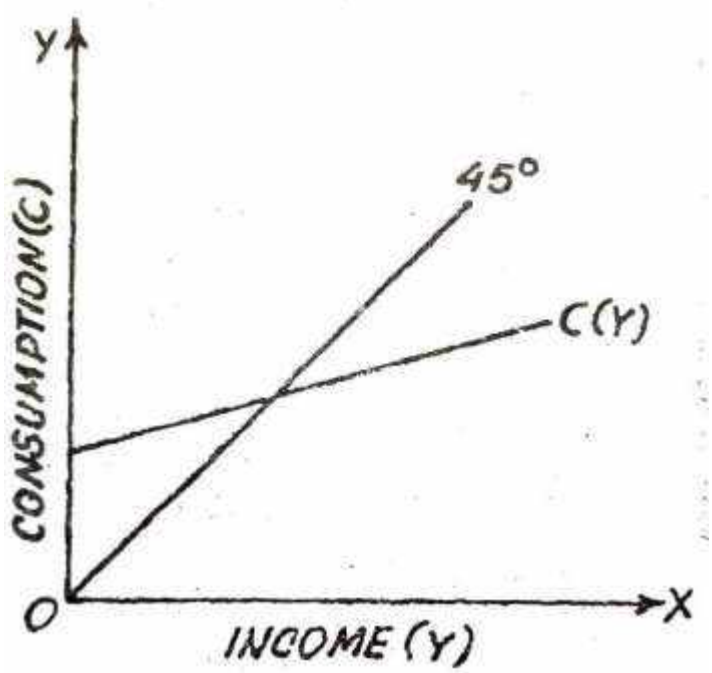


Fig. 6.3

It is obvious that the Relative Income Hypothesis assigns a key role to the motive for 'keeping up with the Joneses' in shaping the C-function and thus emphasises the importance of the emulative type of consumption. It spells out the implications of the 'demonstration effect' for the C-function.

How does it modify Keynes's Absolute Income Hypothesis? It is obvious that, according to the Relative Income Hypothesis, an increase in absolute income level by itself cannot cause a fall in the propensity to consume as is suggested in Keynes's theory of C-function. Similarly, a decrease in the absolute income level of a family by itself not its propensity to consume. It is only when a family's income increases or decreases in relation to the income of other families on its income-class that its propensity to consume will fall rise. Its implication for the aggregate C-function is that provided the class distribution of income does not change, a change in income will not change the average propensity to consume. C-function will be like the C(y) function in Fig. 6.4 rather than that in Fig. 6.3.

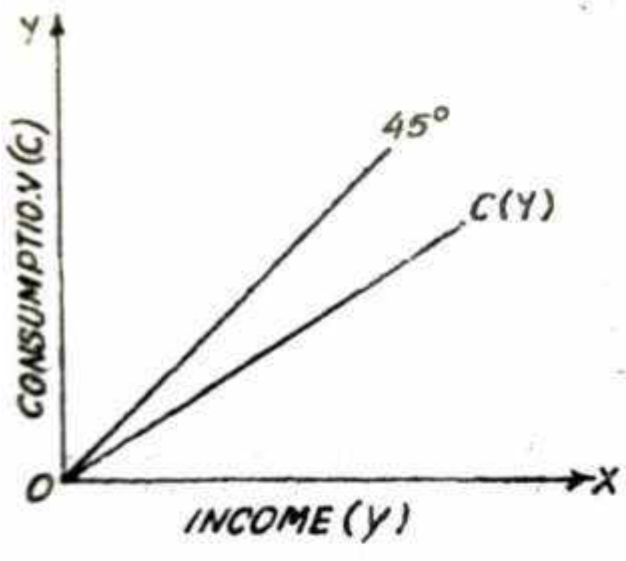


Fig. 6.4

Self Check Exercise-2

Q1. What do you mean by relative income hypothesis?

6.5 Permanent Income Hypothesis.

Another refinement introduced in the theory of C-function' since Keynes is Friedman's Permanent Income Hypothesis. The Absolute Income Hypothesis of Keynes as well as the Relative Income Hypothesis of Duesenberry focus attention on "current" income and seem to carry the impression that the measured consumption pertaining to a period is a function of the measured income of that period or, if we assume time lag, of the previous period. Friedman, in his A Theory of the Consumption Function (1957), argues that a family does not reduce its consumption in the current period, if its income for that period or for the period preceding it diminishes. Similarly a family will not increase its consumption in the current period if its income for that period or the preceding period increases. Thus Friedman has tried to substitute the concept of 'current' income and 'current' consumption with his new concept of 'permanent' income and 'permanent consumption'. His Permanent Income Hypothesis seeks to relate 'permanent' consumption to 'permanent' income.

According to this hypothesis, the observed or measured income in any period has usually two components: the 'transitory' and the 'permanent'. The 'transitory' component is due to windfall gains or losses which can- not be expected to repeat themselves regularly and to the same extent. If there are net windfall gains in a particular period, the 'transitory component is positive and, therefore, the measured income is greater than the 'permanent' income. On the other hand, if there are net chance losses the 'transitory' component is negative and, therefore, the measured income is less than the 'permanent' income. Similarly, Friedman distinguishes between 'transitory', consumption and 'permanent' consumption. An unplanned purchase of a good on account of an unexpected, attractive bargain will represent a positive transitory' component in the measured consumption of the given period. The postponement of a planned purchase of a good on account of its non-availability in the market will represent a negative 'transitory' component in the measured consumption.

A difficulty about this hypothesis is that it is not statistically possible to isolate the 'permanent' from the 'transitory' income. However, an idea of a family's 'permanent' income can be had as follows: Find out the present capitalised value of the family's expected future income stream as we did in our lesson No. 1, section 3 while discussing the micro foundations of macroeconomic theories of consumption expenditure; add to it the accumulated wealth of the family. The annual interest that can be earned by the family on this total amount may be regarded as its 'permanent' income.

Having explained the basic concepts of this theory, we can now enunciate this hypothesis as follows: The 'permanent consumption varies directly in proportion with the 'permanent' income so that the ratio of 'permanent' consumption to permanent' income is independent of the level of this income: this ratio being determined by other factors, namely, the rate of interest, the ratio of "non-human" wealth to total wealth (human plus "non-human" wealth), and tastes. This would imply that provided the factors determining this ratio are the same for the rich and the poor, the proportion of 'permanent' income devoted to 'permanent' consumption would be the same for both.

The Permanent Income Hypothesis of Friedman is a highly formalised theory raised on the implicit assumption that the householders plan their C-expenditure through minute rational calculations and that their objective is to plan their consumption not for the current period or the period ahead but for almost the whole expected life span of a householder. It is, therefore, assumed that the householders seek to smooth out their consumption. Many would question the realism of this assumption. In the case of low-income families, at least, the preference for present consumption over future consumption is greater than it is for the high-income families. Whatever be the desire of the former to prevent their future consumption falling below even the presently low consumption, it is doubtful if they are in a position to save the same proportion of their income as the latter.

Another implication of this hypothesis is that the 'transitory' consumption is independent of the 'transitory' income or that the marginal propensity to consume the 'transitory' income is zero and the whole of it would be saved, and if the transitory income is negative, the C-expenditure would not be reduced. It is hard to believe that this implication of the hypothesis is consistent with facts. For, as Houthakker observed in his "The Permanent Income Hypothesis" (AER. June 1958), thus would suggest that "The man who has a lucky day at the races does not buy his friends a drink, and the poof fellow whose wallet in stolen does not postpone the purchase of a new overcoat."

Self Check Exercise-3

Q1. What do you mean by Permanant income hypothesis?

6.6 The Cyclical and the Secular Consumption Function

The statistical studies of income-consumption relationship have revealed that while the APC is inversely related with, the level disposable income over a short period or durings a business cycle, over a longer period the APC is constant and is thus independent of the level of disposable income. For example, The National Income and Product Accounts of the United States. 1929-1965, shows that APC rose during the Great Depression from 0.927 in 1929 to 1.005 in 1933 after which it began to fall once again with the recovery. But, in 1948 it was 0.917; in 1958 it was 0.910: and in 1968 again it was 0.910. Thus, we find that the short-period or the cyclical behaviour of the C-function is at variance with the secular behaviour. Therefore, one of the tasks faced by the theory of C-function is how to make the cyclical behaviour of C-function consistent with its secular behaviour. The cyclical or the short-period C-function makes a positive segment on the consumption-axis OY like the function $S_1S_2S_3$, in Fig. 6.5 But the secular C-function is a straight line starting from the origin like the C-function OL in Fig. 6.5.

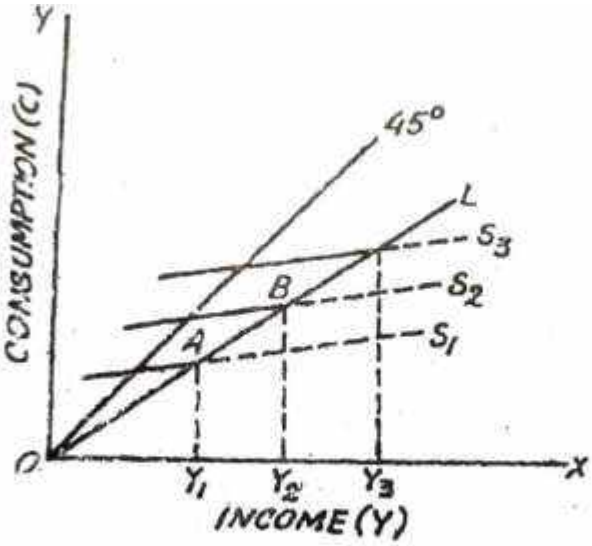


Fig. 6.5

The Keynesian theory of the C-function proposes that APC falls with rising level of absolute income and rises with falling. Absolute level of income. The followers of the theory seek to reconcile this proposition with the secular empirical C-function by appealing to changes in factors other than real income on account of which the short-period C-function drifts upward over the secular period. It is suggested by Hansen that upward shift might be caused by changes in prices, per capita productivity and population so that if corrections are made for these changes, "the C-function of two periods, widely separated in time, can be made comparable." He observes that the upward shift of the C-function is due to rise in the customary standard of living which itself is the result of the secular rise in income. Therefore, in his opinion, it is wrong to interpret the historical data showing an upward drift of C-function to mean that C-function is autonomously determined so far as the long-run relationship is concerned. However, it should be appreciated that the upward drift of the C-function may come about as a result not only of the secular rise in income and the attendant rise in the standard of living but also of the increase in the accumulated wealth of households, the movement of population from the rural to the urban areas, the increase in the proportion of old people in the total population and the introduction of new products.

The role played by the above factors in causing the upward shift of the short-period consumption function cannot be denied. But the above explanation also assumes that these factors shift the short-period C-function exactly to the extent necessary to maintain a proportional relation between income and consumption over the long run. This assumption is rather hard to swallow.

Duesenberry's Relative Income Hypothesis which, when extended to explain the aggregate behaviour, stipulates that consumption in the current period (t) is a function not only of the income of the current period (t) but also of the income of the previous peak period (t_0). The aggregate behaviour suggested by the Relative Income Hypothesis may be expressed in a single C-function that combines the properties of the long run function, $C_1 = bY_1$, and the short-run function, $C = a + cY_1$, as follows: $C_1 = Y_0$ (b–c) +cY where Ct and Y_1 refer to the consumption and income of the current period, and Y_0 refers to the income of previous peak period. The basic idea of this theory is that people tend to defend that standard of living to which they become accustomed. Therefore, if income falls from the peak level, the in their attempt to defend their customary standard of living, reduce their C-expenditure proportionately less than the fall in income. For example, if, in Fig.6.5 income falls from Y_1 the consumption is decreased along the S_1 function, and if the income recovers from this fall, consumption is increased along this very function till the previous peak level of income Y_1 is regained. If there is a further rise in income above this peak level Y_1, the consumption increases along the steeper consumption functions L. For example, if the income increases from Y_1 to Y_2 consumption moves from A to B along the secular C-function L. If, now, there is a fall in income from level Y_2, consumption will be decreased along the flattrer C-function S_2 When there is recovery towards the previous peak level Y_2, consumption increases along this S_2 function. But, if the income rises beyond this peak to Y_3, consumption again moves along the steeper secular C-function L. Thus, there is a sort of a "ratchet effect" on account of which the short period C-function is pushed upwards over the secular period. The fall in C-expenditure during the recession is less than the increase during the boom.

Let us come back to the formula stated above. As long as income is steadily rising as in boom periods, $Y_1=Y_0$ and the combined function reduces to $C_1= bY_1$ that is consumption increases along the proportional C-function L in Fig. 6.5 above If $Y_1<Y_0$ due to recession, Y_0 is constant. This will make Y_0 (b-c) too constant. We may substitute it with the constant a[$=Y_0$ (b-c)]. The above combined equation [$C_0 = Y_0$ (b-c) + cY_1] then becomes. $C_t = a + cY_t$ which is the equation of the short run function like $S_1S_2S_3$....... This implies the same tendency that we described above in words, namely, that during recession and recovery, the C-expenditure change along the flatter functions like $S_1S_2S_3$.......... showing that consumption changes less than in proportion with the income,

In terms of the Permanent Income Hypothesis it can be said that short-period C-function, like $S_1S_2S_3$........ in Fig. 6.5 above, are possible only if they relate measured consumption to measured income. If 'permanent' consumption is related to 'permanent' income, the C-function will be proportional like the L function in Fig. 6.5

It is the opinion of some economists like Shapiro that the problem of reconciling the short-period consumption behaviour with the long-period consumption behaviour is not even posed in Friedman's theory. As Shapiro observes, 'As long as we are dealing with permanent income and permanent consumption, the argument of the permanent income hypothesis is that the response of consumption to income will be a proportional one. The non proportional SR curves (like $S_1S_2S_3$, in our Fig. 6.5)......do not exist in this case because the response of consumption to permanent income is the same in the short run as in the long run. There is no problem of reconciling the result found in the short run and in the long run as there was for the relative and absolute income theories, because here the response is proportional." (cf Macroeconomic Analysis, p.139).

However, some other economists like Dombusch and Fischer have attempted this reconciliation on the basis of the permanent income hypothesis by introducing rational expectations as follows.

Although there is no simple theory of formation of expectations, nevertheless it can be assumed that if changes in income are typically permanent or long run changes,then the consumers experienceing a change in their income would tend to regard it as a permanent change. Now, the permanent income measure, following Dornbusch and Fischer, can be written as follows:

(1) $Yp = Y_{t-1} + \theta\ (Y_1 - Y_{t-1})\ 0 < \theta < 1$

or (2) $Yp = \theta Y_t + (i - \theta)Y_{t-1}$

Where Yp is permanent income; Y_{t-1} is measured income of previous year. Y, is measured income of the current year, and 0 is a fraction ($0 < \theta < 1$) of the previous year's increase in measured income that is added to the income of the current year in order to find out permanent income in a very simple case.

If we combine the above equation (2) with the general equation of the permanent income hypothesis, namely, C=cYp, we have the following equation:

(3) $C = cYp = c\theta Y_t + c(1-\theta)\ Y_{t-1}$

The above equation (3) implies that the marginal propensity to consume out of current income (Y_1) is $c\theta$. Since $0 < 1$, therefore which $c\theta < c$ which means that the short-run marginal propensity to consume is less than the long-run marginal propensity to consume (which is related permanent income Yp and is therefore $c > 0\ c$). This is what is implied in our diagram of Fig. 6.5 above.

The reason for the short-run marginal propensity to consume being less than the long-run marginal propensity to consume is that when the current income rises, the consumer is uncertain if this increase is permanent. Therefore he will not immediately adjust his consumption expenditure to this higher level of income. But, if this increase turns out to be a lasting one, then the consumer will regard it to be his permanent income and he will now fully adjust his consumption to this higher level permanent income.

However, there is one shortcoming in the explanation of Dornbush and Fischer. Their analysis overlooks the distinction made by Fried man between permanent consumption and measured consumption. In their presentation of Friedman's permanent income hypothesis, it is the measured consumption rather than the permanent consumption which is shown to be the function of permanent income.

Self Check Exercise-4

Q1. Discuss Cyclical and secular consumption.

6.7 Summary

Keynes presented the absolute income hypothesis which was outerlly derived from his psychological Law. It puts forth three implied generalisations : (i) The current absolute consumption is related to the current real income $C_t = f(Y_t)$. (ii) the consumption income relationship is reversible, i.e. the people will reduce consumption when their income falls exactly along the some path as is followed when there is rise in income. (iii) consumer's spending patterns are determined autonomocisly and the consumption pattern of one group of consumers is quite independent of that of others.

J.S. Duesenberry Lays stress on relative income of an individual rather than his absolute income as a determinant of consumption of an individual is not the function of his absolute income but of his relative position in the income distribution in a society.

Permanent income has been defined by Milton Friedman as the amount which the consumer unit could consume while maintaining its wealth intact. Wealth has been defined as the discounted seen of all future receipts of income from non-human assets. The permanent income is, thus, that level of income which, if received in perpetuity, has a discounted value just equal to wealth.

The Life Cycle Hypothesis has been developed by F. Modigliani, R. Brumberg and A. Ando. This attempts to reconcile the long-run proportional and short-run cyclical consumption behaviour of the people.

6.8 Glossary

There various factors responsible to determine the propensity to consume. Let us now discuss the various factors which govern the propensity to consume. The propensity to consume shall be determined by the following factors.

(i) Money income

(ii) consumer credit

(iii) Distribution of wealth

(iv) Price and wage levels

(v) Changes in consumer's Tastes and Fashions

(vi) Wind fall gains and losses

(vii) Fiscal policy

(viii) Change in Expectations

(ix) The level of consumer's indebtedness

(x) Attitude of thrift.

(xi) Holding of Liquid Assets

(xii) Stocks of durable goods on land

(xiii) Business policies of corporations

(xiv) Social insurance

(xv) Rate of Interest

(xvi) Demonstration effects

6.9 Answers to self check exercises

Self Check exercise -1

Ans.1. Refer to Section 6.3

Self Check exercise -2

Ans.1. Refer to Section 6.4

Self Check exercise -3

Ans.1. Refer to Section 6.5

Self Check exercise -4

Ans.1. Refer to Section 6.6

6.10 References/ Suggested Readings

1. E. Shapiro, Macroeconomic Analysis Ch. 8 and 9.
2. Dernberg and McDougall, Macroeconomics Ch. 5.
3. G. Ackely, Macroeconomic Theory ch. 10-12
4. J.M. General Theory Ch. 8-10.
5. A.H. Hansen, Guide to Keynes Ch. 3-4.
6. J.S. Duesenberry, Income, Saving and Theory of Consumer Behaviour.
7. R. Dombush and S Fischer, Macroeconomics, Ch. 8, pp. 278-283.
8. W.H. Branson, Macroeconomic Theory and Policy, Ch. 10. pp. 195-200.

6.11 Terminal Questions

Q. 1 Critically explain the purpose of the Keynesian consumption function and show the retirements which have been made in its use in recent years.

*****

Unit - 7

LIFE CYCLE THEORY OF CONSUMPTION

STRUCTURE

7.1 Introduction

As we pointed out earlier also, in the conventional Keynesian macro theory of consumption expenditure the consumption of current period is assumed to be the function of the income level of the current period. This has obviously the implication that if the income of the current period falls to zero, then the consumption expenditure of the current period will be not more than the autonomous consumption (a) as indicated in the Keynesian consumption function, C=a+bY. In case we assume a lagged Keynesian function with one-period lag so that C_t $a+by_{t-1}$ even the implication is that the consumption expenditure of the current period will be no more than the autonomous consumption if the income in the preceding period fell to zero. However, this hypothesis is considered to be unrealistic, not conforming to everyday facts of life. In observed life, the critics of this hypothesis point out, consumption expenditure of a family in the current period does not fall to the level of so-called autonomous consumption, if the income of the current period or the preceding period falls to zero. It is claimed that the consumption expenditure of families in real life shows a much smoother flow than what is implied in the conventional Keynesian consumption function and other theories akin to it like the Relative Income Hypothesis of Duesenberry.

The above critique of the conventional macro theory of consumption expenditure has led to the evolution of alternative hypotheses which seek to relate the consumption expenditure of the current period not to the income level of the current period or of the preceding period but to some longer-run measure of income which is supposed to be the "normal" level of income Such hypotheses in the macro theory of consumption have come to be known as the normal-income hypotheses. The most notable examples of this class of hypotheses with regard to the consumption behaviour are Friedman's Permanent Income Hypothesis, which we have already explained in the proceeding lesson, and the Life Cycle Hypotheses developed notably by Modigliani, Ando and Brumberg. In the present lesson we are going to explain the main ideas contained in the Life Cycle Theory of consumption behaviour. We propose to accomplish this task in two steps. In the first step we shall give a rather simplified version of this theory so as to bring out clearly its most salient idea. Later on, at the second stage, we shall consider a more complicated version of it.

7.2 Learning Objectives

After going through this chapter you will be able:

- To understand the Life Cycle Theory of Consumption
- To understand Life Cycle Model without Wealth
- To understand Life Cycle Model with Wealth
- To understand the Model with Borrowing and Lending
- To understand the Wealth effect on Consumption

7.3 The Life Cycle Theory of Consumption

The life cycle theory of consumption behvaiour as developed by Modigliani in collaboration with Ando and Brumberg is based upon a few simple assumptions. One of its underlying assumptions is that the life-time consumption of an individual family depends on its life-time income. Secondly, it takes into consideration a rather empirical fact that while the income stream of a typical individual family is uneven over life time, the consumption flow over life time is rather relatively much smoother. The life-cycle theory rationalises this observed behvalour with the help of the assumptions of the conventional micro theory of consumption in which a consumer is assumed to be behaving rationally in the sense of seeking to maximise his utility function. Now, if the life-time income has an uneven flow and if consumption of the current period is the function of the income of the current period, then obviously the consumption expenditure of an individual will also have an uneven flow. Uneven flow of consumption implies smaller consumption in years when income level is low and higher consumption in years when income level is high. Unequal consumption over life-time will yield unequal marginal utilities of consumption expenditure in different time periods. But the famous law of equal-marginal utility which states the pre-conditions of maximising utility function of 2 consumer lays down that utility is maximum when marginal utilities are equlised. This law is assumed in the Life-cycle Theory of Consumption behaviour to apply not only to different goods as such but also to consumption expenditure of different time periods. This means that this theory assumes a typical individual to be planning rationally his life-time consumption and saving. He is assumed to know it conciously or unconciously that an even and smoother flow of consumption over time even when the income flow is uneven will give him much more total utility than when he relates his current consumption to the uneven flow of current income. This leads to and explains the basic assumption of this theory, namely, that, while the income per unit of time, say per year, of a typical individual is low in the beginning of earning life as well as towards the ending stage (retirement) of life, the year-to-year consumption over life time is rather a more or less constant or, may be, a slightly rising stream as shown in Fig. 7.1.

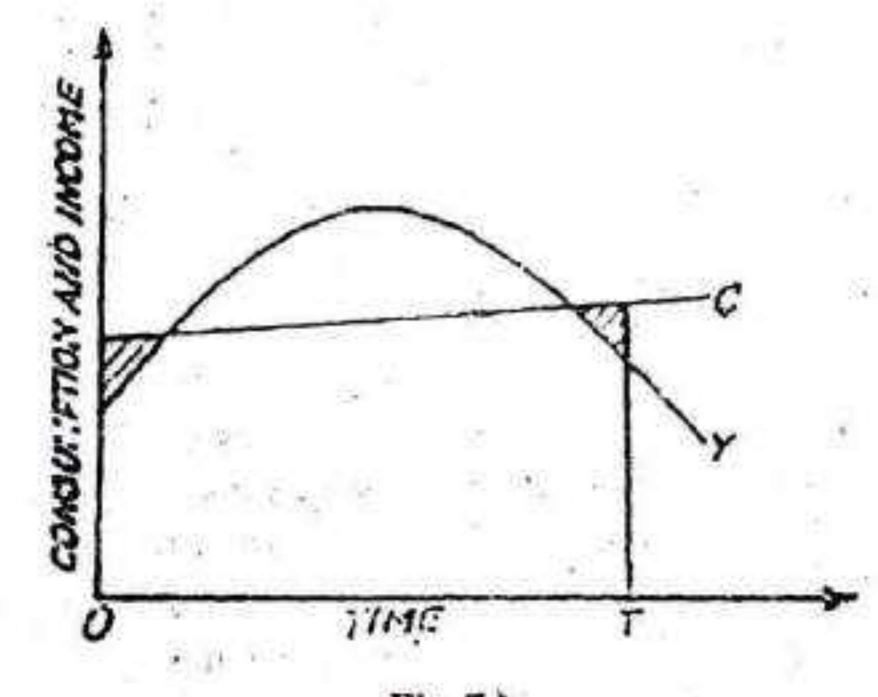


Fig. 7.1

In the above figure (7.1), OT is the expected life span of an individual. The Y-curve shows an uneven flow of income over life time and C-curve shows a slightly rising consumption flow over life time. The shaded area on the left side of the humped Y-curve as well as to the right of it represents dis-saving over life time, while the blank area between the Y-curve and the smooth C-line represents saving. This implies that a rational individual consumes more than his current income during the initial and the final period of his life and consumes less than his current income during middle period of his life.

Moreover, the theory also implies a sort of budget constraint or consumption possibilities. This budget constraint implied in the theory is that the life time consumption cannot exceed life-time income.

Under the above assumptions and an additional simplifying assumption that there is neither inheritance nor bequests, that is, the individual neither receives any wealth as inheritance nor leaves any wealth for his heir, or anyone else, the Life-cycle Hypothesis visualises that consumption is a proportionate function of the life-time income. In other words, the consumption function in this theory under the above simplying assumption is of the following type.

(1) $C = cY_L$

Where C is consumption expenditure; Y_L is the income earned from labour, that is, Y_L does not include property income like rent and profits, and C is the proportionality constant which represents both the marginal propensity to consume as well as average propensity to consume.

However, if we introduce the real wealth variable also, the Life-Cycle Hypothesis on consumption behaviour takes on the following form:

(2) $C = W_R + Y_L$

Where W_R represents the amount of real wealth and the coefficient a represents the proportion of W_R that is spent on consumption. Now we shall explain how the Life-Cycle Theory of consumption behaviour arrives at the relationship expressed in equations (1) and (2) above. To start with we shall take up a rather simple model in which inheritances and bequests are resumed away which implies assuming away the wealth variable and assuming only non-property income, that is, only labour income (wages and salaries).

Self Check Exercise-1

Q1. Discuss The life cycle theory of consumption.

7.4 Life-Cycle Model Without Wealth:

We have already explained in the preceding restion that the budget constraint implied in the Life-Cycle. Theory of consumption behaviour is that the life-time consumption equals life-time income. Now, let us represent the life span expected by an individual by K_L and the span of his expected writing life by W_L and consequently, the life expected to be lived in retirement by $K_L–W_L$ We assume that there is no borrowing and lending, and hence no interest seemed on ravings. Under these assumptions the above said budget constraint of the Life-Cycle Theory can be written as follows:

(3) $C, N_L = Y_L, W_L.$

C in the above equation is average consumption per period (year) over the whole life span N_L. Therefore C, N_L represents life-time total consumption. Similarly, Y_L is the average labour income per period (year) spread over the whole span of working life W_L. This means that $Y_L W_L$ represents the life-time income which under the assumed budget constraint, must equal the life-time consumption, $C.N_L$. This explains the equation (3) above.

Now, dividing equation (3) by N_L, we get

(4) $C = \frac{W_L}{N_L} Y_1$

Equation (4) above is the same as equation (1) above except that the equation (4) gives us an exact information regarding how the value of the proportionality coefficient c of equation (1) is determined. It clearly tells us that the value of c equals the ratio between the expected length of the working life (W_L) and the expected length of the physical life (N_L).

Thus the equation (4) can be written as follows:-

(5) $C = cY_L$ where $c = \frac{W_L}{N_L}$

It should be noted that the Life-Cycle Theory of consumption behaviour is ipso fact also the Life-Cycle Theory of saving behaviour.

(4) Life-Cycle Model of Saving

Saving in the above model may be expressed as follows:

(5) $S=Y_L-C$

Where S is the average life-time saying done per period (year); Y_L is the average life-time income per period (year); and C is the average life-time consumption per period (year)

We know from equation (4) that $C= \frac{W_L}{N_L}.Y_L$. Therefore equation (6) can be rewritten as follows:

(7) $S = Y_L \left(1 - \frac{W_L}{N_L}\right)$

or (8) $S = Y_L.\frac{N_L - W_L}{N_L}$

We know that $N_L – W_L$ is the length of life expected to be spent in retirement, while N_L is the expected span of physical life. Therefore the equation (8) above explaining the saving behaviour of the Life-Cycle Theory can be expressed as follows also:

(9) $S = s, Y_L$

where $s = \frac{N_L - W_L}{N_L} = \frac{\text{Expected Retired Life Span}}{\text{Expected Physical Life Span}}$

The above result implies that the average life-time saving is a constant fraction of the average life-time income showing a proportional relationship between the two variables. The proportionality constant s represents both the marginal and the average propensity to save and it equals the ratio between the life-period expected to be live in retirement and the expected span of physical life. Since the former is less than the latter, it also tells us that the marginal and the average propensity to save is less than one.

Self Check Exercise-2

Q1. Discuss Life-Cycle Model without wealth.

7.5 Role of Assets

When there is positive saving, it will be invested in the acquisition of income-yielding assets. Thus there is accumulation of assets or wealth which is used to finance consumption during retirement, according to the Life-Cycle Theory. This theory thus predicts that people save a lot when their current income is high in relation to the life-time average income, and they dis-save when their current income is low in relation to the life-time average income.

The life-time pattern of consumption, saving and dis-saving is captured in the following diagram of Modigliani which assumes a constant stream of consumption over life time.

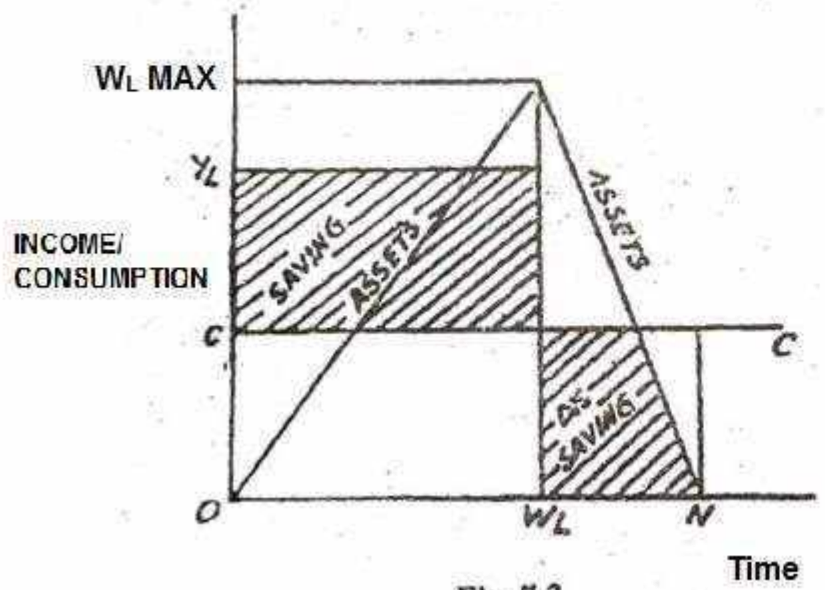


Fig. 7.2

The above Fig. 7.2 shows that consumption over expected life-time is done at the average rate of OC along the horizontal CC line. Saving is done during the working life W_L and assets are built up upto the maximum of W_L Max W_L N_L is the retirement period of life during which there is supposed to be no income (Y_L) but consumption (OC). This consumption takes place out of accumulated assets or saving which implies dis-saving during the retirement period of life.

7.6 Life-Cycle Model with Wealth

Now let us introduce the wealth variable also along with the labour income. Let T be a particular point of time when the individual receives wealth, say, in the form of an inheritance. Then the budget constraint will take the following form:

(10) $C(N_L\text{-}T)=W_R+ (W_L\text{-}T)\ Y_L$

Where W_R represents real wealth. The other symbols represent the same variables as in the earlier cases described above. It follows from the above equation (10) that

(11) $$C = \frac{1}{N_L - T} . WR + \frac{W_L - T}{N_L - T} .Y_L$$

which relation can be rewritten as follows also:

(12) $C = aW_R + cY_L$

where $a = \frac{1}{N_L - T}$. and c $\frac{W_L - T}{N_L - T}$

The above conclusion is the same as stated in equation (2) above except that equation (12) also tells us the exact determinants of the values of proportionality constants a and c.

The whole of the above discussion leads us to the following important conciusions :

(1) Consumption is done by individuals at a constant rate over life time.

(2) Consumption expenditure is financed by life-time income plus initial wealth.

(3) During each year a fraction equalling $\frac{1}{N_L - T}$ of real wealth is consumed where N_L is the individual expected physical life.

(4) Current consumption expenditure of an individual depends on current wealth and life-time income.

Self Check Exercise-3

Q1. Discuss Life-Cycle Model with wealth.

7.7 The Model With Borrowing And Lending

We had earlier assumed that there is neither borrowing nor lending and therefore there was no question of the existence of interest. Now we shall make our presentation of the life-cycle model more realistic by dropping this assumption and admitting borrowing and lending and also interest into our model.

The life-cycle model works with the observed fact that consumption takes place over time and so does also the flow of income. Moreover, when borrowing and lending are introduced, it becomes possible for an individual to save and lend now in order to consume in some future period and also to borrow and consume now against future income. This obviously affects the consumption possibilities on the budget constraint. The bud- get constraint in this case, then, would be that the present value of the individual's total consumption over life time cannot exceed the present value of his total life time income. In mathematical language it implies that:

$$(13) \quad \sum_{0}^{T} \frac{Y_t}{(1-r)^t} = \frac{C_t}{(1-r)^t}$$

where T is the individual's expected life time and r is the rate of interest.

The above constraint of equation (13) implies that the individual can allocate his income steam to a consumption stream by borrowing and lending at the current rate of interest, but the present value to his life-time consumption is limited to the present value of his life- time income. However, here again it is assumed that there is no inheritance received and no bequests made by him.

In order to bring out the effect of borrowing and lending at a positive rate of interest we shall take a simple two-period case in which an individual has an income stream of Y_0 and Y_1. The rational individual is assumed to maximise his utility function V (C_0, C_1) subject to the borrowing lending constraint:

$$(14) \quad C_0 + \frac{C_1}{1-r} = Y_0 + \frac{Y_1}{1-r}$$

The left hand side of the above equation represents the present value, of life-time consumption, and the right-hand side represents the present value of life-time income.

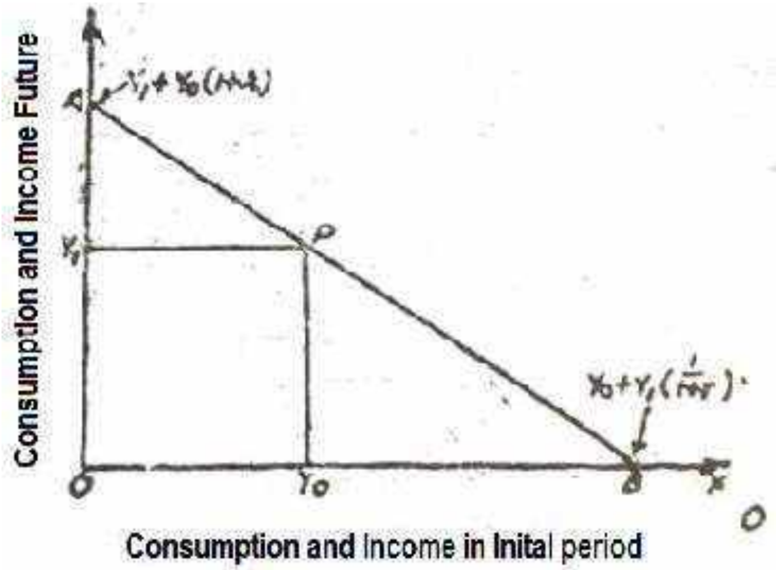


Fig. 7.3

In Fig. 7.3 above the point P gives the pattern of income flow over time Y_0 in the present period 0 and Y_1 in the future period 1. The straight line AB represents the budget constraint when there is borrowing and leading but no inheritance and bequest. The point A on the vertical axis represents the maximum consumption possibility in the future period 1 which equals the sum of the expected income of that period plus the future value of present income of period 0 when the individual takes the most extreme decision to save the whole of his present income Y_0 and lend it at r rate of interest to get it back with interest in the next period 1. This future value of the present income will thus amount to Y_0 (1+r). Hence the maximum consumption possible in future (period 1) equals Y_1+Y_0 (1+r). The point B on the horizontal axis, on the other hand, represents the maximum consumption possibility in the present period 0. This equals the sum of the present income Y_0 plus the present value of the future-income of period 1 when the individual takes the most extreme decision of borrowing and consuming now fully against the income expected to be received in the future period 1. The maximum borrowing against the future income cannot exceed the present value of the future income. Hence the maximum borrowing will equal $Y_1 \left(\frac{1}{1-r}\right)$ and thus the maximum consumption possible in the present period 0 equals $Y_0 + Y_1 \left(\frac{1}{1-r}\right)$

Now, if we super-impose the indifference map of the individual showing his time preference for consumption on the budget constraint AB of Fig. 7.3 above we shall have a diagram of Fig. 7.4 below.

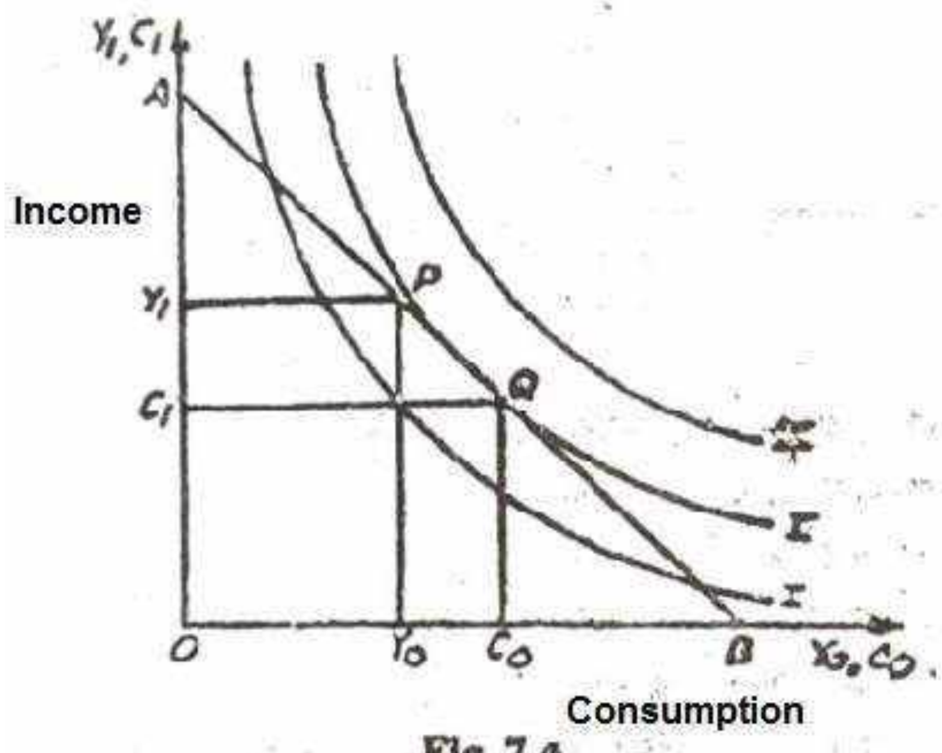


Fig. 7.4

We know it from the microeconomic theory of consumer behaviour that the consumer is in equilibrium, that is, he gets the maximum utility at a point where the budget line becomes tangent to one of his indifference curves. Therefore, in terms of Fig. 7.4 above, our individual will be in equilibrium at point Q, that is, when he consumes C_0 in the present period and C_1 in the future period. He consumes more than his income in the present period by borrowing against the future income, and he consumes less than his income in the future period 1 and pays back the loan with interest of period 0 and of the savings of the period 1.

If consumption in any period is not considered by an individual to be an 'inferior' good, any increase or decrease in any period's income will lead respectively to an increase or decrease in the consumption of all periods.

An implication of the above analysis is that current consumption will vary less than the current income. The longer is the period, the smaller is this variation because -a given increase in income will be spread over larger and larger number of periods (years).

The relationship between the present value of the life-time income stream and the current consumption as symbolised in Fig. 7.4 above gives us the following general form of the consumption function which underlines both the life-cycle hypothesis of Modigliani, Ando and Brumberg and the permanent-income hypothesis of Friedman.

(15) $C_1 = f\,(PV_1); \quad f > 0$

where PV_1, the present value of current and future income (i.e. life-time income) at time t, is given by the following equation:

(16) $$PV_1 = \frac{Y_t}{(1-r)^t}$$

The above analysis explains the general features of the life-cycle theory. But real life is complicated with a. number of other factors. There might be, for example, uncertainty regarding the expected life-time. There may also be desire to leave bequests in which case an individual will not consume the whole life-time income. Another complication may come from the nature of the composition of the family: how may children will have to be provided for before they start earning for themselves. Apart from the above limitations, the model also assumes that individuals are able to guess their future flow of income correctly.

Moreover, it must be remembered that the above is only a micro model and we cannot derive a macromodel from it by mechanically adding together individual consumption functions. If population and gross national produce in an economy are not growing, saving and dissaving will equal and, therefore, there will be no net saving. But if the economy is growing and population is growing, the proportion of the young will exceed the proportion of the old in the total population. Consequently, there will be net saving. It follows, then, the aggregate consumption depends partly on the age-distribution of the population. It will also depend on the average age of retirement as well as presence or absence of social security arrangements in the society.

Self Check Exercise-4

Q1. Discuss Model with borrowing and lending.

7.8 The Wealth Effect on Consumption

The wealth effect on consumption refers to the effect of change in real wealth on consumption expenditure in an economy, all other things remaining the same. The real wealth in the hands of the people change due to the accumulation or accumulation of assets, prices remaining the same. But this real wealth can also change if assets and asset prices remaining the same, the general price level changes, or when asset prices are changing along with the general price level in the same direction but the former is changing at a different rate than the latter. In fact, change in real wealth is relate to change in purchasing power, the latter being determined by the former. In this sense, the wealth effect, which is generally associated with the names of Pigou and Haberler, is akin to Patinkin's real-balance effect also. Patinkin's real-balance effect refers to the effect on aggregate expenditure in the economy when the real vales of a given stock of money changes due to a change in the general price level. It is thus not without reason that the "wealth effect" in economics is also referred to as "Haberler-Pigou-Patinkin Effect".

The wealth effect may show itself not only in consumption expenditure but also on investment expenditure. But here we shall confine ourselves to this effect on consumption expenditure only.

It should be noted that the wealth effect is just like the income effect of the microeconomic theory of consumers' demand. This implies that, all other things remaining the same, when wealth increases, an individual tends to increase his consumption expenditure unless consumption is to him an "inferior" good which indeed is very rare. It may normally tend to increase both consumption and saving of an individual unless he regards either of them as an "inferior" good. This is specially so, if the wealth is in the form of income-yielding assets. Pigou, however, had also argued that people generally would save even at the zero rate of interest because one of the important motives of saving is to provide for future. Since the more is the wealth of an individual, the more he believes that his future is well provided for, therefore with every increase in his wealth, he will tend to spend a greater proportion of his income on consumption. In other words, his propensity to consume rise; with an increase in his wealth and it falls with a decrease in his wealth. In terms of the conventional Keynesian macro theory of consumption this implies that the Keynesian consumption function is shifted upwards due to an increase in the real wealth of the people, and it is shifted downwards, when the real wealth of the people decreases.

As shown in Fig. 7.5 below, C_0 is the initial consumption function. When the real wealth of the people increases, it will shift upwards to a position like C_1 in Fig. 7.5. On the other hand, if there is a decrease in the real wealth of the people, it will shift downwards to a position like C_2 in Fig. 7.5. The greater height of C_1 function indicates that any given level of income, the proportion of income spent on consumption would be greater than on the C_0 function. On the other hand, the lower height of C_2 compared to C_0 indicates that any given level of income, a smaller proportion of income would be spent on consumption. Thus, the wealth effect causes a rise or a fall in the propensity to consume of the people and by so doing it helps in increasing or decreasing the aggregate consumption expenditure in an economy, depending on whether the real wealth in the possession of the people increases of decreases.

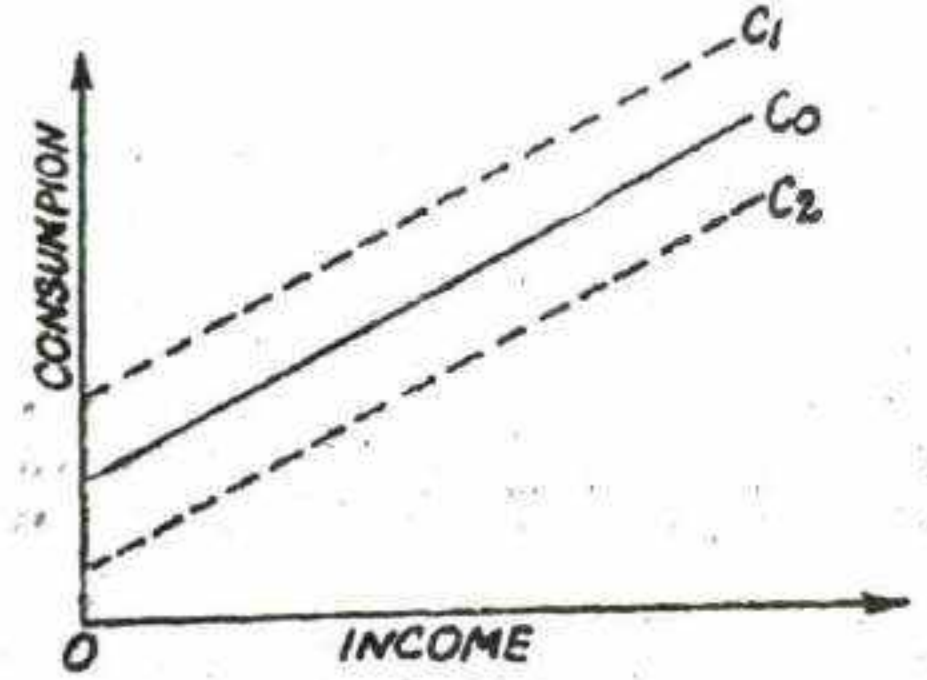


Fig. 7.5

The Permanent-Income Theory of Friedman and the Life-Cycle theory of Modigliani, Ando and Brumberg have a direct reference to real wealth as an important determinant of consumption. The estimation of permanent income to which consumption expenditure is related in Friedman's theory takes account of real wealth also. As regards the life-cycle theory, we have already seen how it includes real wealth as an explicit determining variable of consumption function:

$C = aW_R + cY_L$

We may further elaborate this relationship between consumption and real wealth.

If we divide the above life-cycle consumption by Y_D that is, disposable income, we get

(17) $\frac{C}{Y_D} = a\frac{W_R}{Y_D} + c\frac{Y_L}{Y_D}$

WR The equation (17) above 'implies that if $\frac{W_R}{Y_D}$ and $\frac{Y_L}{Y_D}$ ratios are constant, then $\frac{C}{Y_D}$ ratio will also be constant, that is, the propensity to consume disposable income (Y_D) will be constant. But, $\frac{W_R}{Y_D}$ if is changing, that is, if real wealth (W_R) changes, all other things remaining the same, then the average propensity to consume disposable income $\left(\frac{C}{Y_D}\right)$ will also change.

The above result explains the so-called Kuznets' Puzzle also. This Kuznets' Puzzle is nothing but the in- consistency between the short-run consumption function which has a Keynesian form making a positive intercept on the vertical axis and the long-run consumption function which is a straight line passing through the origin and thus shows a constant average propensity to consume. In the short run, the ratio $\frac{W_R}{Y_D}$ generally falls, because while Y_D rises W_R remains more or less constant. However, as disposable income increases over a longer period, savings accumulate and get transformed into assets and consequently W_R also rises so as to restore the $\frac{W_R}{Y_D}$ ratio.

Self Check Exercise-5

Q1. What do you know about wealth effect on consumption?

7.9 Summary

Ando and Modigliani have Formulated a consumption function which is known as the Life cycle Hypothesis. According to this theory, consumption is a function of life line expected income of the consumer. The consumption of the individual consumer depends on the resources available with, the rate of return on capital, the spending plan and the age at which the plan is made. The present-value of his income includes income from assets or property and from current and expected labour income.

7.10 Glossary

The Life cycle hypothesis is not free from certain limitations. First, the contention of Ando and Modigliani and a consumer plans his consumption over his life line is unrealistic because a consumer concentrates more on the present rather than on the future which is uncertain. Second, the life cycle hypothesis pre-supposes that consumption is directly related to the assets of an individual. As assets increase his consumption increases and vice versa. This is also un warranted because an individual may reduce his consumption to have Larger assets. Third, consumption depends upon one's attitude towards life. Given the some income and assets, one person may consume more than the other.

7.11 Answer to self check exercises

Self Check exercise -1

Ans.1. Refer to Section 7.3

Self Check exercise -2

Ans.1. Refer to Section 7.4

Self Check exercise -3

Ans.1. Refer to Section 7.5

Self Check exercise -4

Ans.1. Refer to Section 7.7

Self Check exercise -5

Ans.1. Refer to Section 7.8

7.12 Suggested Readings

1. R. Dornbush and S. Fischer, Macroeconomics Ch. 8. pp. 265 ff.
2. W.H. Eranson, Macroeconomic Theory and Policy, Ch.10
3. A. Ando and F. Modigliani, "The 'Life Cycle' Hypothesis of Saving : Aggregate Implication and Test" American Economic Review, March, 1963.
4. F. Modigliani and R.E Brumberg. "Utility Analysis and the Consumption Function", in K.K. Kurihara (ed.). Post-Keynesian Economics

7.13 Questions for Self-study only

1. How will you distinguish the Life-cycle theories of consumption from the other theories of consumption?
2. Explain the Life-cycle Hypothesis of consumption expenditure. How does it differ from the Permanent Income Hypothesis?
3. Explain the wealth effect on consumption behaviour according to the Life Cycle theory.

*****

Unit - 8

THEORY OF INVESTMENT DEMAND
(1) THE KEYNESIAN APPROACH

STRUCTURE

8.1 Introduction

We know that the aggregate demand in a modern economy is comprised of three sectoral demands, namely, the aggregate consumption demand, the aggregate investment demand and the aggregate public or government expenditure demand. Of these three sectoral demands the last one is believed to be broadly determined by political considerations. In economic jargon this implies that the competent of the aggregate demand arising in the government sector is autonomous and is Determined exogenously. Of the other two components the consumption demand has been already analysed and explained in the preceding two lessons. Now we shall analyse and explain the behaviour of the remaining sectoral demand, namely, the investment demand. For that, it will be useful for us to familiarise ourselves with some basic concepts of the theory of investment.

8.2 Learning Objectives

After going through this Chapter you will be able:

- To understand the basic Concepts of Investment
- To know what is autonomous Investment
- To know what is Induced Investment
- To understand Keynesian Theory of Investment

8.3 Basic concepts of the Theory of Investment

In the first place we should know the meanings of the term, investment, as this term is 'employed to convey more than one meaning. For example, the term may imply both financial investment, and real investment. When a person purchases some stock of an already existing company, it is simply a financial investment, specially when this stock is purchased from some individual or institution already holding that stock. In this particular case, such an set by an individual or a number of 'individuals will not lead to any increase in investment in even financial sense from the point of view of the economy as a whole because the financial investment of the purchasers if such stock of company shares is exactly matched with financial disinvestment of an equal amount by the sellers of this stock.

However, in macro-economics, this term is generally, used in the sense of real investment. Real investment is defined as addition made to the capital stock of an economy. Any financial investment which does not end up in increase in the capital stock or the production capacity of an economy is not regarded as real investment. This sort of investment does not lead to an increase in the stock of capital goods of the economy. So when we use the term, investment, in the theory of investment and income determination, it is not used in the sense of a mere financial investment; it rather refers to expenditure on newly created capital goods, on the purchase of new machines and new factory buildings. It is only when such capital goods are newly created that they create additional employment and income. Hence investment is interpreted as the addition made to the capital stock of an economy, and the expenditure made on the creation of this additional stock of capital is the money measure of this real investment.

The total expenditure made on the newly created capital goods of all kinds is the money measure of gross investment. A part of it only replaces the machines and other capital equipment which wear out during the process of production (which is called depreciation) or become obsolete due to technical progress (which is called obsolescence). This part of the gross investment is termed as replacement investment; it is the investment necessary to keep the capital stock intact. An amount of capital goods produced over and above the replacement needs is net addition to the capital stock of the economy. This net addition to the capital stock is referred to as net investment. Thus, Gross Investment = Replacement Investment + Net Investment

It is, then, obvious that if the new total investment, that is the gross investment, equals just replacement in- vestment there is zero net investment. If the former falls short of the latter i.e. gross investment is less than the Replacement investment, net investment is negative.

It should be noted that investment, as defined above, is a change in the capital stock, which may be positive, zero or negative. Since it refers to change, in vestment is a flow concept and, therefore, is measured per unit of time.

Self Check Exercise-1

Q1. What are the basic concepts of the theory of Investment?

8.4 AUTONOMOUS INVESTMENT

From the analytical point of view still another distinction is between autonomous investment, and induced investment. In income analysis an investment is said to be autonomous, if its amount does not depend on the level of output or income but is determined by factors other than the level of output, such as the rate of interest, technology or political considerations. So, if investment is autonomous, it remains constant, if output alone changes, and the investment function will be horizontal like I_1I_1 or L_2L_2 in Fig. 8.1. Supposing the investment function is initially in the position I_1I_1 its amount will remain I_1 whatever may happen to output, provided the parameters of the function, such as the rate of interest, technology, political and other factors influencing investment, and profit expectations, remain the same. However, if there is a change in the parameters, the autonomous investment function will shift. A fall in the rate of interest or an improvement improbity expectations will shift it upwards to take a position like I_2I_2. A rise in the rate of interest or a worsening of the profit outlook will shift it downwards.

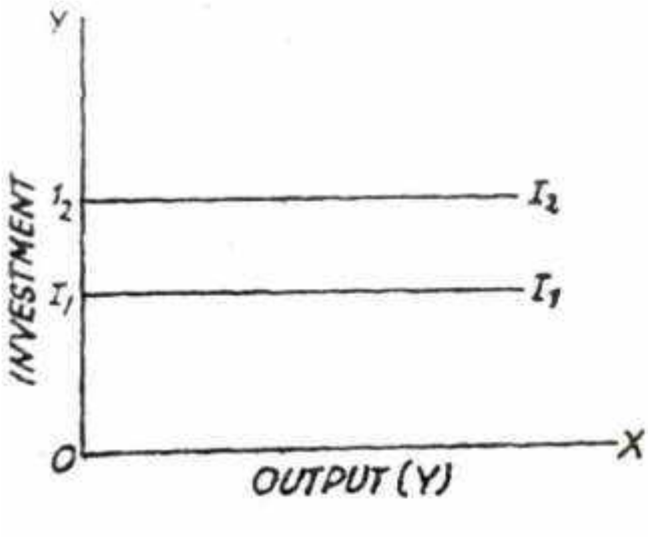


Fig. 8.1

The above concept of autonomous investment in particularly relevant to a planned economy or a war economy when public investment is employed as a means of influencing employment and income. We can conceptually think of autonomous investment in a free enterprise free from wartime controls, although, in fact, investment in such an economy may depend, among other factors, on the level of output too. Any investment in such an economy, which is caused by a factor other than a change in output, will be described as autonomous and it shifts the investment function as shown in Fig. 8.2

As a matter of fact, investment is influenced by the level of output or income. Increase in income raises the level of consumption expenditure which results in a rise in the demand for consumer goods. It may raise the profitability of investment and may thus induce investment that depends on the level of income is referred to as induced investment. It is assumed that higher levels of income are associated with higher levels of induced investment so that the induced investment function, I_1 (Y), is positively sloped as shown in Fig. 8.2

Self Check Exercise-2

Q1. What do you know about autonomous investment?

8.5 INDUCED INVESTMENT

The induced investment function I, (Y) in Fig. 8.2 cuts the income axis, OX, to the right of the origin, indicating that there is some positive minimum level of income at which indaged investment is zero. In terms of our Fig. 8.2 it happens at A with income level at OA. If incomes falls below it net investment, (assuming there is only induced investment) may even be negative. When the income level is dismally low and the entrepreneurs become apprehensive about prospective sales, they may sell out of inventories, on the one hand, and may neglect the replacement of the worn out and obsolete capital equipment, on the other. This makes the net investment negative. However, it is to be noted that the negative net investment cannot exceed the replacement investment for the economy as a whole.

The induced investment function will shift, if there is a change in some parameter of the I (Y) function. As already stated, all factors, other than income, which influence investment are described as the parameters of the I (Y) function. Rate of interest is such a parameter. If it falls, the I (Y) function will shift upwards as 1_1 (Y) does in Fig. 8.2, when it moves upto the position I_2 (Y). If we make the simplifying assumption that the marginal propensity to invest (MPI) is uniform at all levels of income, the I (Y) function will shift in a parallel manner as is the case in our Fig. 8.2. Then, it is possible to distinguish between induced investment and autonomous investment. The vertical distance between the original I_1 (Y) function and the shifted I_2 (Y) function gives us the autonomous investment. In Fig. 8.2 it equals AB.

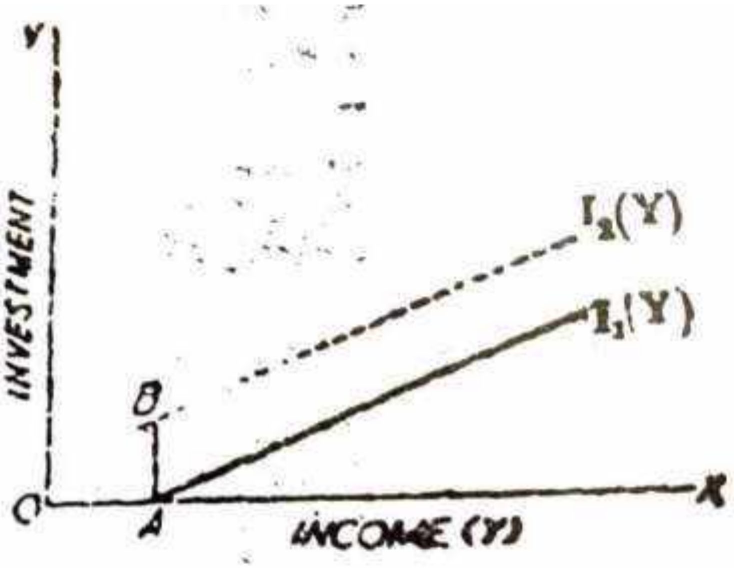


Fig. 8.2

But the assumption of a uniform MPI is only a simplifying assumption; it is not an empirical assumption rooted in the observed investment behaviour. There are strong a priori reasons to believe that at levels of income pretty short of full-employment level, the in- crease in induced investment might be little or even zero in response to a change in income, for a lot of 'idle capacity' is available. Therefore, at such low levels of income MPI will be too low. But, as the income approaches the full-employment level, idle capacity" is no longer available and capital stock must be increased to meet the increasing demand for consumption goods. at sufficiently high levels of income, MPI must be rather quite high. This suggests that the induced investment function I (Y) is likely to be non-linear rather than linear.

The induced investment, mentioned above, has been interpreted rather in static terms. We can also have a dynamic concept of it. Induced investment becomes dynamic in concept, if it is made to depend on the change in the level of income in such a manner that investment in the current period (L_1) is a function of the change in the level of income in the previous period (ΔY_{t-1}). where $Y_{t-1}=Y_{t-2}$ The dynamic induced investment function, thus is: $I_1= f(\Delta Y_{t-1})$. If the MPI $\left(\frac{\Delta I}{\Delta T}\right)$ is β the dynamic I (Y) function may be expressed as $I_1 = \beta \, \Delta \, Y_{t-1}$.

Having grasped the important basic concepts of the theory of investment, we may now come to the examination of some more important hypotheses seeking to explain the investment behaviour. Since Keynes's theory is the starting point of all modern macro-economic theory, we can do no better than starting with Keynes's own theory of investment.

Self Check Exercise-3

Q1. What is Induced investment?

8.6 Keynes's Theory of Investment

As Kurihara has rightly pointed out, there are three different approaches followed by Keynes in his treatment of the investment behaviour. In his simple theory of cutput for the economy as a whole, he looked upon investment as an independent variable, assuming that investment opportunities are historically given. He seemed to argue that investment decisions in a private-enterprise economy are the resultant of so many complex influences that investment may be taken initially as a given constant. But in his more elaborate marginal-efficiency-of-capital theory, he made investment a variable functionally dependent on the independent profit and interest variables. And, in his statements pertaining to the secular period, Keynes made investment a function of yet another variable, namely, capital accumulation or the capital stock.

However, it is his marginal-efficiency-of-capital explanation which occupies the pride of place in Keynes's theory of investment and it is this explanation which is generally identified with Keynes's theory of investment as such. Therefore, we shall start with the marginal-efficiency-of-capital explanation of investment behaviour.

Marginal Efficiency Of Capital (MEC) Theory of Investment of Keynes is substantially the old classical theory which explains investment behaviour with reference to productivity of capital and the rate of interest. What Keynes has done is to refine and elaborate upon some of the concepts of this theory and to change the emphasis.

The essential idea underlying MEC theory is that investment expenditure in a free enterprise economy is determined by two factors, one of which is the marginal efficiency of capital and the other one is the rate of interest.

Marginal Efficiency of Capital (MEC) is a more refined and ornate version of the old concept of marginal productivity of capital. MEC theory as well as the old marginal productivity theory has been derived from the assumption of the profit maximising behaviour of entrepreneurs undertaking investment MEC, like the marginal productivity of capital, is a measure of the yield from the contemplated increment in investment, which must be compared with the rate of interest to assests the profitability of the contemplated increment in investment.

The term, 'capital', in the MEC theory refers to real capital and not to money or finance capital. cal capital is divided into fixed capital and working capital. While fixed capital is in the form of fixed plant and other durable equipment, working capital is in the form of inventories and raw Keynes's MEC theory emphasises the importance of fixed capital. There are precisely two basic reasons for it. Firstly, in a modern economy, investment in the form of fixed capital makes up the bulk of the total investment. Working capital in the form of inventories and raw materials is quantitatively not significant. Secondly, the dynamic role played by expectations in determining MEC arises form the existence of durable equipment which, as Keynes observed, links the economic future to the present.

The fact about fixed capital or durable equipment, by virtue of which "the economic future is linked to the present," is that the return from durable equipment consists of flow of income spread over the whole life of that equipment. This fact is vitally connected with the estimating of MEC.

What is this MEC? Keynes had defined MEC as "that rate of discount which would make the present value of the series of annuities given by the returns expected from the capital asset during its life just equal to its supply price." The capital asset referred to in the above quotation is an additional unit of a given type of durable equipment, the construction of purchase of which is under consideration. It follows from the above definition of MEC that it can be discovered only by comparing the present value of expected yield from the additional unit of a given capital asset over its whole life period with its supply price. Suppose that the economic life of a given capital asset is n years and it is expected to yield a net income of $R_1R_2R_2$ ....R_n in the years 1,2,3.................respectively. By 'net income' is meant the expected gross yield of the given capital asset minus the costs of the co-operating factors as well as the running costs. The rate of discount which will make the present value of the series of annuities equal to the supply price of the asset can be discovered as follows :

$$s = \frac{R_1}{(1+e)} + \frac{R_2}{(1+e)^2} + \frac{R_3}{(1+e)^3} + \ldots\ldots + \frac{R_n}{(1+e)^n}$$

where S is the supply price of the asset: R_1R_2 R_3...............R_3 as stated above, are the series of annuities, and e is the required rate of discount or the marginal efficiency of the given asset.

The marginal efficiency of a capital asset so discovered is a percent per annum rate which can be directly compared with the rate of interest which too is a percent per annum rate. If the MEC is greater than the current rate of interest, it is profitable to make the investment on the asset; otherwise not.

However, at any given time there is a number of different types of capital assets on which investment can be considered. We can calculate marginal efficiency of each type of capital assets in the manner explained above. The highest of these individual MEC's is described as the MEC is general: it is the marginal efficiency of that particular type of capital asset which is the most worthwhile for the community to produce.

Having seen what MEC means, let us now enquire into its behaviour. How is it likely to behave as investment is increased? The formula, given above, to calculate MEC suggests that what happens to MEC (e) in response to an increase in investment depends on how the increase in investment changes the supply price (S) of capital assets on the one hand, and the expected yield from the capital assets (R), on the other. It is reasonable to assume that, as the stock of capital goods increases the economy becomes better equipped to meet the demand for final goods. This tends to bring down the expected yield from additional capital asset. On the other hand, the supply prices of capital assets are expected to rise, as their production increases to meet the increasing demand for them. This results from the operation of the diminishing returns. Both of these factors, rise in the supply prices of capital assets and fall in the expected yields from them, depress the MEC. Hence, Keynes postulated that the MEC schedule linking investment and MEC is negatively sloped as shown in Fig. 8.3.

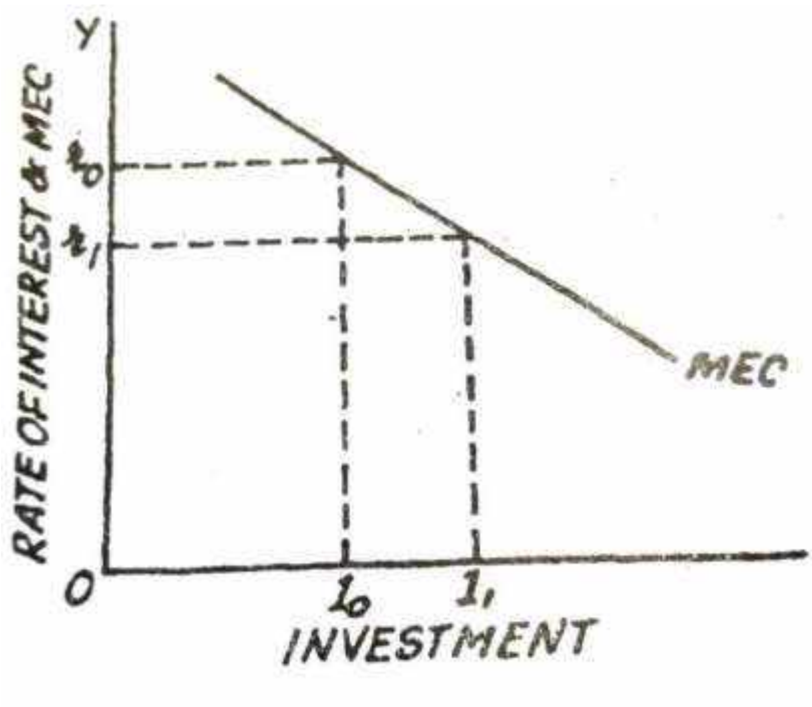


Fig. 8.3

According to Keynes, the rate of interest is determined independently of the MEC. As we shall see later on in detail and as we have already pointed out in the lesson on the Keynesian Model, the rate of interest is determined by the demand for money and the supply of money. Thus the rate of interest is an independent variable. If the rate of interest, which is independent of MEC, is r_0. the investment expenditure will be I_0. If it falls to r_2 the investment expenditure will increase to I_1.

We may here pause to note the similarity and contrast between Keynes' MEC theory and the classical theory. Similarity is to be found in the final result of two theories, both of which suggest the investment to be inversely correlated with the rate of interest. However, the MEC theory provides us with a more elaborate and refined explanation of the negatively sloped I (r) function. The classical theory suggested that a larger amount of investment in capital goods diminishes the marginal productivity of capital and, therefore, unless the rate of interest came down to equal the lower MP of capital, the larger investment expenditure would not be undertaken. But Keynes's MEC theory links the negative slope of I (r) function not to the crude concept of diminishing marginal productivity of capital but to the much more refined concept of MEC, which takes note of changes in the expected yields over the whole life period of a capital asset as well as in its supply price. Secondly, while the rate of interest in the classical theory depends on investment as well as on savings in the Keynesian theory the rate of interest is independent of investment and, therefore, of MEC too. But, in the classical theory it is dependent on MP of capital. However, from the point of view of final result too, there is a basic difference between the two theories, and although this difference can be described as a difference of emphasis, yet the difference is crucial as regards the policy implication of the two theories, Keynes held that although the I (r) function was negatively sloped due to the diminishing MEC schedule, yet the interest elasticity of the investment function was very low. The classical held the opposite view, namely, that the interest-elasticity of the investment function was sufficiently high. If the investment function is interest-inelastic, as suggested by Keynes equality between full-employment level of savings and investment may not come about through a practicable change in the rate of interest, so that a full-employment policy would have to depend on some policy instrument other than interest-rate policy.

Self Check Exercise-4

Q1. Discuss Keynes theory of Investment

8.7 Interest Elasticity of Investment Function.

referred to above measures the degree of responsiveness of investment expenditure to a small change in the rate of interest, and it can be expressed as $\frac{dI}{dr} \cdot \frac{r}{I}$. In terms of the shape of the 1 (r) function, it can be said that the steeper is the I (r) function, the less interest-elastic it is.

Before the thirties of the present century and, particularly, before the public ton of Keynes's General Theory, investment function was believed to be rather interest-elastic. But during the depression of the thirties this classical hypothesis of interest-elastic investment function came under doubt, and Keynes's analysis reinforced this doubt. The current belief, common among many economists, is that in modern advanced economies investment is interest-inelastic, though the evidence is not quite conclusive.

One plausible apriori reason that can be given to support the hypothesis of interest-inelastic investment function is that the rate of interest as a cost factor is unimportant, if the capital asset is expected to pay for itself in a short period, say in a period of less than five years. But, where the period in which a capital asset is expected to pay for itself is long, as is the case with public utilities, construction industries and other such industries with long gestation period, the rate of interest as an element in costs becomes quite important. Therefore, on apriori's considerations investment in such projects would be interest-elastic. Whether the investment function for the economy as a whole is interest- elastic or interest-inelastic will depend on the structure of investment, that is, whether the bulk of aggregate investment in the economy is in the form of projects of long gestation periods or short gestation periods. On this argument no apriori conclusion can be arrived! at Therefore, it is but proper to state that the interest-elasticity-or interest-inelasticity of the investment function is a matter of empirical observation.

Another plausible reason which is generally offered in support of the hypothesis that investment function is interest-inelastic is that in modem advanced economies, a typical firm depends not on external sources but on internal sources to finance its investment. It is argued that the demand for investment goods may be unresponsive to changes in the rate of interest, if the firms make use of their own accumulated reserves or surpluses to finance their investments. It is suggested that the firms using their reserves to finance investments do not, in practice, charge imputed interest costs to the total costs. But this suggestion is at variance with the rational profit-maximising behvaiour of firms. There- fore, some would argue that firms which have internal resources to finance their investments would, to some extent at least, charge themselves the imputed interest costs at a rate commensurate with what can be earned by them by investing their funds in securities. To the extent it is true, the usual explanation for interest-ellastic in-vestment function lacks conclusiveness.

Some empirical studies of this problems have been made by a number of economists. Such studies were conducted by a group of Oxford University economists in 1938, by Harvard Business School also in 1938, by Ruth Mack for NEER in 1941 and by Minnesota Business School in 1950. These investigations are believed to point to the interest-inelasticity of investment function. But William H. White, in his article, "Interest-Inelasticity of Investment Demand" (AER, 1956), has reexamined these surveys and has cast doubts on the conclusion of their findings. He has particularly pointed out the bias in these surveys arising from giving equal weights to small businesses, which predominantly to self-financing, as distinguished from large businesses, who resort to outside finance and are, therefore, influenced by interest rates in their investment expenditures. He argues that even though in number small firms may be predominant yet in total investment it is the share of large firms which is predominant. Therefore, giving equal weights to both types of firms has vitiated the result arrived at in the above mentioned empirical studjes. Another vitiating factor is that some of these surveys pertain to the Depression period when entrepreneurs were abnormally conservative, and when reductions in interest rates failed to revive their optimism. In view of these and other defects noted by White in these surveys, he concludes that no definite conclusion can be drawn from these empirical studies. In his opinion, the surveys do indicate that investment is to some degree less elastic with respect to interest rate than thought by the proponents of interest-rate policy. But they do no establish that interest-elasticity of investment falls seriously below what its proponents claimed.

A change in investment expenditure can come about in two ways, either through a change in the rate of interest or through a shift in the MEC function which, in turn, shift the investment function itself. Supposing MEC, in Fig. 8.4 to be the initial MEC_0 function and r_0 as the initial rate of interest, investment would be I_0 Now, if the rate of interest falls to r_1, the investment would increase to I_1. On the other hand, the rate of interest may remain the same at r_0, but the MEC function may shift to the right to take the position MEC_1. In this case too the investment would increase to I_1. despite there being no change in the rate of interest. We have seen that Keynes and his followers were believe that the investment function is rather interest inelastic, so that a very large fall in the rate of interest would be necessary to bring about a relatively small increase in investment. Therefore, the Xeynesians believe that the shifts of the. MEC schedule are much more important than movement along given MBC schedule. A shift of MBC schedule causes a shift of the investment function in the same direction. Therefore, in so far as increase in investment is crucial to being about full employment, reliance has to be put more on the shifts, to the right, of MEC schedule than on reductions of the rate of interest.

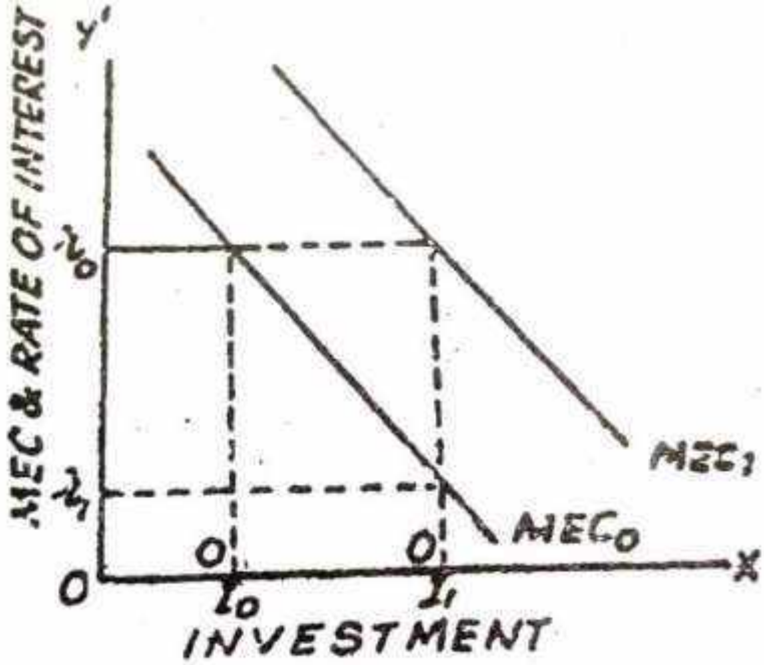


Fig. 8.4

The point made above suggests for us another problems, namely, what are the factors which determine the position and cause shifts of the MBC schedule on which the investment function depends? We shall examine this problem in the next lesson.

Self Check Exercise-5

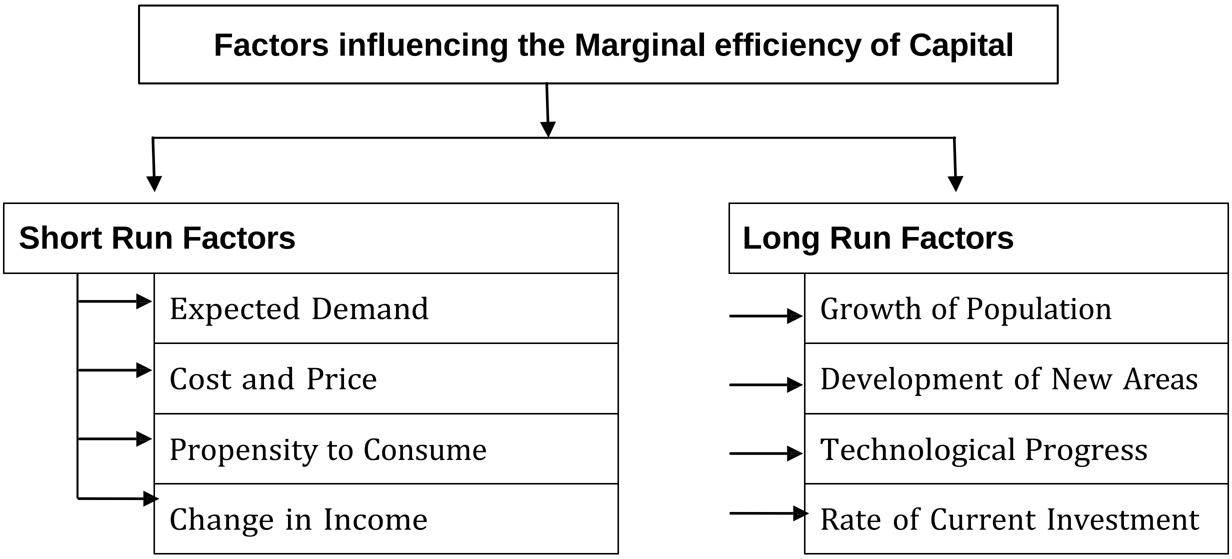
Q1. What is Interest Elasticity of Investment Function

8.8 Summary

Investment means the expenditure incurred on capital goods, such as machines, buildings, equipments etc. But such a conception of Investment refers to the gross Investment. Some expenditure is made to offset the depreciation in the existing productive capacity. This is denoted as replacement investment or capital consumption. The excess of gross Investment over the replacement Investment is the net Investment, which signifies the purchase of new capital assets. It results into addition to the existing stock of capital assets. The addition to the stock physical capital, i.e. net Investment raises the level of aggregate demand bringing about changes in income, out-put and employment. Keynes and Many other economists consider the increase in the inventories of consumer goods in the category of the capital and therefore it is included in investment.

8.9 Glossary

There are large number of factors both short run as we as long run which influence the Marginal efficiency of capital in a private enterprise economy.



8.10 Terminal Questions

Self Check exercise -1

Ans.1. Refer to Section 8.3

Self Check exercise -2

Ans.1. Refer to Section 8.4

Self Check exercise -3

Ans.1. Refer to Section 8.5

Self Check exercise -4

Ans.1. Refer to Section 8.6

Self Check exercise -5

Ans.1. Refer to Section 8.7

8.11 References/ SUGGESTED READINGS.

1. J.M. Keynes General : Theory Ch. XI. XII.
2. Dudley Dillard : The Economic of J.M Keynes Ch. VII
3. E. Shapiro : Macroeconomic Analysis Ch. XI
4. Dembers and Macdougall : Macroeconomics Ch. VII.
5. Mueller : Readings in Macroeconomics Reading No. 8 by White.
6. W.H. Branson : Macro-economic Theory and Policy, Ch. 11.

8.12 Terminal Questions

Q.1 Explain the determination of Investment demand according to Keynesian theory.

Q.2 Diagrammatically explain Interest Elasticity of Investment Function.

****

Unit - 9

THEORY OF INVESTMENT DEMAND (2): KEYNESIAN AND POST-KEYNESIAN APPROACHES

STRUCTURE

9.2 Learning Objectives

After going through this chapter you will be able to know following relationships.

- To know Business Expectations and Investment
- To know Technology and Investment
- To know the level of Income and Investment
- To understand the Accelerator theory of Investment.

9.1 INTRODUCTION

We considered, in the last lesson, Keynes's MEC theory of investment, according to which the rate of in- vestment is, in essence, determined by the MEC in con- junction with the rate of interest. But the rate of interest is determined exogenously in the money market and is, moreover, sticky. It is, therefore, MEC which is the strategic determinant of the rate of investment as well as the fluctuations in it. The very high degree of instability of the investment function, that is, the sudden and violent shifts in the I (r) function spring from the instability of the MEC schedule that lies behind the I (r) function. But, why is the MEC schedule unstable? As it was explained in the last lesson, MEC is governed by two factors, the supply price of capital and the prospective yield of capital. It is the latter factor which is the basic cause of the instability of MEC schedule and, therefore, of the I (r) function too.

9.2 Learning Objectives

After going through this chapter you will be able to know following relationships.

- To know Business Expectations and Investment
- To know Technology and Investment
- To know the level of Income and Investment
- To understand the Accelerator theory of Investment.

9.3 Business Expectations and Investment

The most important characteristic of perspective yield is that it is only an expected return. The realised return may well turn out to be better or worse than the expected. But it is the expectations of yield, rather than the actual yield, which govern the investment decisions of the entrepreneurs. It is thus that expectations become important in determining the position of the MEC and I (r) function. Any change in entrepreneurs expectations with regard to the yield from capital assets will shut the MEC and I (r) function up or down.

Keynes classified expectations into short-term and long term expectations. The short term expectations pertain to the net revenue from the sale of output produced with the existing plant. But the long-term expectations pertain to the net revenue expected from the sale of out-put produced with variation in the size of the existing plant or with an entirely new plant. It is the long term expectations which are vital to the MEC schedule and the I (r) function which account for their instability.

Short term expectations are rather stable, because the realised results of the recent past are a relatively safe guide to what can be expected in the near future. In a short period most of the circumstances influencing out-put and revenue remain substantially the same from day to day or from week to week or from month to month. By their very nature, short-term expectations are subject to frequent check in the light of realised results, Realised results are thus, a satisfactory guide to the near future, and, therefore, can be substituted for expectations relating to near future. Short-term expectations are thus stable and less important.

But the long-term expectations are highly unstable and, therefore, are more important in explaining the fluctuations or shifts in the MEC and I (r) functions. While the economic activity can be safely expected to remain the same over a short period, it cannot be expected to be so over a long period. Realised result of, say, past five years cannot be a safe guide for estimating yields from capital assets in the next five years. It is not possible in the case of durable equipment to check expectations against realised results at short intervals as can be done in the case of short-term expectations. This renders the long-term expectations, which are the only relevant expectations in determining MEC, highly unstable.

Let us look more closely at the various elements which enter into the formulation of the entrepreneur's long-term expectations. One important element among these is the existing stock of capital assets. If investment, for example, in a given type of textile machine is being contemplated, the expected return or prospective yield from it depends, in part, on the number of such machines already in existence. The greater is this number the lower will be the prospective yield from this type of capital asset. The existing stock of a capital asset can be ascertained with more or less, certainty. There- fore this is a factor which cannot cause the instability of MEC and investment, I (r), schedules. That is why Keynes had acknowledged that there are some considerations affecting long-term expectations which do not rest upon the "shifting sands of a precarious future."

However, as soon as we go beyond the existing stock of capital and its capacity to satisfy the existing demand, we enter into the area of uncertainty. An entrepreneur contemplating in a given type of capital equipment of the durable type has to estimate the probable economic life of it, which depends not only on the rate at which it physically wears out but also on obsolescence, the rate of which depends on the frequency with which technological improvements and innovations are introduced. He has also to make some guess with regard to the general level of effective demand over the whole period of the expected economic life of the given capital equipment. In order to guass the level of this demand, he has to take into consideration a number of other factors such as the probable degree of new competition, which might influence the price of the product to be produced with the contemplated investment, from year to year, the size of the export market, changes in the monetary and fiscal policies of the government, conditions in the labour market including the level of wages and the frequency of strikes, future trends of other factors prices, political climate, wars, revolution, etc. These are factors which cannot be accurately fore known, because they have no probability calculus. The long-term expectations are, therefore, subject to sudden revisions and are highly unstable. Periods of optimistic expectations including almost a feverish investment activity tend to be followed by periods of pessimistic expectations dragging economic activity to the minimum. Optimistic expectations tend to shift up- ward the MES as well as the I (r) function, and pessimistic expectations shift them downward.

The alternating waves of optimism and passimism in business would arise from the fact that there being no reliable basis for a scientific formulation of long-term expectations, they tend to be influenced to a disproportionate degree by the ascertainable facts of the current situation. But, as already explained, the facts of current period cannot be a substitute for long-term expectations which depend on a large number of uncertain factors. Consequently, the investors in durable capital are favourably surprised or disappointed as the future unrolls itself. The entrepreneurs tend to be optimistic when they are favourably surprised, and they tend to be pessimistic when they are disappointed. The MEC and I() functions are shifted upward in the former case, and they are shifted downward in the latter case.

According to Keynes, check exchange activity in a modern free enterprise economy is another destablishing factor as regards the MEC and I (r) functions. In modern business organisation ownership is separated from control. Secondly there is the organisation of stock exchanges where stocks can be easily sold and purchased whenever one likes to Since majority of the investors in new stocks (which are intended to collect savings for investment in new stock of real capital) do not have the means and ability of forecasting the events influencing the prospective yields of the various types of capital assets, they tend to be guided by the prices of the similar old stock at the stock exchange prices are generally controlled not by the economic and other factors affecting the prospective yields, but by the operations of the speculators, who are simply trying to successfully forecast the mass psychology of the operators at the stock exchanges. What has happened is that the institution of stock exchange has greatly increased the liquidity of an individual investor, in consequence of which, combined with the too precarious a knowledge of the future events affecting MEC, he allow himself to be guided by the speculators' activity, for the high liquidity made possible by the organisation of stock exchanges permits him to convert his stock into cash at a short notice. Thus, 'speculation' tends to dominate 'enterprise' in the mar- ket and it, consequently, makes the MEC and the I (r) functions highly unstable. Not only that, this domination of 'Speculations over enterprise is in the opinion of Keynes, an ill basis for the capitalist development of a country. In his words. "Speculaton may do no harm as bubbles on a steady stream of enterprise but the position is serious when enterprise becomes the bubble on a whirlpool of speculation. When the capital development of a country becomes a by-product of the activities of a casino, the job is likely to be ill done. (if General Theory, 1936, p. 139).

The above analysis gives a rather too much importance to expectations in determining the MEC and investment. It has been suggested recently that changes in long-term expectations have not been as important a determinant of change, in investment after World War II as they were before this war. One of the reasons is teat the Keynesian analysis, which assigns a very big role to expectations in explaining fluctuations in investment was based upon the assumption of a large number of freely competing entrepreneurs, each of them operating relatively small scale. Under such conditions there is lack of co-ordination and no individual entrepreneur knows what the others are doing in order to meet a given increase in demand. Therefore, there is a tendency for each one of them to increase his investment proportionately more than what is justified by the objective conditions. But, it is argued, in the present period, the bulk of investment expenditure in the advanced economies like that of the U.S.A is controlled by a few big enterprises. Huge errors of over-expansion or over-contraction, resulting from the waves of optimism and pessimism are less likely to occur in industries controlled by a few big corporations. In an industry dominated by a few big firms, it is likely that each firm will have carved out a secure position in the market and will, therefore, plan its expenditures on investment in plant and equipment in accordance with the estimated long-run growth potential of the industry, which is largely uninfluenced by the recurrent waves of optimistic and pessimistic expectations. Another reason for the reduced importance of long-term expectations may be looked for in the fact that there has not been any serious downturn of the economy in the postwar world.

Moreover marginal efficiency of capital and rate of interest are not the only factors which influence the in- vestment expenditure. There are also some other factors which determine the investment expenditure. The more important among these factors are : (i) technological change and innovation, (ii) level of income and output, (iii) changes in the level of income and output, and (v) level of profits.

Self Check Exercise-1

Q1. Write a note on business ecpectations and Investment.

9.4 Technology and investment :

Change in technology normally shifts the investment schedule through its effect on MEC schedule. A technological change, as usually interpreted, is a change in the method of production such that the production function is shifted. When such a change is identified as technological progress, it has the effect of raising the function and lowering the cost function: it now permits a larger output with the same amount of inputs, or the same output with a smaller amount of inputs. A technological change (or invention as it is sometimes described) may come about in any one of three possible forms. It may be of (i) the capital-using and labour-saving type, that is, it may require proportionately more of capital and less of labour to produce the same output; or (ii) the capital-saving and labour-using type, that is, it may require proportionately more of labour and less of capital to produce the same output; or (iii) neutral, that is, it may require less of both capital and labour to produce the same output, such that capital-labour ratio remains the same.

If the level of output remains constant, the capital- using and labour-saving technical change will shift the MEC schedule upward, because, to produce the same output, it now requires more of capital. The capital-saying technical change, whether it is as the same time a labour-saving one or not, will shift the MEC schedule downward. All other things remaining the same, investment would be greater in the former case and smaller in the latter.

The above relationship between the character of technological change and investment is of a simple and static type, for it is based on the static assumption that the level of output does not change. What is the dynamic relationship between the type of technological change and investment? We have to relax the assumption of unchanging level of output to find out this dynamic relationship. However, once we relax this assumption, the relationship becomes very complex one. We can here present only a general view of this relationship. If the output over years grows more rapidly than the labour input, but less rapidly than the capital input, we may presume that the technological change over the years has been of the capital-using and labour-saving type. Such a change in technology is likely to shift MEC schedule upward and no increase investment expenditure. However, if output over years increased more rapidly than the capital input but less rapidly than the labour input, the technological change may be presumed to be of a capital-saving type, which would tend to shift the MEC schedule downward and thus to decrease investment expenditure.

How the changes in technology and innovations have been shifting upward the MEC schedule is evident from the economic history of the West. In the middle of the nineteenth century the invention of railroads pushed up the MEC schedule in the countries of the West and thus provided an impetus to investment there. At almost the same time there was introduced the production of steel which was an important innovation not only in it- self but also because it facilitated a number of other innovations. At the beginning of the twentieth century there was a new momentous innovation in the form of the automobile industry which provided impetus to the development of modern highways, the petroleum industry, the rubber industry and the glass industry. Another momentous innovation of the current century, which came close on the heels of the automobile industry, was electricity.

All such innovations have the effect of lifting up- ward the MEC schedule and thus to increase investment.

You may recall that in the last lesson we had made a distinction between autonomous investment and in- duced investment. The investment which comes about as a result of innovations including the 'technological innovation' fall in the category of 'autonomous investment'. Similarly, increase in population in itself creates a need for some additional capital to increase production to meet the demand for a growing population. The investment which is caused by a growth in population is also autonomous investment.

Self Check Exercise-2

Q1. Write a note on Technology and Investment.

9.5 Level of income and investment

It has been observed in practice that the volume of investment is highly correlated in a direct manner with the level of profits. This is something which is generally expected on a priori grounds too. High profits act as incentive to higher investment. Moreover, since profits, especially in an advanced economy, are also an important source of financing investment, higher profits are expected to induce larger investments. Therefore, if one likes, investment can be made a function of the level of profits. But, the level of profits itself is found to be positively correlated with the level of income. There- fore, it has become customary to treat investment as a function of the level of income. This function may be written as 1=f (Y). You may again recall from the previous lesson that the investment, which is a function of the absolute level of income or of the change in income, is induced investment.

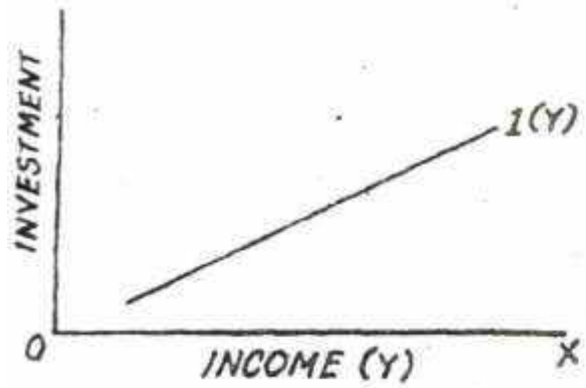


Fig. 9.1

The functional relationship between the level of income and induced investment is a direct one; investment increases with an increase in the level of income and decreases with a decrease in income. Two important reasons for this direct relation between the level of income and investment have already been suggested in the above paragraph. These reasons emphasise the effect of the level of income on the volume of investment through the effect of the former on profits. A rise in income raises the level of profits which induces the entrepreneurs to increase their investments. Secondly as already stated, rise in profits increases the internal sources of finance which facilitates increase in investment expenditure. As Meyer and Kuhn observe, while profits may be proximate cause of investment, their dependence on the output level really means that output ultimately determines the investments levels" (if The Investment Decisions).

An additional factor, that is appealed to in order to justify the hypothesis that investment is a direct function of output or income is that a higher level of output re- quires a larger capital stock to make it feasible, if technology remains constant. Capital stock can be increased only through increased investment. Hence this factor too points out towards a direct relation between the level of output or income and the level of investment, where the level of output is regarded as the independent variable and the level of investment as the dependent variable.

If the above arguments are accepted, the induced investment function will have the shape of I (Y) function in Fig. 9.1 above, It is reasonable to assume that such a function will cut the income axis OX, to the right of the origin, indicating thus that, at some minimum level of income, the rate of net investment would be zero. All factors other than income, which influence investment such as technology and innovation, the rate of interest and the size of population, are the parameters of the induced investment function, I (Y), A change in any of these parameters will shift the I (Y) function up or down.

We had seen earlier that investment is also a function of the rate of interest, though opinions differ regarding the interest-elasticity of investment function. When we consider investment as the function of the rate of interest, the level of income becomes a parameter of the interest-investment function. I (r) Whatever be the interest-elasticity of the investment function, it is now acknowledged that investment is a function of both, the level of income as well as the rate of interest, so that we can write the investment function as I=I (Y, r). This is not intended to imply that other factors such as technology, innovations and the size of population are irrelevant. It implies only this that in a short period, at least, the level of income and the rate of interest are much more relevant factors influencing investment.

Self Check Exercise-3

Q1. Write about the relationship of Income and Investment.

9.6 The Accelerator Theory of Investment :

Many economists, although they agree that income is a very significant variable affecting investment, argue that it is the change in the level of output or income and not the absolute level of it, which is a significant determinant of the volume of investment. They argue that once the capital stock of an economy is adjusted to the going rate of output, there is zero net investment. All new investment is only the replacement investment. But, if the rate of output rises to a higher level, it calls for an increase in the capital stock to adjust it to the new level of output. This need for capital stock adjustment induces a positive net investment over and above the replacement investment. Once this adjustment has been made and there is no further rise in the level of output, the net investment will again fall to zero and the gross investment will equal the replacement investment alone, regardless of the level of output. Hence, it is suggested that net investment is a function not of the absolute level of income but of the change in the level of income, so that the induced investment function may be written as $I=I\ (\Delta Y)$. This proposition in the theory of investment has come to be known as the accelerator theory of investment.

Let us see how net investment depends on change in the level of output. Under a given technology, there is some definite amount of capital needed to produce, on the average, one unit of output. This is technically known as the capital coefficient or the capital-output ratio. Supposing an investment in fixed capital equipment of Rs. 300 is required to produce an output valued at Rs. 100 at constant prices, the capital-output ratio then, will be 300/100 or 3. The general formula is: $a=K/Y$ (1) where a is the capital-output ratio, K the capital stock and Y the amount of output. From this equation (1), we can determine the capital stock needed to produce the output of any given period. For example, in the current period, t, the capital stock needed would be

$K_t = aY_t$..(2)

And for the preceding period, t—1, the required capital stock would be

$K_{t-1} = aY_{t-1}$..(3)

From (2) and (3) :

$K_t - K_{t-1} = aY_t - aY_{t-1} = a\ (y_t - Y_{t-1})$ ....(4)

The left hand side of equation (4) represents the change in capital stock or net investment in the current period, t ; and the extreme right hand side represents the change in output in the current period, t, multiplied by the capital-output ratio, a. Thus, this equation shows that net investment depends on the capital-output ratio (a) and the change in income ($Y_t - Y_{t-1}$)

The dependence of net investment of the change in the level of output is referred to as the Principle of Acceleration or the Principle of Derived Demand as one of its original propounder, J.M. Clark, named it. The capital-output ration ('a' in our example) is called the Accelerator.

The proposition that net investment is a function of. the change in the level of output has been given the name, Principle of Acceleration, because, provided the capital-output ratio is greater than one, a given increase in output increases the net investment by more than the increase in output. By how much? Well, this depends on the value of the parameter, a, that is, on the capital-output ratio.

Let us now see how the principle of acceleration works. We shall assume that the capital-output ratio is 3 (i.e. a=3) and the price level is constant. We shall also assume that the capital stock needs replacement (due to wear and tear as well as obsolescence) at the average rate of say, 10 percent.

The table given below shows that when there is no change in output from period, t, to period, i+1 there is no change in investment. The gross investment just equals replacement investment and the net investment is zero. But, in period t+2, the output increases from 100 to 110. In consequence of it the net investment increases from zero to 30, while the gross investment increases from 30 to 60. Thus, we find that only a 10 percent increases in output causes an increase of 100 percent in the gross investment. In the next period t+3, the output increases by 15 or by less than 14 per cent, but the net investment increases from 30 to 45 or by 50 per cent, while the gross investment increases from 60 to 75 or by 25 per cent. In the next period t+4, output increases by 10 or by 8 per cent. But the net investment as well as the gross investment falls. This suggests that an increase in the absolute level of output is not enough for investment to increase continuously, it must increase at an increasing rate.

Period	Output (Y)	Required Capital $K_1=aY_t$ a = 3	Replacement Capital (R) = 10%	Net Investment $(K_t–K_{t-1}$	Gross invest. = Net invest. + Rep. invest. = $(K_t–K_t–1 + R)$
t	100	300	30	0	30
t+1	100	300	30	0	30
t+2	110	330	30	30	60
t+3	125	375	30	45	75
t+4	135	405	30	30	60
t+5	140	420	30	15	45
t+6	135	405	30	–15	15
t+7	125	375	30	–30	0
t+8	120	360	30	–15	15

In period t+6 there is a fall in the absolute level of output too, as a result of which net investment becomes negative, which means that the gross investment is less than the replacement investment. Even though net investment can become negative, it can never be negative by more than the replacement investment. This means that gross investment can, at worst, be zero, but it can never be negative. That is why it is said that the working of the principle of acceleration is not symmetrical; it does not work down-ward the same way as it work up-ward.

The very simple type of the Accelerator Model depicted above provides us with some useful insights into the problem of fluctuating output. In the first instance, it explains, to some extent, as to why output fluctuations during a cycle are greater in the investment goods sector than in the consumers' goods sector. It also provides a partial explanation of the down-turn of a business cycle. Unless the output or income goes on rising at an increasing rate, investment must begin to fall. The fall in investment through the multiplier effect, which we shall consider in the next lesson pulls down the level of output itself. It also shows why the peaks and the droughts during a cycle show themselves earlier in the capital goods than in the consumer goods industries.

The mechanical operation of the Acceleration Principles as illustrated in the above rather too simple model is based on a number of assumptions, non fulfillment of which would limit the validity of the principle.

One of these assumptions is that there is no excess capacity available in the consumer goods industries, for, if it is available a rise in the output of final goods is not contingent upon an increase in the capital stock, that is. it need not call forth positive net investment. It is because the existing excess or idle capacity can be used to meet the increased demand for final goods. Even when this assumption is likely to be satisfied in the case of an individual industry it is not likely to be fulfilled in the case of the economy as a whole, except towards the last phase of expansion in a business cycle, when excess capacity tends to disappear.

Secondly, it assumes that while there is no excess capacity in the consumer goods industries, excess capacity is available in the investment goods industries, otherwise how are we going to increase the capital stock of the economy."

The principle also assumes unrealistically that any rise in demand surely calls forth increase in investment. But this is not true, because unless the rise in demand is believed to be permanent the entrepreneurs will not try to increase the capital stock and hence, investment will not increase. This means that the principle will not work, if the rise in demand for final goods is believed to be temporary. The producers may, then, raise their prices rather than increase the output. Furthermore, even if the entrepreneurs decide to increase output rather than increase prices, it need not imply an increase in capital stock. If the entrepreneurs are uncertain about the permanence of the rise in demand for their goods, they will try to produce more with their existing plants rather than extend their plants.

Moreover, the principle ignores the technological consideration that the capital equipment is not perfectly divisible so that every increase in demand does not justify an increase in capital stock.

The principle of acceleration is based upon assumption of a constant capital-output ratio. This makes the principle highly mechanical. As Duesenberry has shown in his Business Cycles and Economic Growth, it is possible to substitute labour for capital and vice versa within even a given technology. According to him, there may be upper and lower limits to the amount of capital used per worker or per unit of output with any given basis process. But in most cases they must be fairly wide, and choice of capital-output ratio within those limits will depend on the relative factor prices. Therefore, the assumption of a constant capital-output ratio is not justified. An additional consideration that goes against the assumption of a constant capital-output ratio and the constant accelerator is that the capital output ratio varies from industry to industry. The degree to which investment is induced by an increase in demand for final output depends on the distribution of that increase in demand among the different industries having different capital-output ratios.

The latter point in the preceding paragraph points to another limitation of the Acceleration Principle There disaggregation of investment by industries may reveal that net investment may rise even without an increase in the total demand and output. If the demand for the goods at of industries with higher capital-output ratios increases at the expense of the demand for the goods of industries will lower capital-output ratios, the net investment may rise even though the aggregate demand and output remain the same.

Still another flaw in the Acceleration Principle is that it assumes incorrectly that the amount of real capital perunit of output, which a firm desires, is independent of the cost of raising funds for investment and that the cost of raising funds for investment is invariant with respect to the amount raised. In fact, this principle completely ignores the financial aspect of investments. Cost of financing investment increases with increase in investment. In the short period, it may induce firms to m exploit their existing capital stock more intensively; therefore, the Acceleration Principle may not work. Over a longer run alternative techniques can be made pos available. Different techniques have different capital output ratios. Therefore, the Principle of Acceleration will not work in the simple way indicated in the above model.

What can be said, in conclusion, with respect to the Acceleration Principle in view of the above qualifications? Most economists are of the opinion that the general notion underlying this principle is correct, but it "does not justify the use of any rigid proportionality between increase in income and the rate of investment except under very exception circumstances". (Duesenberry, Business Cycles and Economic Growth) A.D. Knox in his paper entitled, "The Acceleration Principle and the Theory of Investment" also observes to the same sum there is an element of truth in the Acceleration Principle and but it is an element that is so heavily overlaid by other factors that the Acceleration Principle by itself is inadequate as a theory of investment."

Self Check Exercise-4

Q1. What is Accelerator theory of Investment.

9.7 Summary

The Principal of acceleration is based on the fact that the demand for capital goods is derived from the demand for consumer goods which the farmer help to produce. The acceleration principle explains the process by which an increase (or decrease) in the demand for consumption goods leads to an increase (or decrease) in investment on capital goods. According to Kurihara, "The accelerator coefficient is the ratio between induced investment and on initial change in consumption expenditure.

9.8 Glossary

Professor Kurihara Points out that a less than unity marginal propensity to consume provides an answer to the Question. Why does the cumulative process come to a stop before a complete collapse or before full employment? According to Hansen, this is due to the fact that a large part of the increase in income in each period is not spent on consumption in each successive period. This eventually leads to a decline in the volume of induced investment and when such a decline exceeds the increase in induced consumption, a decline in income Sets in. Thus Professor Hansen said, "It is the Marginal propensity to save which calls a halt to the expansion process even when the expansion is intensified by the process of acceleration in top of the multiplier process.

9.9 Answers to Self Check Exercises.

Self Check exercise -1

Ans.1. Refer to Section 9.3

Self Check exercise -2

Ans.1. Refer to Section 9.4

Self Check exercise -3

Ans.1. Refer to Section 9.5

Self Check exercise -4

Ans.1. Refer to Section 9.6

9.10 SUGGESTED READINGS

1. J.M. Keynes : The General Theory of Employment. Interest and Money Ch. 11,12
2. G. Ackley : Macroeconomic Theory, Ch. 17.
3. E. Shapiro : Macroeconomic Analysis.Ch. 12.13
4. M.G. Mueller (ed) : Readings in Macro-economics. Reading No. 9 by A.D. Knox.
5. W. H. Branson : Macroeconomic Theory and Policy Ch. 11
6. R. Eisner : A Permanent Income Theory of Investment. "American Economic Review, June, 1967.
7. D.W. Gorgenson and C.D. Siebert : "Theory of Corporate Investment Behaviour," American Economic Review, Sept, 1968.

9.11 Terminal Questions

Q.1 Explain and Examine the Accelerator theory of investment.

Q.2 Explain and Examine the profit theory of investment.

****

Unit - 10

(A) FINANCIAL THEORY OF INVESTMENT BEHAVIOUR

(B) LAGS IN INVESTMENT

Structure

10.1 INTRODUCTION

In the preceding two lesson we considered two theories of investment behaviour in relatively greater detail. We are here referring to the MEC theory of Keynes and the Accelerator Theory. While presenting the various deficiencies and limitations of the accelerator theory of investment we had specifically mentioned that this theory was specially deficient, as it implicitly assumed that no problem could arise with regard to financing the desired investment as warranted by the principle of accelerator. The Keynesian theory, on the other hand, did appear to take some note of the financial aspect of investment, if we take the rate of interest to imply the cost of financing investment in the Keynesian theory. However, in this theory rate of interest is considered to be merely a datum which enters into the model exogenously. In fact, Keynes was rather too emphatic in asserting that the rate of interest was a monetary phenomenon and was unaffected by investment demand. Thus even if we regard the rate of interest as the cost of financing investment in the Keynesian theory, the treatment, in this theory, of the financial costs of investment is at least too superficial and peripheral. The role of finance in determining investment demand has been, more or less, neglected in this theory too.

10.2 Learning Objectives

After going through this chapter you will be able:

- To understand Role of Finance and the Conventional theories of Investment
- To understand the financial theory of Investment
- To understand cyclical fluctuations and Investment
- To understand Lags in Investment

10.3 Role of Finance and the Conventional Theories of Investment

None would deny the basic relationship between the rate of interest and investment demand postulated in the Keynesian theory. But it severely simplifies the role of finance in the determination of investment demand by delimiting it to only one element, namely, the market rate of interest. But the critics point out rather quite realistically that there is no such thing as the market rate of interest. On the contrary, they point out, there is a whole range of interest rates. The conventional practice of assuming only a single uniform of interest would imply that funds are available in unlimited quantities to all types of borrowers. This is, in fact, the implication of the horizontal interest-rate line by Keynesian model which enters the model exogenously and determines the investment demand by interacting with the negatively sloping MEC (marginal efficiency of capital) or MEI (marginal efficiency of investment which is only a refined form of MEC) curve. But in real life, each and every borrower is not able to borrow at one uniform rate of interest, It is because the rate of interest which is charged from any particular borrower depends on a number of variables such as the term of the loan, the size of the loan, the security offered and perhaps, above all, the credit in thiness of the borrower. Moreover, it is an unrealistic assumption that unlimited supply of finance is available to any particular borrower at a given rate of interest. On the contrary, the observable fact is that this rate of interest for a particular borrower has some tendency to rise with each addition to his borrowings per unit of time, provided all other things remained constant.

The Keynesian theory is also fundamentally weak as it implies that firms can secure finances for investment only through borrowing in the money market. But in real life there are three sources of funds which can substitute for as well as complement each other. These three sources of financing investment are: (a) Undistributed profits and depreciation funds of the firms which are known as the internal sources of finance of the firms, (b) borrowings from banks or in the bond market (This, in fact, is the only source of finance stipulated in the conventional theories of investment): and (c) equity capital, that is, raising of finances through the issue and sale of new stock of shares. These different methods of financing investment have different costs and they involve different risks, nevertheless the cost of funds raised from each source can be expressed as a percentage and can therefore be compared with each other. All these factors and their impact on investment demand had been ignored in the conventional and main stream text book theories of investment. The financial theory of investment removes this lacuna by highlighting these hitherto neglected factors and exploring and explaining their implications for determining investment demand. It was J.S. Duesenberry who, probably for the first times, called attention to this neglected area and highlighted the role of finance and the various sources and costs of financing investment in determining the investment demand. He presented his views on the subject in his work, Business Cycles and Economic Growin. In the following section we shall expound the financial theory of investment as presented by Duesenberry in his work referred to above.

Self Check Exercise-1

Q1. Discuss the role of Finance and the convention theories of Investment.

10.4 The Financial Theory of Investment

The financial theory of investment emphasises the role of finance in determining the volume of investment demand. Moreover, it rejects the Keynesian assumption that unlimited of finance can be had at the prevailing rate of interest. In other words, it rejects the proposition that the supply curve of finance is horizontal. The financial theory takes note of the various sources of finance available in a modern economy and the costs implied in them. On the basis of such objective factors it derives supply curve of finance which is entirely different from the conventional horizontal supply curve of the standard macroeconomic theory of investment.

The financial theory points out that a firm has, broadly speaking, two types of sources of finance: the internal sources and the external sources. The internal sources are comprised of the undistributed profits and the depreciation funds of the firms. The undistributed profits are that portion of the profits of a firm which is not paid out to its share holders in the form of dividends. The external sources of finance of a firm consist of borrowings from the banking system, issue of debentures and the issue of new stocks of shares in order to gather equity capital. Having identified the different sources of finance, the financial theory considers the behaviour of costs of the supply of finance from each source and then through a process of aggregation arrives at the aggregate supply curve of finance.

The theory points out that the internal source is the cheapest source of finance and the firms generally make use of this source as the first resort. The cost of using the internal funds lying in the depreciation and reserve funds is the opportunity cost of using these funds for investment purposes. The alternative use of these funds is to lend them out rather than invest them. Funds in a modern economy are general' lent out by purchasing securities promising fixed yield per unit of time. Since the banks as well as the non-banking financial institutions generally have a higher lending rate than the de posit rate, it is obvious that the opportunity cost of using internal funds for investment is less. It is because the purchase of securities will give a rate of yield equalling the deposit rate which is less than the rate which the banks and other financial institutions would charge, if the investment was financed by borrowing from these institutions. Therefore, at this implicit (opportunity) cost, the internal funds are the cheapest and the marginal cost of supplying finance from this source remains constant as shown by the segment AB of the MCF (marginal cost of finance) curve in Fig. 10.1 below.

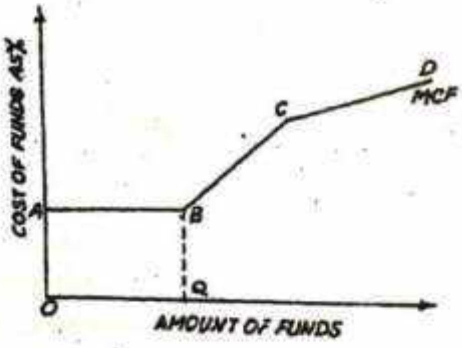


Fig. 10.1

This implies that OA is the opportunity cost of using internal funds of the firms for investment, but the internal funds have the maximum limit of OQ. For further investment funds the firm has to take resort to the external sources. The segment BC of the MCF curve in Fig. 10.1 above indicates the rising cost of borrowed funds. The rate of interest on borrowed funds is likely to rise with the increase in the amount of funds borrowed, because as the firm becomes more and more indebted within a time period, the risk factor rises, to cover which the firm is charged a higher rate of interest.

As borrowing from banks and other financial institutions becomes more and more costly, a stage is eventually reached when the firm considers that it is more economical to finance its investment through equity issue than by borrowing. This is shown by the segment OD over the MCF curve above in Fig. 10.1 Equity issue as a source of finance is employed by a firm only when the cost of borrowing funds from financial institutions becomes too high because initially the cost of equity funds is greater than the cost of borrowed funds. This explains the CD segment representing equity funds in Fig. 10.1 being at a higher level than the BC segment which represents the borrowed funds. There are a number of reasons on account of which the cost of equity funds is greater than the cost of borrowed funds. The most important among these is the differential treatment of interest and dividends within the tax system. Interest paid by a firm on the borrower funds is deducted from its income (profits) in order to arrive at taxable income but its dividend payments which are in a way the cost of equity funds are not deducted from its / income for income-tax purposes.. Assuming corporate income tax rate to be even fifty percent which is not uncommon, the cost of equity funds to a firm will turn out to be double that of borrowed funds. If, for example, the rate of interest payable on borrowed funds is five percent, a firm will have to earn at least ten percent profits in order to provide its share holders a divided at the same rate, that is, five percent, if the same amount of funds was to be raised through equity issue, otherwise the issue will not be subscribed to. This is indeed the double the rate of earnings necessary to ensure debt servicing at the rate of five percent. There is an additional cost of another kind also associated with equity finance. This is an implicit cost which perhaps cannot be exactly quantified but is positive at any rate. This cost takes the form of the dilution of the control of an existing group on the join stock firm as the percentage of total shares held by it will fall as the result of the fresh stock of equity. This type of cost is not involved in financing by borrowing from financial institutions or the public by the sale of debentures.

It is to be observed that apart from the CD segment being higher than the BC segment of the MCF curve in Fig. 10.1 above, it is also rising upward like the BC segment. But this upward slope of CD segment, unlike the rising slope of the BC segment, does not reflect the imputed risk, as the firm is not bound to pay dividend as it is bound to pay interest to its lenders. What this rising slope of CD segment reflects is a rising yield on the firm's stock, that is, a declining price-earning ratio, which results from the fall in the market price of its stock as the firm issues more and more of it.

There are probably some other considerations too but the considerations explained above are sufficient to suggest that the three-segment curve. MCF of Fig. 10.1 above represents the general shape of the curve depicting the variation in costs of supplying finances for investment to an individual firm. The MCF curves of all individual firms will certainly be not identical but they will be similar. They may differ with regard to position and slopes of individual segments as well as their span but in each case the MCF curve will have three segments of the kind depicted in Fig. 10.1. When the individual MCF curves of all firms are added together, we shall get a rather smoother S-shaped curved /like MCF in Fig. 10.2 below.

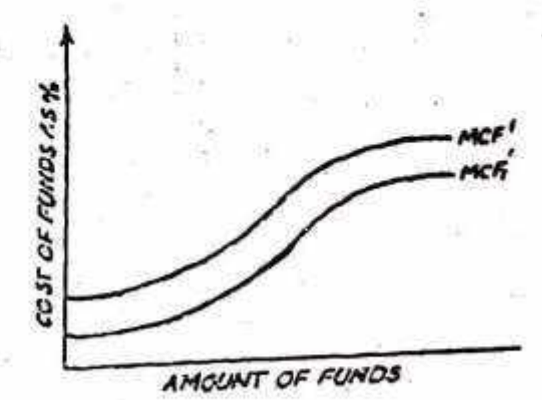


Fig. 10.2

Thus the financial theory of investment replaces the horizontal supply curve of finance implicit in the Keynesian theory with a more realistic S-shaped curve. While the Keynesian curve implied infinite elasticity of the supply curve of finance at an exogenously given rate of interest, the supply curve of finance suggested in the financial theory has less than infinite elasticity. It not only rises upwards denoting increasing cost of supply of funds as more and more amounts are required to be invested but also has three distinct segments over it which reflect the distinctive impact of the different sources of finance available to a modem business firm. The conventional concept of the interest rate as n cost is retained in it. A rise or fall in the rate of interest will shift the MCF curve upwards or downwards. A lower rate of interest, for example, will decrease the cost of both internal funds and equity funds apart from that of the borrowed funds. The cost of internal funds, as explained earlier, is the opportunity cost in the form of the rate of interest that can be earned if these funds are loaned out instead of being invested by a firm densely. This cost obviously falls with a fall in the rates of interest. The cost of equity funds also falls with a fall in the market rate of interest as this fall in the interest rate leads to a rise in the market price of equities to resines the normal relationship between the interest rate on bonds and debentures and the price-earnings ratio on couity stock. A fall in the rate of interest will thus shift one MCF curve downwards from a position like MCF to a position like MCF_1 in Fig. 10.2 above. On the other hand, a rise in the market rate of interest will shift this curve as a whole upwards.

However, the position of the MCP carvs may change position even without a change in the rate of interest. Supposing there is an increase in corporate profits as a result of which the retained earnings in the form of undistributed profits of the firms increase. Or, suppose that there is now a greater depreciation allowance permitted on account of which depreciation funds are enlarged. This will result in enlarging the internal resources of finance which will not only shift the MCF curve downwards as such but will also elongate the elastic AB segment of individual MCP curve. Their aggregation will yield an MCF carve like MCF_2 curve in Fig. 10.3 below wherein MCF_1 curve represents the original position of MCF curve before the said increase in corporate profits and/or depreciation funds.

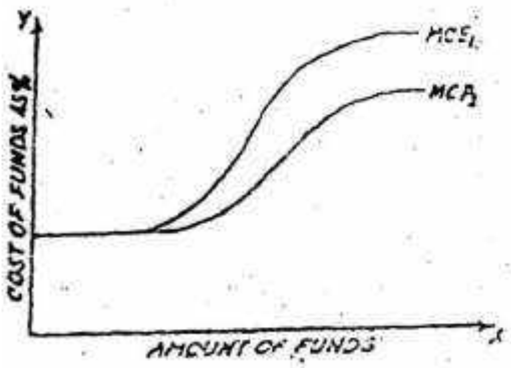


Fig 10.3

According to the financial theory of investment, the equilibrium amount of investment demand is determined by the interaction between the supply curve of finance like the S-shaped MCF curves explained above and the marginal efficiency of investment (MEI) curve which represents the demand side of the investible funds and behind which lies the Keynesian marginal efficiency of capital (MEC) curve which we explained in the lesson no.8.

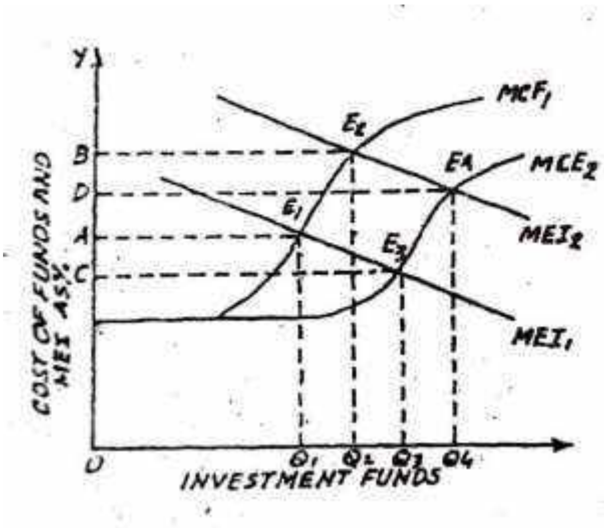


Fig. 10.4

This equilibrium is shown in Fig.10.4 below. The MCF_1 and MEI_1 curves represent respectively the initial supply curve of investible funds and the initial demand curve of investible funds. Equilibrium takes place at the point of their intersection giving the equilibrium amount of investment as OQ_1 at which the marginal efficiency of investment equals the marginal cost of supply of finance OA. This equilibrium amount of investment would be affected by both a shift in the MCF curve and a shift in the MEI curve. Supposing there is a shift in the MEI curve from position MEI_1 to position MEL_2 the position of MCF remaining the same, the new equilibrium will take place at E_2 where the shifted MEI_2 curves intersects the original MCF_1 curve. This shows an increase in the equilibrium amount of investment from OQ_1 to OQ_2 as shown in Fig. 10.4 above. The upward shift of the MEI curve may be explained either by the Keynesian expectations factor or the profit theory or the accelerator theory. On the other hand, if the MCF curve shifts downwards from MCF_1 position of MCF_2 position while the MEI curve remains in the original position, the equilibrium investment would be OQ_3. If both the curves shift-MEI to the position MEL, showing increased marginal efficiency of investment, which may be due to either optimistic change in business expectations or fising profits or rising demand for final goods or some combination of all the three factors, and MCF to the position MCF_2 showing a fall in the cost of supply of finance due either to a fall in the rate of interest or a rise in internal resources or both-the new equilibrium will take place at the point E_4 where MCF_2 and MEL_2 intersect and the new equilibrium investment would be OQ_4 which equate the MCF with MEI (=OD in Fig. 10.4).

It should be noted that while in the conventional macroeconomic theory of investment, the rate of interest remains unaffected by a change in the rate of investment, in the financial theory of investment it is visualised that any rise in marginal efficiency of investment which increases investment demand will tend to raise the rate of interest. Therefore, in its dynamic form the theory visualises an upward shift in MCF curve that would follow an upward shift in the MEI curve. This implies that the equilibrium amount of investment will increase less than what is implied in the Keynesian theory, when there is a given rise in the MEI schedule.

Self Check Exercise-2

Q1. Discuss the the financial theory of Investment.

10.5 Cyclical Fluctuations And Investment :

It is interesting to note the implications of the above financial theory of investment for the business cycle theory. As pointed out above, the forces which affect the marginal efficiency of investment may also affect the marginal cost of supplying finance, that is, a shift in MEI curve may be followed by a similar shift in the MCF curve. But it is not necessary that the extent of shift in both the cases will be the same. The relative impact of the relevant factors on the two curves may be different from time to time and may thus give different results from time to time.

When there is a severe recession and business expectations are very pesimistic, the MEI curve will shift a far the left to a position like MEI_1 in Fig. 10.5 below. On the other hand, the elastic portion of the MCF curve will be shortened as due to fall in profits and the consequent fall in retained funds in reserves, the internal sources of finance will shrink. However, the depreciation funds are not likely to disappear, even, if we suppose that other internal funds completely disappear which, in fact, may not. This implies that the elastic portion of the MCF curve may shrink, rather shall shrink, but it will not disappear. In these circumstances a shift of the MEI curve in the other direction, that is, to the right will increase investment and the interest rate will offer no barrier. In fact, not only the interest cost but the cost of supply of funds in general also will not constrain investment. This implies that interest rate is not an important financial determinant of investment during recessions. It is the retained earnings and the depreciation allowances, that is, the internal funds which act as the important financial determinants of investment in such time.

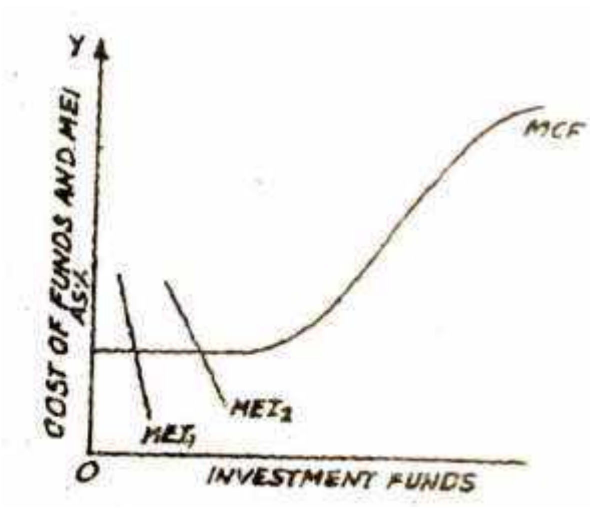


Fig. 10.5

However, as the economy revives and gets into an towards boom conditions, the MEI curve will shift far to the right to intersect the MCF curve in the less elastic portion of it as shown in Fig. 10.6 below by the MEI_3 curve. This shows that the equilibrium investment is greater than the funds which can be supplied by the internal sources. The firms have now to result to borrowing also and consequently the rate of interest now becomes an important financial determinant of investment. What is the extent to which a rightward shift of MEI curve say from MEI_3 to MEI_4 in fig. 10.6 will increase investment will now depend on the elasticity of the portion of the MCF curve representing the borrowed funds. The more elastic is it, the less will be the rise in the rate of interest and consequently the greater will be the increase in investment. On the other hand, if this portion of MCP curve is less elastic, the greater will be the rise in interest rate and smaller will be the increase in investment.

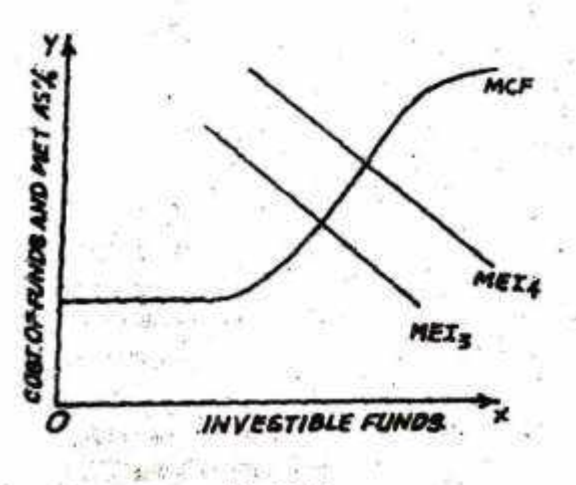


Fig. 10.6

The most important implication of the financial theory of investment as explained above is that the influence of financial factors on investment cannot be judged solely on the basis of the market rates of interest. As explained above, changes in the interest rates may be of little or no consequence for investment determination at certain times such as recessions and depression. On the other hand, they may exert a considerable influence at other times such as during upswings and boom periods.

The above financial theory also implies that the conventional textbook macroeconomic theory of investment which summarily reduces the cost of finance to interest cost only is too much of a simplification and does not correspond to the facts of modern industrial financing.

Self Check Exercise-3

Q1. What do you know about cyclical fluctuations and Investment.

10.6 Lags in Investment

The modern theory of investment as presented by William H. Branson in his Macroeconomic *Theory and Policy* may be summarised in the form of an equation as follows:—

(1) $i_g = i_a + i_r = \Delta\, K^E\,(y, C, P) + \delta\, K$

where i_F, is gross investment ;

i_n is net investment ;

i_r is replacement investment ;

K^E is the desired or equilibrium capital stock ;

y is real output ;

C is user cost ;

P is price level ;

δ K is depreciation of capital stock

The above eqution seeks to convey that the total investment or gross investment (i_g) is made up of two components, i_r and i_n. As regards i_r, it equals δ K where δ upresents the rate of depreciation and K is the existing capital stock. As regards net investment (i_n), it is the increase of desired capital stock over the existing capital stock (ΔK^E) which the above equation shows as the function of the level of output (y), user cost of capital (C) and the price level (P).

Lags in investment are, in fact, concerned with relationship between changes in K^E and changes in i_n that is, changes in the desired capital stock and the consequent changes in net investment. Since a change in desired capital stock does not instantaneously lead to a change in net investment, there is bound to be some time lag between the two in the dynamic situations of the real world. But before we explain, caese lags, let us explain the general theory embossed in equation (1) above a little further.

The user cost (C) is defined as,

(2) $C = P_1 (r—P_1 + \delta)$

where P_1 is the purchase price of a capital good or machine or plant ; P_1 is proportional capital gain which results from a rise in the cost and price of similar capital good ; δ is the rate at which the capital stock depreciates ; and r is the rate of interest which is the weighted average of the three rates of interest, namely, the rate of interest implicit in the use of internal funds (r_1), the bond rate of interest representing the interest rate on borrowed funds (r_D), and the equity rate of interest representing the cost of equity funds (r_E). That means :

(3) $r = w_1 r_1 + W_D r_D + W_E r_E$

W_r, W_D and W_E are the weights assigned to the respective rates of interest which equal the fraction of the total investment financed by the respective source ;

that is, $W_1 = \frac{Internal Fnds employed}{Total Investment}$

$W_D = \frac{Borrowed\ funds}{Total\ Investement}$ and $W_E = \frac{Market\ Value of Capital Stock}{\mathrm{Re}\ placement\ \mathrm{cost} of\ Capital}$

The demand for investment as implied in the above summary of the modern theory of investment may be regarded as the function of two variables, namely, the demand for the output of the firm (y) and the real user cost (C=) of capital goods. The theory implies that if the cost of capital goods goes up relative to the cost of labour for a given output, we would expect a firm to use more labour and less capital, and we will also expect output to be less than before. On the other hand, if, for a given cost of capital, the demand for output rises, we will expect a firm to increase the use of both labour and capital and also to produce a larger output: The latter, in fact, incorporates the principle of accelerator.

It should also be noted that *ex ante* factor proportion (capital/labour) is variable as alternative technologies are assumed to be available. But once a given technology is adopted, the factor proportion becomes fixed ex post. Thus the investment is supposed to be a "putty-clay" investment. It is "putty" ex ante but "clay" *ex post.*

Now we shall try to see how changes in demand and changes in the cost of capital will affect the actual time pattern of investment given the "putty-clay" production function. This problem involves the consideration of time-lags in investment.

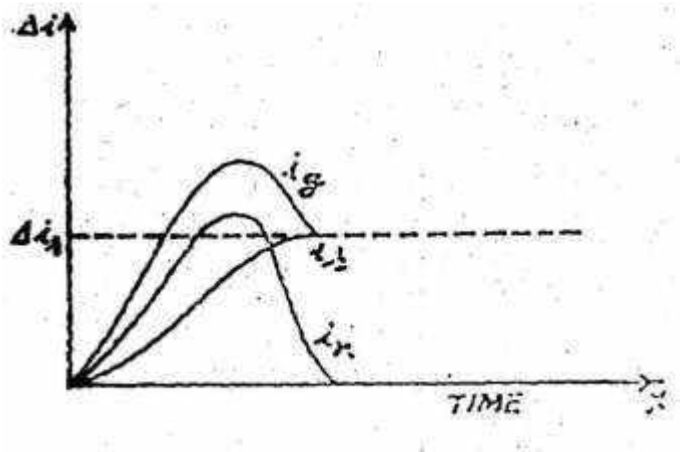


Fig. 10.7

We may first take up the case of lag between change in demand for output and change in investment. As the output of the existing plant of a firm is fixed ex post, if the firm expects the new level of demand to be permanent and wants to respond to it, it will add to its plant immediately in the absence of excess capacity.

This response is depicted in the above diagram of Fig. 10.7. The in the output demanded (ΔY) ultimately increases the desired capital stock by ΔK^E but only after a time lag. The replacement investment (*i*) rises gradually as shown by the i_r curve in Fig. 10.7. The increase in net investment will be rather faster as shown in i_n curve. Adding the two curve together we get the gross investment curve i_g. Within a short time the total capital stock is increased by the amount equalling the area under the i_n, curve. As there is higher capital stock now, there is an increase in the level of replacement investment by an amount equalling Δi_r so that the path of total investment is shown by the I_g curve in Fig. 10.7.

The main point to be noted here is that the increases in I_r i_n and i_g take place with a short time lag due to the ex post fixity of output capacity of the existing plant and the need to add to the plant to meet the increased demand for output which is preceived to be permanent.

Now let us consider the other case when initial impetus to increase in investment comes not from an increase in the demand for a firm's output but from a fall in the relative cost of capital. The main effect of a fall in the relative cost of capital is to substitute capital in place of labour. But this substitution cannot take place on the existing "clay" plant.

A different technology and therefore a different plant will be required for that purpose. The firm will gradually replace its old plant with a new type of plant embodying a higher capital/labour ratio. The result is that with this fall in the user cost of capital there is a much longer process of change than in the earlier case of an increase in demand examined above. In other words, the investment lag in this case is longer than in the case of increase in demand. This is shown diagrammatically in Fig. 10.8 below.

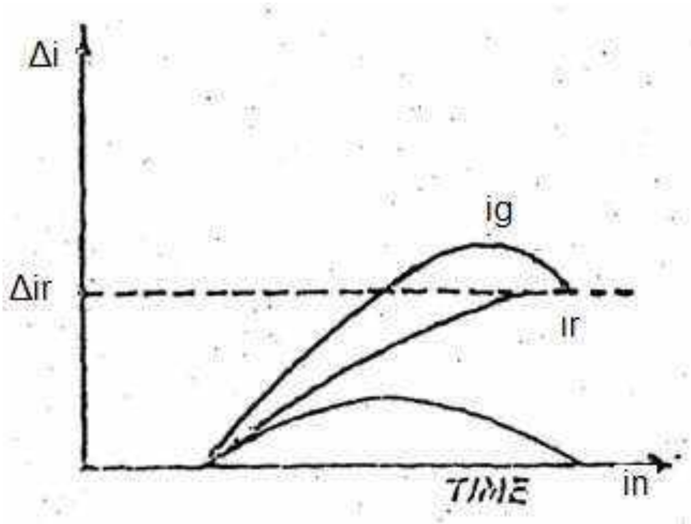


Fig. 10.8

Some econometric modelling and empirical work have been done on this problem in the U.S.A. Such a study by Charles W. Bis) Choff shows that the effect of a sudden increase in output demanded by 10 percent on gross investment peaks at three quarters and levels off after five quarters when time is measured in quarters. On the other hand, the effect of a ten percent decrease in the user cost on gross investment peaks at 20 quarters and levels off at 26 quarters or so. The former corresponds to the implication of our diagram in Fig. 10.7 above while the lather corresponds to the implication of our diagram in Fig. 10.8 above.

Self Check Exercise-4

Q1. What do you know about Lags in Investment.

10.7 Summary

The Financial theory of Investment is associated with the names of James Duesenberry Meyer, KUL, W. Locke and Anderson. The essential feature of Duesenberry's theory of Investment is that the volume of investment is determined by the equality between Marginal efficiency of investment and the Marginal cost of capital. This approach is closer to the neoclassical position.

It is possible to view the cost of funds in two ways depending upon whether the firm relies upon internal funds of external funds. The internal funds are constituted by retained profits and depreciation. The external funds are made up of borrowing from financial institutions or the funds procured through the sale of bonds or issue of equities. In the case of internal funds, the cost of funds is computed in terms of the opportunity cost. It is the yield that the firm can obtain by using the funds for the purchase of internal bearing assets. In the case of external funds there is direct interest cost. If the cost of external funds is more than the opportunity cost of using internal funds, the firms will tend to prefer internal source of finance to the external source. If the cost of external funds is substanlially higher than the oppertunity cost of internal funds, It is even More Likely that the firms limit their investment only upto the amount of internal funds available to them.

10.8 Glossary

James Tobins theory of Investment-Links a firm's investment decision to fluctuations in the stock market. Firm's Investment devisions depend on the following ralio called Tobin's q.

$$q = \frac{Market\ Value of\ Capital Stock}{\mathrm{Re}\ placement\ \cos t of\ Capital}$$

The market value of firm's capital stock in the numerator is the value of its capital as determined by the stock market. The replacement cost of firm's capital in the denominator is the actual cost of existing capital stock. If it is purchased at today's price. Tobin holds that net investment would depend on wether it is greater 1 ($q > 1$) or less than 1 ($q < 1$)

If $q > 1$, the Market Value of firm's share in the stock market is more than the replacement cost of its real capital. The firm can buy More capital and issue additional sharer in the stock market. In this way, the firm can earn profit and finance new investment by selling more shares. Conversely of $q < 1$, the market value of its shares is less than its replacement cost and the firm will not replace capital as it wears out.

10.9 Answers to Self Check Exercises

Self Check exercise -1

Ans.1. Refer to Section 10.3

Self Check exercise -2

Ans.1. Refer to Section 10.4

Self Check exercise -3

Ans.1. Refer to Section 10.5

Self Check exercise -4

Ans.1. Refer to Section 10.6

10.10 SUGGESTED READINGS

1. E. Shapiro, Macroeconomic Analysis, Ch. 12
2. J. S. Duesenberry, Business Cycles and Economic Growth, Ch. 3.5
3. C.W. Bischoff, "The Effect of Alternative Lag Distributions" In G. From (ed.) Tax Incentives and Capital Spending
4. W. H. Branson, Macroeconomic Theory and Policy Ch. 11

10.11 Terminal Questions

Q.1 Explain and examine the financial theory of Investment. However it differs from the other theories of investment.

Q.2 Explain the modern theory of investment.

****

Unit- 11

ALTERNATIVE THEORIES OF DEMAND FOR MONEY

Structure

11.1 INTRODUCTION

We shall be dealing with the various theories of the demand for money in the present lesson. The subject is quite important, because it bears upon the question whether a freely competitive system will or will not automatically work towards full-employment equilibrium; and, secondly, whether a situation of under-employment equilibrium can or cannot be corrected through a monetary policy. Different schools of thought have different answers to these questions and this difference arises, at least partially if not wholly, from the varying assumptions made with respect to the nature of the demand for money. This explains why we need the understanding of the alternative theories of the demand for money.

11.2 Learning Objectives

After going through this chapter you will be able:

- To understand classical theory of demand of money
- To understand Keynesian theory of demand for money
- To understand Post-Keynesian developments
- To know port-folio balance approach
- To know wealth effect and demand for money

11.3 The Classical Theory of Demand for money:

The earliest explanation of the nature of demand for money is to be found in the writings of the classical economists, and this explanation is embodied in the famous Quantity Theory of Money. The Quantity Theory of Money, in the popular mind. is associated with the explanation of the general price level. But, as Friedman has emphasised in his Restatement of the Quantity Theory of Money", it is essentially a theory of the demand for money rather than of the price level.

The Quantity Theory of Money is derived from what is known as the Equation of Exchange : MV = PT, where M, V, P and T represent respectively, quantity of money. transaction velocity of money. price level and the volume of transactions of all types including transactions in old goods as well as newly produced goods. Transaction velocity of money means the average number of times a unit of money is exchanged against all types of goods. The old as well as the newly produced during a given period of time. This is the Fisherine version of the Equation of Exchange. We can Saintly modify it so that the volume of transactions (T) is substituted by the volume of real income (Y) which includes only the newly produced goods during a given period of time. With this modification the Equation of Exchange takes the form: MV = PY, where V is now the income velocity of money, that is, the average number of times a unit of money is exchanged against newly produced goods during a given period of time.

The right-hand side of the above Equation of Exchange gives the money value of the national income. The quantity of money needed to buy it will, therefore, depend on the money value of national income (PY), on the one hand, and the velocity of money (V) on the other. Hence the demand for money M, is given by the equation : M = PY/V. This equation tells us that the demand for money is an increasing function of the size of real income (Y) as well as of the price level, and it is a decreasing function of the velocity of money (V). This result follows rather tautologically from the Equation of Exchange which, in fact, is only a definitional equation. However, the money demand equation. M-PY/V is a theory because the classical quantity theorists make a hypothesis with regard to the behaviour of the velocity of money. This hypothesis is that the velocity of money (V) is an institutional constant, which implies that the value of V depends on the institutional factors related to the mode of payment. In general, the shorter is the period of payment of wages and salaries, the lower is the proportion of money income that would be held in the form of cash balances to satisfy the needs of transacting business. Stated otherwise, it implies that the shorter is such a period, the greater is the velocity of money. Now, the institutional factors which determine the mode of making payments do not change over short periods. Therefore, the classical theory assumes the velocity of money (V) to be constant. Thus, this hypothesis leads to the classical conclusion that the demand for money, varies directly with the money value of national income. The classical demand function for money, therefore, can be written as: $M = f(Y, P)$. Or, we may say that the demand for money is the demand for real balances, when the real balances (m) are defined as the nominal money (M) divided by the price level (P). The classical demand function may, then, be written as $m = M/P = I/V.Y$.

It can be seen that the classical theory of the demand for money assumes that the function of money is merely to act as a medium of exchange. It fails to see that money serves also as a store of value. It recognise the transaction motive for demanding money, but it loses sight of the asset demand for money.

We have so far discussed the classical theory, its Fisherine form, which can be easily converted into its Cambridge form : $m = M/P = KY$, where K is the Marshallian constant representing the proportion of real income which prefer to keep in form of money balances. The coefficient K is but the reciprocal of the velocity of money : $K = I/V$. This pinpoints the classical conclusion that the demand for real balances is proportional to real income, with the coefficient of proportionality remaining constant over short periods.

The implication of this theory, of demand for money is that any increase in the supply of money will be got rid of by the people by purchasing income yielding assets, for, income and prices remaining the same, they are satisfied with the nominal money balances they are already holding. This will push up the prices of the assets (e.g. bonds and securities) and pull down the rate of interest. If we make the additional classical hypothesis that investment is interest-elastic, the fall in the rate of interest will increase investment. If the system is in a state of underemployment of resources, the increase in investment will mobilise the unused resources for production and the real income (Y) will increase. This argument presumes that, despite there being a situation of excess supply, the price level of goods does not change. It suggests that even when the prices are not flexible, it is possible to bring about a state of full employment equilibrium through an appropriate monetary policy, which increases the quantity of money to cause a sufficient fall in the rate of interest so that full-employment saving equals the full-employment level of investment.

What does the classical theory of demand imply, if the initial situation is one of full employment and there is an increase in the quantity of money? The people get rid of the unwanted money either by spending it on consumer goods and/or by buying income yielding assets. This will push up the prices of goods as well as the assets. The rise in the asset prices lowers the rate of interest. But it will increase only the prices of capital goods as idle resources are not available. Investment in money terms increases but in real terms it remains the same. Ultimately, when a new equilibrium is achieved, the real income (Y) will be found to be the same as in the initial position. But the money value of it (PY) will be found to have increased in the same proportion in which the quantity of money is increased the quantity of money, for example, will double the price level (P) as well as the money income (PY) K or its reciprocal, V. being a constant, the demand for holding nominal money balances will also be doubled.

Self Check Exercise-1

Q1. What do you know about the classical theory of demand for money?

11.4 The Keynesian Theory of Demand.

The Keynesian theory of demand for money, is an advancement on the classical theory, for, it recognises the function of money not only as a medium of exchange but also as a store of value. It recognises not only the transaction demand for money but also the asset demand for money.

Keynes believed that there are three motives for demanding money: the transaction motive, the precautionary motive and the speculative motive. His analysis of the transaction and precautionary motives for demanding money was identical with the classical analysis. Hence, he too believed that this component of the demand for money is a function of the level of income alone, and change in the rate of interest have no effect on the demand for money on account of these two motives. This component of the demand function for money is denoted as : $M_1 = L_1$ (Y).

The Keynesian innovation in the theory of demand for money is the introduction of the asset demand for money which a sensitive to changes in the rate of interest. This component of the demand for money is a decreasing function of the rate of interest and is usually written as $M_2 = L_1$ (i). Hence the Keynesian demand function for money is : m = $\frac{M}{P} = L_1 (Y) + L_2 (i)$. As already noted L_1 (Y) = XPY. Therefore it can also be written as : m = $\frac{M}{P} = KY + L_2 (i)$, where m is real balances : M is nominal or cash balances : P is the price level ; and K is the Marshallian proportionality constant : Y is real income : and L_2 (i) is the speculative or asset demand for money varying inversely with the rate of interest.

A special feature of the Keynesian version of the theory of demand for money is the hypothesis of the 'liquidity trap', according to which there is some critical minimum rate of interest at which the demand for 'money becomes infinitely elastic. In Fig. 11.1 KY + L_2 (i) is the demand function for money. i_1 is the critical minimum rate of interest. at which the demand for money becomes infinitely elastic, which is indicated by the fact that at i_1. in Fig. 11.1, the demand function for money becomes horizontal. According to the Liquidity Trap Hypothesis, no increase in the supply of money can bring the rate of interest down below i_1, because what ever be the increase in the supply of money, the whole of it will be "trapped" into liquidity and no part of it will be spent on the purchase of income yielding assets. Hence the asset prices will not change and the rate of interest also will not change. When the supply of money is M_1, the demand for money and supply of money are equated at 1_1 rate of interest. When the supply of money is increased to M_2, the demand for and the supply of money are still equated at the i_1 rate of interest.

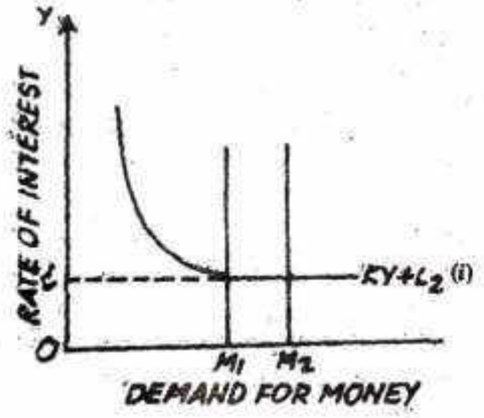


Fig. 11.1

The implication of the Keynesian theory of demand for money is that the monetary policy may not prove to be as effective remedy for curing situations of under employment, because no amount of increase in the quantity of money can lower the rate of interest below a certain minimum. If the full-employment level of investment requires a rate of interest less than this critically minimum rate, this amount of investment will not be forthcoming and, hence, full employment will not be brought about through a monetary policy. That is why Keynes emphasised fiscal measures, especially on the expenditure side, to bring about full employment.

Self Check Exercise-2

Q1. What do you know about the Keynesian theory of demand for money?

11.5 Post-Keynesian Developments (Baumol-Tobin Approach):

Keynesian theory has been discovered to be incomplete in many respects. Therefore a number of efforts have recently been made to fill up the gaps in this theory and to carry it forward. It has been repeatedly pointed out that the Keynesian analysis of liquidity preference or demand for money was made on the assumption of a constant wage-price level therefore it did not explore the implications of changes in price level. Painkin has done well to remind us that the demand for money is, in fact, the demand for real balances; therefore, the demand for nominal money balances varies directly with the change in price level.

An important Post-Keynesian development in the theory of demand for money has been the demonstration: by Baumol (cf. his "The Transaction Demand for Cash: An Inventory Theoretic Approach") and Tobin (cf. his "The Interest Elasticity of the Transaction Demand for Cash") that contary to classical as well as Keynesian assumptions, the demand for money in interest elastic and it varies inversely with the rate of interest. We shall here reproduce briefly the argument behind this proposition.

In a modern economy, where an organised bond market exists, the transaction demand for money is a function of the level of income as well as the rate of interest. The reason is that, in such an economy, it is always possible to sell bonds to realise money. Take the case of an individual who receives an income of Y rupees at the beginning of the period and spends, at a-uniform rate, the whole of it by the end of the period. You will find, that, of the Y rupees received by our individual at the beginning of the period, 3/4 of it will be idle for one fourth of the period; 1/2 of it will be idle for one-half of the period 1/4 of it will be idle for three-fourth of the period. When the facilities of an organised bond market are available a rational individual will use a fraction of his idle funds in buying income yielding assets which would be sold as the demand for cash arises.

How much money he will devote to the purchasing of assets depends on the number of times he contemplates to enter the bond market, For example, if he is contemplating to enter once as a buyer and only once as a seller in the bond market during the given income period, he will maximise his interest earnings if he devotes one half of his income to the purchase of bonds at the beginning of the period and sells these bonds at the end of the half of the period when the need for cash arises. Thus, when two transactions in the bond market are contemplated, as in the above example, one-half of the income (Y) is kept in the form of cash balances and the other half is invested in assets. Now, let us suppose that our hypothetical individual is contemplating three transactions during the given income period : one purchase and two sales. In this case his interest camings will be optimised, if he devotes two thirds of his income at the buchase ofs bond holdings at the end of the one-third of the income period and sells the other half at the end of the two-thirds of the period. From this it follows that, if n transactions are contem- plated (one purchase and (n-1) sales), an individual, who wants to optimise his in $\frac{(n-1)}{n}$ amount to the purchase of bonds at the beginning of the period. But, at the end of the period, he will be left with zero values of bonds, as he will go on converting bonds into money as the need arises. Therefore, his average bond holdings will have the value $\frac{(n-1)}{2n}Y$, and his total interest earnings will be $\frac{(n-1)}{2n}iY$, where *i* is the rate of interest.

The revenue function R increases with the number of transactions (*n*) as shown in Fig. 11.2. But the increase in R takes place at a diminishing rate. When *n* becomes infinite, the limit reached by R is $\frac{iY}{2}$ This maximum revenue will be available if the individual uses his entire income for purchasing bonds at the beginning of the income period and, then, sells his bonds in infinitely small amounts as the demand for cash arises. Obviously in this case the period starts with bond holdriod ends with zero value of bond holdings so that the average bond holdings will have the value $\frac{Y}{2}$ With the rate of interest i, the total revenue from interest will be $\frac{iY}{2}$.

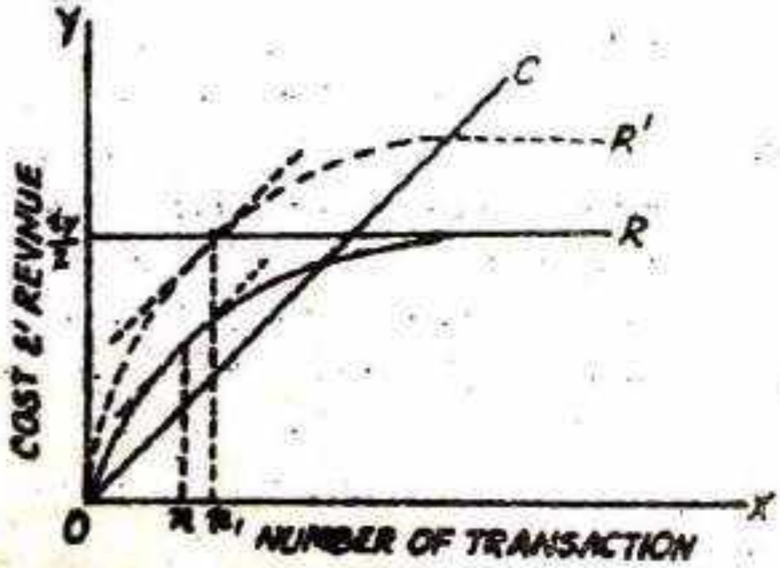


Fig. 11.2

However, the above does not imply that the rational optimising individual will have an infinitely large number of transaxtions and sell his bond holdings continuouses so that his tion demand for money is zero. This could happen only if there had been no costs involved in carrying out transactions in the bond market. But, in fact, such transactions involve costs, a part of which is variable action, while the other is fixed. The fixed component of the cost is intion, It is this fixed component of cost which makes small transactions rather uneconomical and thus places a limit on the number of transactions, On the simplifying assumption that there are only fixed costs, the costs of transactions will increase in proportion with the number of transactions as shown by the straight line C passing through the origin in Fig. 11.2 The vertical distance between R and C functions at any number of transactions gives the net interest earnings at that number of transactions. We know it from the techinique of marginal analysis that such a vertical distance is maximum at the point, where the slopes of the two functions are the same, for, there the marginal revenue condition is satisfied in Fig. 11.2 at n number of transactions. So n is the optimum number of transactions which, under the conditions depicted in Fig. 2, a rational individual will bargain for.

Now, if there is a rise in the rate of interest, the revenue function R will rotate upwards at the origin O to a position like R in Fig. 11.2. This will increase the optimum number of transactions to n_1 implies that with 2 rise in the rate of interest, the average bond holding rise and the average cash holdings decrease. Thus, it is demonstrated that the transaction demand for money is not independent of the rate of interest, but is inversely related with the rate of interest. This obviously contradicts the classical as well as the Keynesian assumption.

Whatever is said above in regard to transactions demand for money as such is applicable to precautinary demand for money as well.

In view of the above argument, it is meaningless to distinguish between the transaction demand for money and the asset demand for money may, therefore be written straightly as : M=L (Y, i).

Keynes's analysis of the speculative demand for money has also been modified in recent times. Keynes's analysis of it has been criticised on the ground that it implies an all-or-none type of behaviour. If the yield from bonds in an excess of the expected capital loss, it will pay one to invest all his funds in bonds. On the other hand, if the yield from bonds is expected to be less than the expected capital loss, one will profit from keeping one's funds in liquid from and holding no bonds at all. This argument suggests that as soon as the critical point, where the expected income from bond holding is greater than the expected capital loss, is reached, there would be a mass exodus from cash into bonds, Similarly, if such a critical point, in the form of a very low rate of intere reached such that the scales are tipped against bonds, would be a mass exodus from bonds into cash.

Keynes had ruled out the above type of behaviour on the assumption that different people have different expectations with regard to the future. But the critics point out that if the low rate of interest, for example, persists long enough, it will begin to be viewed as permanent so that expectations will converage; the fear of capital loss will disappear; and the speculative demand for money will fade out.

The Keynesian analysis was also subject to the charge that it is assumed that the only alternative to keeping assets in the form of cash holdings was to keep them in the form of bonds.

The modern theory of the demand form money as developed by J. Tobin in his "Liquidity Preference as Behaviour Towards Risk" liberates the concept of the speculative or asset demand for money from the reliance on the expectation that the interest rates will rise inthis concept from the assumption that the only alternative to holding assets in the form of cash is to hold bonds. This post-Keynesian development has come to be known as the Porfolio Balance Theory.

Self Check Exercise-3

Q1. Discuss Post Keynesian developments.

11.6 Portfolio Balance Approach:

Tobin's Portfolio Balance Theory assumes a number of assets which are alternatives to cash holdings as well as to one another. These assets can be arranged in order of the degree of liquidity, possessed by each one of them. Perfect liquidity may be defined as the capacity of an asset to be converted immediately into cash without any loss of value. This perfect liquidity is pssessed only by money, But there are other assets, such as equities, time deposts, bills, bonds and real goods, which can also be converted into cash, though not immediately and without any loss of value. Therefore, those alternative assets also possess a certain degree of liquidity. If we have to arrange them in a decending order of the degree of liquidity, the order will be some what like this: money, time deposits, bills, bonds, equities and real goods, Tobin argues that even if no future change in yield or asset prices is expected, the wealth holders cannot be certain about the future. The extent of this uncertainty with regard to future yield varies with the nature of the asset and tends to tun in the same direction as th. In other words, the higher is the expected yield; the greater is the uncertainty about it. The expected returns from equities of an oil exploring company may be very high; but the probability that this expected return will, in fact, be realised is rather very low. The expeceted return on cash, on the other hand, is zero, but there is no uncertainty above it.

A wealth holder, whose preference function is such that he suffers no disutility from uncertainty would rather plunge for assets with high, though uncertain, returns (for the equities of an oil exploring company, for example). Such persons are "plungers". But such persons are few and exceptional. Most people do have a distaste for undertainty and the risk associated with it. They are "risk averters". The risk averters arrange their portfolios in such a way as to balance, at the margin, the utility of additional return against the disutility of additional uncertainty. Such asset holders tend to diversify their portfolio. They will hold some equities with high but uncertain yields some time deposits, some bills and some bonds whose yields are relatively low but certain. They will also hold some cash which does not yield any financial return but is valuable for its perfect liquidity, which permits the cash holders to convert it into any type of assets of any time.

Let us now see what will happen, if there is 2 general rise in yields of assets. The rise in the rate of interest will increase the opportunity-cost of holding cash. On the other hand, the general rise in asset yields will go some way to overcome the investors' risk- aversion, Consequently the investors will substitute some equities with high but uncertain yields in place of long-term bonds, some long-term bonds in place of bills and some bills in place of cash. This implies that the composition of the investors portfolios will change in the direction of less liquidity. The investors preference for liquidity can, therefore, be regarded to decrease with a rise in the rate of interest. On the other hand, a fall in the rate of interest lowers the opportunity cost of holding cash and, when there is a general fall in yields, the assets like equities giving high but uncertain return becomes less attractive. The mass of investors who are "risk averters" rather than "plungers" will rearrange their portfolios in the direction of greater liquidity, substituting cash in place of bills, some bills in place of long- term bonds and some long term bonds in place of equities. From this it is concluded that liquidity preference of the demand for money is an inverse function of the rate of interest.

It should be noted that the above conclusion is not quite different from the Keynesian conclusion. Only the explanation is somewhat different.

Self Check Exercise-4

Q1. What do you know about Port folio balance approach?

11.7 The Liquidity Trap Hypothesis:

Another post-Keynesian development in the theory of demand for money has been that the Liquidity Trap Hypothesis of Keynes has come under doubt. In this context we may mention the empirical verification of this hypothesis by Bronfenbrenner and Mayer, who have come to the conclusion that "There is no evidence for the proposition that interest elasticity of demand for either speculative cash balances or for total cash balances goes to zero to high rates of interest or for the proposition that some "floor" or "bottom stop" exists for interest rates at which elasticity goes to infinity (cf..their paper, Liquidity Functions in the American Economy" Econometrica, Oct. 1960).

There are essentially three theoretical reasons why interest of demand for money may be greater at low interest rates than high ones. First, if people hold some idea of a 'normal' interest rate, as it is implied in the Keynesian analysis, then the lower is the interest rate at any given time, the greater is the chance that it will rise again and the greater is the amount by which it can be expected to rise again. Second, if the rate of interest is already low, it cannot fall much further, and hence potential capital loss from holdings of bonds is greater at a low rate of interest than at a high rate of interest. Third, as the interest rate opproaches the cost of dealing in bonds, the demand for money must become infinitely elastic.

All the above arguments are open to criticism. The first argument is open to the criticism that a decline in interest rate may lead to expectations of subsequent further declines. What is relevant here is not the long-term rate but rather the short-term rate. If someone expects the long-term rate to rise in future, he need not keep his assets in the form of cash. He can hold bills instead. And for the short-term rate an expected 'normal' level is less likely to be significant than for the long-term rate. The second argument is open to the objection that potential capital loss at different interest rates seems to relate to the level of demand for money rather than to the elasticity of this demand. The fear of a significant capital loss at low interest rates may make people less willing to hold bonds, but this does not inform us about the elasticity of the demand schedule fo money. Moreover, if we take potential capital gains also into account, the argument does not necessarily hold even for the level of demand for money, not to say of its elasticity. This can be better illustrated in terms of opportunity cost rather than in terms of capital values. Suppose the initial rate of interest is 10%. If it rises by half of itself to 15%, the opportunity loss on Rs. 1000 bond is Rs. 50. but if the rate of interest falls by half to 5%, the opportunity gain is also Rs. 50 similarly, if the rate of interest is 1% initially, a 50% rise in the rate of interest will cause a loss which is equal to the gain caused by a 50% fall in the rate of interest from the initial rate of 1%. The critical assumption here is that interest rate changes by a given percent of itself rather than by an absolute amount as it is assumed in the Keynesian analysis. Given this critical assumption, high and low interest rates are at par, as far as capital gains or losses are concerned.

The third, argument, which is particularly relevant to the liquidity trap' hypothesis, involves a problem of aggregation. For any one individual, there is a certain cost, both psychic as well as financial, of buying bonds. At an interest rate just equalling this cost, his demand for bonds is zero and, therefore, his demand for money is infinitely elastic. For the society as a whole, however, there is no single cost of investing in bonds. Therefore different individuals will drop out of the bond market at different interest rates. Thus, while for each individual separately the demand for money may become infinitely elastic at certain interest rate, this conclusion does not necessarily follow for a group of people, except in special cases.

The above are the theoretical reasons for casting doubts at the 'liquidity trap' hypothesis. However, the empirical data collected and analysed by Bronfenbrenner and Mayer, in their paper referred to above, also suggest that, during the period covered by this study (1919-56) and over the interest rates covered, the demand schedule for money in the American economy did not, in fact, become more elastic as interest rates fell.

Self Check Exercise-5

Q1. Discuss the Liquidity Trap Hypothesis.

11.8 Wealth Effect and Demand For Money :

Pigou had stated as long ago as in 1917 that the demand for money was a function of, among other things, the interest rate. Keynesian contribution in 1936 through his General Theory was to attempt a grand simplification by focusing attention on only two determinants of the demand for money. These two determinants were rate of interest and income. While this has proved to be a fruitful insight, it was nevertheless, too great a simplification. Much of the subsequent I work on the theory of demand for money has consisted of putting additional variables into the demand function for money. The empirical study made by Bronfenbrenner and Mayer, referred to above, shows that most of the fluctuations in idle cash balances can be accounted for by changes in the stock of wealth and the previous year's idle balances, when all the variables are measured logarithmically. Recent work by other economists like Tobin also emphasises the importance of wealth in determining the demand for money. Tobin's theory of portfolio balance suggests that an increase in the quantity of money demanded occurs not only when income rises and/or the rate of interest falls, but also when the asset holders total wealth increases. Patinkin's analysis in his Money Interest and Prices also suggest the same proposition. Support for this proposition can easily be found in the theory of the rational consumer's behaviour. Wealth effect is like the income effect of the microeconomic theory of consumption. An increase in the wealth of an individual induces him to distribute the increment over all the forms of assets in which he keeps his wealth except in the exceptional case when a particular type of asset is looked upon as 'inferior". Therefore, individuals are believed to demand more money when their total wealth increases. In view of this, the modern variant of the demand function for money may be written as : $m = M/P = (i,Y.K)$, where K represents the capital stock of the society. The capital stock K, is the measure of the productive wealth of the society.

Emphasis on wealth as an important determinant of the demand for money has been carried to the farthest by the modern quantity theorists like Milton Friedman (cf. his "This Quantity Theory of Money: A Restatement"): The modern quantitiy theorists differ from the modern Keynesians in that the former regard the rate of interest and the level of income as of minor importance in determining the demand for money and they assign the key role, in the determination of the demand for money, to wealth.

Self Check Exercise-6

Q1. Discuss the Wealth effect and Demand for Money.

11.9 Friedman's Contribution :

Friedman's contribution to the theory of demand for money is to be found in his Restatement of the Quantity Theory of money wherein he asserts that the Quantity Theory of Money is neither a theory of the price level nor a theory of the income level but it is "in the first instance a theory of the demand for money."

Friedman's approach to the analysis of the demand for money can be described variously. It is a type of portfolio balance approach, the seeds of which could be found even in the Keynesian theory of the demand for money. It also represents an asset approach to the analysis of the demand for money.

In his famous paper. "The Quantity Theory of Money: A Restatement". Friedman argues that money is only one of the froms in which the wealth-owning units keep their wealth. Thus the basic contribution of Friedman to the theory of demand for money is to treat it as an asset form in which along with other forms of assets the wealth-holders keep their wealth. All these assets in the forms of which the wealth-holders keep their wealth make up their portfolio of assets. Friedman assumes that the wealth-holders tend to distribute their total wealth among the alternative asset forms in such 2 manner as to maximise their utility function. The portfolio of assets of a given wealth-owning unit is perceived to be in balance when its total wealth is distributed among the various asset forms in such a manner that its total rutility is maximised.

For the purposes of analysis Friedman considers only five alternative forms of assets, namely, money (M), bonds (B), equities (E), physical non-human goods (G) and human capital (H). Each form of asset is seen to be yielding a certain rate of return so that these rates of return can be compared. Thus he analyses the demand for money in terms of the micro-economic theory of consumer demand and arrives at the following demand function for money:-

(1) $M= f\left(P, rb, r_e, \frac{I}{P}\frac{DP}{dt} W. Y. \mu\right)$

where M is the demand for money: P is the price level, r_b is the bond rate of interest; r_c is the equity rate of interest ; P is the price level ; W is total wealth ; Y is money income; in the rate of change in the price level, and U represnts the individual's tastes or preferences.

Friedman's money demand function has the following special attributes. Firstly, like all types of demand analysis based the assumption of on utility-maximising behaviour of people and absence of "money illusion" and, therefore, expressed in real magnitudes, this function too remains unaffected by any change in the monetary unit as regard the real magnitudes. This implies that the demand for real balances $\left(\frac{M}{P}\right)$ remains unaffected by a change in the monetary unit. In other words, the theory implies that the demand for nominal balances (M) will change in the same proportion and in the same direction as the monetary unit changes. This means that Friedman's demand function for money in homognous of the first degree in money prices and money income.

The above nature of the demand function for money allows us to rewrite the above demand function of equation (1) as follows :

(2) λ M = 1 (λ P.r b, r_e, $\frac{I}{P}$ $\frac{dP}{dt}$, W, λ Y, μ)

Putting = λ = I/P we get :

(3) M/P = f (r_n, r_e, $\frac{I}{P}$ $\frac{dP}{dt}$ W. $\frac{Y}{P}$. μ)

which is Friedman's demand function for real balances.

If we put λ = 1/Y in equation (2) above, we get :

(4) M/Y = f (r_n, r_e, $M = \frac{1}{V\left(rb, re, \frac{1}{P}, \frac{dP}{dt}, \frac{P}{Y}, W, \mu\right)} Y$, $\frac{Y}{P}$, μ)

Rearranging (4) we can get :

(5) M = f (r_n, r_e, $\frac{I}{P}$ $\frac{dP}{dt}$, $\frac{P}{Y}$, μ)

which is equivalent to the Cambridge money demand function :

(6) M = kPY

However, Y in (6) is real income while Y in (5) is money income.

Therefore, PY of (6) equals Y of (5) K of (6) corresponds to f $\left(rb, re, \frac{I}{P}, \frac{dP}{dt}, \frac{P}{Y}, W, \mu\right)$ Since k is the reciprocal of the velocity of circulation of money (v). The Friedman's demand function for money for equation (5) can also be written as follows :

(7) $$M = \frac{1}{V\left(rb, re, \frac{1}{P}, \frac{dP}{dt}, \frac{P}{Y}, W, \mu\right)} Y$$

which is equivalent to the Fisherian money demand function.

Thus Friedman's money demand function looks similar to the traditional quantity theory of money. But this similarity is only superficial. The fundamental difference between the two is that while the traditional referes to mere velocity of money, v, or its reciprocal, k, Friedman's Restatement of it referes to the velocity function Moreover, Friedman's Restatement implies that it is only the velocity function, $V\left(rb, re, \frac{1}{P}, \frac{dP}{dt}, \frac{P}{Y}, W, \mu\right)$ Which remains stable; the velocity of money, v, as such can fluctuate, But in the traditional forms of the Quantity Theory of Money the velocity of money (v) or its reciprocal k is assumed to be constant.

Self Check Exercise-7

Q1. What is Friedman's contribution to the theory of demand for money?

11.10 Summary

The post Keynesian debate on money demand has led to much convergence of thought on many vital points such as positive relation between money demand and income, a negative relation between money demand and changes in interest rate, a relatively greater interest elasticity of money demand function in the long run and lesser interest elasticity in the short run and proportionality between nominal balances and price level or absence of money illusion. The empirical studies have not fully confined the existence of liquidity trap. There has been however, greater empirical support for stability of money demand function. A greater empirical research is still required about the effects of innovations in the financial sector, uncertainty of transaction flows and the demand for money by business.

11.11 Glossary

The demand for money arises from two important functions of money. The first is that money acts as a medium of exchange and the second is that it is a store of value. Thus individuals and businesses wise to hold money partly in cash and partly in the form of assets.

What explains changes in the demand for money? There are two views on this issue. The first is the scale view which is related to the impact of the money or wealth level upon the demand for money. The demand for money is directly related to the income level. The higher the income level, the greater will be the demand for money. The second is the substitution view which is related to relative attractiveness of assets that can be substituted for money. According to this view when alternative assets like bonds become unattractive due to fall in interest rates, people prefer to keep their assets in cash, and the demand for money increases and vice versa.

11.12 Answers to self check exercise

Self Check exercise -1

Ans.1. Refer to Section 11.3

Self Check exercise -2

Ans.1. Refer to Section 11.4

Self Check exercise -3

Ans.1. Refer to Section 11.5

Self Check exercise -4

Ans.1. Refer to Section 11.6

Self Check exercise -5

Ans.1. Refer to Section 11.7

Self Check exercise -6

Ans.1. Refer to Section 11.8

Self Check exercise -7

Ans.1. Refer to Section 11.9

11.13 References/ SUGGESTED READINGS

1. Demberg and Mc Dougal. Macroeconomics Ch. 8.
2. J. Tobin. "A Dynamic Aggregative Model."Journal of Political Economy, Vol. 63, pp. 103-115.
3. J. Tobin. "Liquidity Preference as Behaviour Towards Risk." in Review of Economics and Statistics, Feb. 1958.
4. Bronfenbrenner and Mayer. "Liquidity Functions in the American Economy." Econometrica, Oct. 1960.
5. M. Friedman, "The Quantity Theory of Money: A Restatement." in Studies in the Quantity Theory of Money Ch. 1.
6. W. H. Branson. Macroeconomic Theory and Policy. Ch. 12.

11.14 Terminal Questions

Q.1 Explain the classical theory of demand for money bringing out its implications.

Q.2 Explain the Liquidity preference theory of demand for money. Also explain the Liquidity Trap.

Q.3 According to Friedman the Quantity theory of Money is a theory of neither the price level nor the income level but it is a theory of demand for money. Explain this statement.

*****

Unit - 12

SUPPLY OF MONEY AND MONETARY EQUILIBRIUM

STRUCTURE

12.1 INTRODUCTION

Before we take up the analysis of the supply of money, it is proper as well as useful to be first clear about the very meaning of the concept of money. As a matter of fact there are different concepts of money. A layman generally understands by money currency notes and coins only. But, that is not the exact or adequate meaning of money as this concept is used in the science of economics. Money, it is often said, is what money does which means that anything which performs the functions of money is money. But, what are these functions of money? These functions as embodied beautifully in the popular rhyme are: "Money is a matter of functions four/A medium, a measure, a standard and a store." The rhyme conveys the information that money is called upon to perform basically four functions, namely to act as a medium of exchange, to act as a common measure of value of exchangeable goods, to act as a standard for deferred payments involved in credit transactions, and to act as a store of value or wealth, and that anything that performs these functions is money. However, the most basic function of money in the real world econmies is to act as a common medium of exchange. Anything which performs this function is most likely to perform the other three functions also. That is why Crowther defined money as "anything that is generally acceptable as a means of exchange (i.e. as a means of setting debts) and that at the same time acts as a measure and a store of value."

12.2 Learning Objectives

After going through this chapter you will be able:

- To understand the concept of money
- To know the meaning of money supply and its determination
- To understand the process of deposit creation and money supply
- To understand the Instruments of control of money supply
- To understand the Equilibrium in the money market

12.3 Concepts of money

The conventional approach to defining the concept of money emphasises the function of money as the circulating medium of exchange. This approach considers the function of money as a medium of exchange or a generally accepted means of payment to be its unique and most important function. Following this line of approach money is interpreted to mean currency notes and enins and also the demand deposits of the banks which can be freely withdrawn for spending by drawing cheques on the banks. These cheques on banks are generally accepted as a means of payment and discharging debts in modern economies. Therefore, they are at par with currency notes and coins. They (demand deposits) also serve as a method of storing value or wealth.

However, money in the sense of currency note coins and demand deposits of the banks is usually referred to as narrow money and in modem economic literature is referred to as M_1 It is described as narrow money this concept of money is based upon a narrow or restrictive definition of money.

As alternative concept of money is the concept of broad money put in vogue mainly by the economists of the Chicago School led by Milton Friedman. The concept of broad money includes under the term of "money" not only currency notes, coins and demand deposits of the banks but also the time or term or fixed deposits of the banks. This concept is based on a broader definition of money and is referred to as M. The argument of the Chicago School for including under money time deposits also is that they are almost perfect substitute of demand deposits which, in turn, as perfect substitute of currency notes and coins. They further argue that it is but proper that all such items which are perfect substitutes of one another should be treated as one single item. It is true, they say, that time deposits are not freely with drawable but they can usually be converted into demand deposits by fulfilling certain conditions. Therefore, they hold money should be broadly defined to include time deposits also. But perhaps a stronger and more cogent reason for them to define money broadly as above is that this definition of money has helped them in their studies to establish a better correlation between changes in the supply of money and changes in the national money income.

Still another concept of money which goes even further than the Chicago School concept explained above in broadening the definition of money has been put forth by John G. Gurley and Edward S. Shaw. They argue that currency and banks' demand and time deposits are only a few among the many claims against financial intermediaries which they classify into banks and non bank financial intermediaries like mutual funds saving funds and investment societies. All types of money, they argue, represent a sort of debt. Currency money is the non-interest bearing debt of the government demand and time deposits are the debt of or claims against the banks. But there are similar claims against or debt of non-bank financial intermediaries also in the form of post office saving deposits, deposits with mutual saving and investment societies or in the form of debentures or bonds and equities issued by non-bank financial institutions. They argue that these different types of claims against non-bank financial intermediaries are very close substitutes of claims against banks in the form of their demand and time deposits. Therefore, according to them, we should include under the term, "money", not only currency and bank's demand and time deposits but also the deposits with, that is, the claims of the public against the non-bank financial intermediaries as well. Since this definition focuses on the liquidity level of an economy, this is generally described as the liquidity definition of money.

There is still another concept of money which is known as the Central bank concept. Since the purpose for which a central bank generally needs an appropriate concept of money is the purpose of controlling the money supply, therefore, the concept of money generally used by central banks is the one which includes currency and bank's demand deposits as well as such credit funds which it can possibly try to control. In fact the detailed concept of money used by central banks is likely to vary from country to country and from time to time in even one and the same country.

Self Check Exercise-1

Q1. Discuss concept of money.

12.4 Money Supply : Its Meaning

When we speak of money supply, it may refer to the total sum of money in any one of the four senses explained above. Therefore, it is important to identify the particular concept used in a particular study of discussion wherein the term, "supply of money" is used. In the standard theory textbook the term, "supply of money" is usually employed in the conventional sense of narrow money which includes banks' demand deposits along with currency and coins but excludes the time deposits. There are two important reasons for using this concept of money (M_1). Firstly, time deposits, though they may be convertible into demand deposits, cannot be done so without certain conditions and fulfilling these conditions will certainly involve some time, inconvenience and even some cash. Moreover, while time deposits earn interest demand deposits do not. In view of it time deposits cannot be perfect substitute of demand deposits, however a close substitutes one may regard them to be. Moreover, in the textbook theories supply of money is generally analysed in the context of monetary policy which the central bank of a country would like to adopt. In this context, focus has to be put only on those components which the central bank can possibly influence by choosing and operating a suitable policy. From this point of view as well as from the point of view of sleeping the test book explanation and analysis at a reasonably simple level and avoiding needless complications, it is the conventional meaning of the supply of money as M_1 in which this term is employed. We shall be using this term in this sense only in the discussion to follow hereunder.

It will be useful to mention here another classification of the concept of money supply. Money supply may refer to either a stock of money or a flow of money. Stock of money refers to the total amount of money at any given point of time. Flow of money, on the other hand, refers to a flow such as money income or money expenditure which is measured per unit of time, that is, like of money income or money expenditure per week or per month or per year, etc. If, for example, we consider the well-known equation of exchange (MV=PT). M in it refers to stock of money while MV and PT refers to flows of money.

Self Check Exercise-2

Q1. What is the meaning of supply of money?

12.5 Determination of Money Supply

An important issue in the theory of money is whether the supply of money is determined exogenously or endogenously or in both ways. It is important to know it, for if it is completely exogenously determined, as it is usually suggested in common textbooks and particularly in the Keynesian Liquidity Preference Theory of the rate of interest, then it is independent of rate of interest and is completely under the control and discretion of the central monetary authority of a country. On the other hand, if it is completely endogenously determined, the central monetary authority may not be able to control it and it may be determined solely by the market forces as reflected in the market rate or rates of interest. As we shall soon know, the supply of money in a modern economy is partly determined endogenously and partly exogenously by the central monetary authority that is the central bank of a country.

The sense in which we are going to use the term money, supply, is the "narrow money" sense (M_1) which, as we have seen includes currency (coins plus paper .urrency) and demand deposits of the banks. Coins are generally issued by the government or the treasury on its behalf. Sometime some paper currency (like one-rupee in India) may also be issued by the government (treasury). But these components are generally too insignificant a portion of the total supply of money in an economy at any given time. Therefore we need not pay much attention to it and paper currency may be deemed to be completely determined by the central bank of a country under the limitations imposed by the relevant statues in this regard. The remaining component of money supply, namely, the bank deposits is the most important as well as usually the largest component. Though, as we shall soon see, even this component of money supply is significantly under the control of the central bank of a country, yet in the process of deposit creation the banks themselves as well as the public are also involved. It is due to this that money supply in simple macro models is generally treated to be autonomously or exogenously determined. However, before we go into the details of the determination of money supply it is important to know about the process of creating demand deposits and the instruments of monetary control through which the central bank of a country can exercise control over the process.

12.5.1 Process of Deposit Creation and Money Supply

How are the demand deposits of a bank created ? Whenever a bank lends to a borrower, it does it by creating a deposit, in its book, in his account which the borrower can draw upon by drawing a cheque on the bank as the need for payment arises. This means that a bank must have some cash always with it to meet this need. This requires a bank to keep a certain proportion of its deposits as cash reserve so as not to default on demands for payment. In principle the safe proportion of the total deposits that must be kept as reserve may be determined by the managemer of the bank itself on the basis of its experience. But in modern times it is almost always and everywhere determined by the central bank of the country concerned. Let us suppose that this cash-reserve ratio is fixed at 20 percent. Now, if a bank receives from the public a deposit of, say, Rs. 10,000, it will keep 20 percent of it, that is, Rs.2000 in its cash reserves and the rest of it, that is, Rs. 8000 will be lent out at interest by creating deposits worth Rs. 8000. But these deposits will be used by the borrowers by drawing cheques on it and making their payments with these cheques. Supposing these cheques worth Rs. 8000 are deposited by, recipients of these cheques in the same bank or some other bank, then in the next round 20 percent of Rs. 8000, that is. Rs. 1600, will be retained in cash reserves and the remainder, that is, Rs. 6400 will be lent out by creating fresh deposits amounting to Rs. 6400. This process of deposit creation will go on till the banks are fully loaned up and are in equilibrium. The successive rounds of deposit creation will take the following form :

ΔM = Rs 10000 + 8000 + 6400 + ...

= Rs 10000 [1 + 0.8 + $(0.8)^2$ + (0.8) 3+.............]

= Rs. 10000 x $\frac{1}{1-0.8}$

$$= \text{Rs. } 10000 \times \frac{1}{0.2} = \text{Rs } 50000$$

The above analysis implies that a given increase in the cash reserves of bank will lead to a multiple time increase in its deposits and therefore in the supply of money. This multiple is described as the bank-deposit multiplier. The bank demand deposit multiplier or money multiplier as it is often referred to is in our example $\frac{1}{0.2} = 5$ which is the reciprocal of the required cash reserve ratio (20%, i.e.

$$(20\% \; i.e. \frac{20}{100} = \frac{1}{5})$$

The above simple analysis of the process of deposit creation brings out two important factors determining the money supply. These two factors are (1) change in the cash reserves of the banks, and (2) the required cash reserve ratio. The higher are the actual cash reserves of the banks, the greater will be supply of bank For example, if the cash reserves of the bank in our example had increased by Rs. 20,000 instead of Rs. 10,000 the required cash reserve ratio remaining the same at 20%, then the total increase in the supply of money, all other things remaining the same, would have been Rs. 1,00,000 instead of Rs. 50.000. On the other hand, the lower is the required cash reserve ratio, the greater will be the increase in the bank deposits consequent upon any given increase in its cash reserves. In our above example, if the reserves increased by Rs. 10.000 but the required cash reserve ratio had been 10% instead of then the total increase in money supply all other things remaining the same, would have been Rs. 10000 x $\frac{1}{0.1}$ (= Rs. 1.00.000) instead of Rs. 50,000.

This brings us to the role that the central bank of a country plays in determining the money supply. The above analysis implies that the central bank can influence the supply of money by either influencing the level of cash reserves of the member banks or by changing the required cash reserve ratio of the member banks. For this purpose it generally has certain instruments of control authorised to it by the law of the country concerned. We explain these instruments of monetary control in the following section.

12.5.2 The Instruments of Control of Money Supply

Its main instruments of monetary control through which the central bank of a country influences the cash reserves and the required cash reserve ratio of the banks and by doing so influences the determination of money supply are : (1) open market operations, (2) discount rate or the bank rate, and (3) variation in cash reserves requirements.

If the central bank wants to increase the total money supply, it can use any one or any combination of the above instruments of monetary control. For example, it may use the open market operations policy and purchase securities in the open market for which it makes payments by drawing cheques on itself. These cheques will be deposited in the banks and they will increase their cash reserves on the basis of which more bank money will be created. The central bank will sell securities in the open market, if the objective is to reduce the money supply. The buyers of securities will pay to the central bank by cheques on their banks. The central bank will demand cash payment against these cheques which will decrease the cash reserves of the member banks who will thus be obliged to reduce their deposits to bring their total deposits in alignment with the given required cash reserve ratio. This shows that the central bank can influence the supply of money on its own initiative and thus the money supply would seem to be exogenously determined.

The other method for the central bank to control money supply is to change the minimum cash reserve requirements of the member banks. The central bank of a country is legally expowered to do so. Thus when it desires to increase the money supply it will lower the minimum required cash reserve ratio. On the other hand, when it desires to decrease the money supply, it will raise this minimum cash reserve requirement. This will also suggest that money supply is exogenously determined by the central bank of a country.

However, one of the important functions of the central bank is to act as the lender of the last resort which function it performs by advancing loans to member banks through rediscounting bills of exchange. When the member bank find their cash reserves to be inadequate, they can approach the central bank for accommodation and get their bills rediscounted. This would suggest that the banks too can exercise some initiative in changing the supply of money. The banks will usually do so if public demand for loans is high and the public is willing to pay a higher rate of interest. Attracted by this higher rate of interest, the member banks may seek to increase their reserves by borrowing from the central bank and thus increasing their loans and deposits and consequently the supply of money. This suggest that supply of money is not wholly autonomous of the rate of interest as is generally assumed in the Keynesian liquidity preference theory. This means that the supply of money curve need not be vertical throughout but may be upward sloping to the right at least beyond a certain point. However, it should be noted that the central bank can thwart such efforts by the banks to a certain extent by raising the discount rate (Bank Rate) that it charges to the banks.

12.5.3 Money Supply and the Government

Money supply may also be affected by the budget any operations of the government. If the government is running deficit budgets and the deficit is not met by public borrowing but is met by borrowing from the central bank, it will also increase the money supply. The demand of the government may be met by the central bank by a fresh issue of paper currency which will ultimately find its way into the cash reserves of the banks on the basis of which there will be increase in bank deposits also. Thus deficit financing by the government increases the money supply more than the amount of deficit financing.

Self Check Exercise-3

Q1. Discuss the process of deposit creation and money supply.

Q2. Discuss about various instruments of control of money supply.

12.6 A Simple Money Supply Model

Friedman and Schwartz has referred to three basic factors which determine the supply of money. One of these is what they describe as the high-powered money which consists of the currency plus the deposits of the commercial banks with the central bank. Both these components are the liabilities of the central bank. It is this high-powered money which in the model of Friedman and Schwartz which ultimately determines the superstructure of money supply in an economy. That is why this money has come to be known as the high- powered money or the monetary base. The other two factors that determine the money supply in this model are two ratios: (a) the minimum required cash reserve ratio of the banks, and (b) the currency/deposit ratio in which the public prefers to hold its assets (wealth).

Let us denote high-powered money with the sym- bol H and let r and c represent respectively the minimum cash reserve/deposit ratio of the commercial banks and the preferred currency/deposit ratio of the public. Our simple money supply model can be represented as follows:

(1) M = C + D

where M stands for money supply, C for currency and D for demand deposits

(2) H = C + R

where H is high-powered money and R is bank's reserves with the central bank.

Dividing equation (1) by equation (2) :

(3) $$\frac{M}{H} = \frac{C+D}{C+R}$$

Dividing both the numerator and the denominator of the right-hand term of equation (3) by D

(4) $$\frac{M}{H} = \frac{C/D+1}{C/D+R/D}$$

or (5) $$\frac{M}{H} = \frac{c+1}{c+r}$$

Or (6) M = H $$\frac{M}{H} = \left[\frac{1+c}{c+r}\right]$$

The equation (6) above indicates that H. c and r one the three proximate determinants of the supply of money; that is, it is ultimately high-powered money (H), the ratio between currency and bank deposits in which the public prefers to keep its assets or wealth (c) and the minimum cash reserves requirements of the banks (r) which determine the supply of money.

Since, of these three factors, two (H and r) can be controlled by the central bank, the money supply may be said to be determined exogenously. But we have also seen that the banks cash reserves components of high- powered money can also oe influenced to some extent by the initiative of the banks in response to a rise in the market rate of interest. Moreover, a change in the rate of interest will influence e, the ratio between currency and deposits in which the public prefers to keep its assets and through it will influence the money supply. This also implies that supply of money is not perfectly exogenous.

Self Check Exercise-4

Q1. What do you know about a simple Money Supply Model?

12.7 Teigen's Money Supply Model

A little more complicated money supply model based on Teigen work."The Demand for and Supply of Money," is presented below.

The money supply is currency held by the public (C_P) plus demand deposits held by the public in the banking system (D_P). Thus

(1) $M = C_P + D_P$

Let us suppose that the public holds h percent of its money in the form of currency and the rest of it (1- h) in the form of demand deposits with the banks so that

(2) $C_P = h\ M$

and (3) $D_P = (1\text{-}h)\ M$

Let r be the required reserve ratio of the banks and RR be the required reserves so that

(4) $RR = r.\ D_P = r\ (1\text{-}h)\ M$

Now, we know that the cash reserves of the banks may be partly borrowed from the central bank and partly unborrowed when the central bank replenishes these resources by purchasing securities in the open market. Thus the total bank reserves (R) will be equal to the sum of the bank's unborrowed resources (RU) and their borrowed reserves (RB). The total reserves of the banks (R) are employed to satisfy the ininimum cash requirement (RR). Some of the reserves supplied by central bank through open market operations will get into the hands of the public in the form of currency (C) and the remaining reserves will be excess reserves (RE). Therefore

(5) $RU + RB \equiv R \equiv RR + RE + C_P$

The above reserves identity (5) also provides us an expression for the policy instrument that the central bank directly controls through open market operations. That is.

(6) $RU = RR + RE — RB + C_P = RR + RF + C_P$

where (RF) denotes net free reserves defined as RE—RB. Free net reserves (RF) are sensitive to changes in the rate of interest as we shall see shortly. From equation (2), (4) and (6) we can get the following equation (7) :

(7) $RU = r\ (1—h)\ M + RF + hM$

Solving equation (7) above for M gives us the money supply equation as follows :

(8) $$M = \frac{RU - RF}{h + r(1-h)} = \frac{RU - RF}{r + h(1-r)}$$

It is apparent from the above equation (8) that $\partial M / \partial RU > 0$ and $\partial M / \partial RF$, $\partial M / \partial r$ and $\partial M / \partial h$ are all negative. This implies that money supply will increase as the central bank provides more unborrowed reserves (RU) and it will decrease as free reserves (RF) increase and/or the public's preference for currency holding (h) rises and /or the 'central bank raises the minimum required cash reserve ratio of the banks (r). The banks, though their decisions on excess reserves and borrowing from the central bank, determine RF, that is, its net free reserves; the central bank determines r directly and RU (unborrowed reserves) by open market operations, and the public's tastes determine the ratio h. All these variables taken together determine the aggregate money supply (M).

The equation (3) above can also be written as follows :

(9) $$M = \frac{RU}{h + r(1-h)} = \frac{RF}{h + r(1-h)}$$

The RU term in the above equation (9) gives the portion of the money supply which is mainly determined exogenously at the' initiative of the central bank. On the other hand, the RF term in (9) gives the portion of the money supply which is mainly endogenously determined by the banking system in response to loan opportunities and interest rates.

Self Check Exercise-5

Q1. What do you know about Teigen's Money Supply Model?

12.8 Equilibrium in the Money Market

Monetary equilibrium or equilibrium in the money market is determined by the forces of demand and sup- ply. Money is deemed to be a commodity just like any other commodity. The equilibrium in the money market is determined when the demand for money equals its supply. There are alternative theories explaining the mechanism through which this monetary equilibrium is brought about. We consider a couple of these below.

12.8.1 (a) Keynes's Theory:

Keynes argued the rate of interest is the price paid for the use of money by the borrowers (or the sellers of debentures or bonds) and charged by the lenders (or the buyers of debentures or bonds). Rate of interest, he seemed to argue, is the price which people would demand to part with their liquidity preference, where liquidity preference is defined as the preference of the people to hold their assets in the form of readily available purchasing power rather than in any other form. Readily available purchasing power is in the form of cash or currency plus the demand deposits in the banks. In other words, liquidity or readily available purchasing power consists in the holdings of narrowly defined money called M_1 Thus, according to this theory equilibrium in the money market is determined by the demand for money and the supply of money. We have already explained in some detail Keynes's analysis of demand for money which, according to him, is determined by the liquidity preference of the people which is accounted for by three motives the transaction motive, the precautionary motive and the speculative motive. Money demanded on account of the first two of these motives is insensitive to changes in the rate of interest. But money demanded on account of the speculative motive is sensitive to changes in the rate of interest. However, money demanded on account of the transaction and precautionary motives depends on the level of income having a direct relationship with it. Money demanded due to the speculative motive is inversely related with it the rate of interest. Thus given the level of income, the liquidity preference curve will be negatively sloping and will become infinitely elastic at some critically minimum rate of interest at which there is said to be a liquidity trap. If income level rises this, curve shifts to the right, and if the income level falls, the curve shifts to the left (see for details Lesson No.11)

The supply of money in Keynes's theory is exogenously determined by the central bank. The 2 equilibrium takes palce at that rate of interest at which the demand for money equals the given supply of money. If this money supply is increased, people will find in their possessions more money than they desire to hold at the existing rate of interest. So they will try to get rid of the excess holdings of money by purchasing bond in the market. The bond prices will rise due to increased demand for them which means that the rate of interest will fall to a level at which the demand for money or liquidity preference is again equal to the new money supply. The reverse will be the effect on the rate of interest of a decreased money supply.

In nutshell, equilibrium in the money market in Keynes's theory comes about through changes in the rate of interest.

12.8.2 Hicks-Hansen's General Equilibrium Theory :

The above theory of monetary equilibrium presented by Keynes was criticised for being indeterminate just like the earlier classical and neoclassical theories, for the exact position of liquidity preference cannot be known unless we know the equilibrium level of income which cannot be known unless we know the equilibrium rate of interest. To remove this difficulty Hicks, in his famous paper, "Mr. Keynes and the Classics: A Suggested Interpretation", published in 1937 and later on Hansen also, combined the Keynesian liquidity preference theory of monetary equilibrium and the neoclassical theory in order to provide a determinate solution of the problem of determining equilibrium in the money market as well as the product market. The merit of their model known as IS-LM model lies in thier demonstration that the equilibrium in both the markets is determined simultaneously in a system of general equilibrium. Thus the model removed the dichotomy in Keynes's model which, according to H.G, Johnson, was split into two parts: a theory of income and employment in which the rate of interest entered exogenously and a theory of money in which the level of income entered exogenously.

We shall be explaining the IS-LM model in detail in the next lesson in the context of Keynesian Dichotionary where it will be shown that monetary equilibrium and real equilibrium are determined together.

12.8.3 The Classical Approach :

In the Keynesian model the monetary equilibrium takes place through changes in the rate of interest which, according to Keynes, is a monetary phenomenon. But in the classical model the monetary equilibrium takes place through changes in the price level.

In the classical model, money is assumed to perform the function of medical of exchange and therefore the demand for money, as we explained in the preceeding lesson on the d. and for money, is made to depend on the level of income, on the one hand, and the level of prices, on the other hand. Moreover, in the classical model, there is assumed to be a unique macroeconomic equilibrium which takes place at the full employment level of income. The classical money demand function has the following form : Where M^d is the demand for money, P is the price level, Y is the full employment level of income which is assumed to be given and constant ; and K is the proptation of Y which the society prefers to keep in the form :

$$M^d = kPY = \frac{1}{v}PY$$

Where M^d is the demand for money, P is the price level. Y is the full employment level of income which is assumed to be given and constant and K is the proptation of Y which the society prefers to keep in the form of money and it is the reciprocal of v which is the velocity of circulation of money which is an institutional constant (and therefore K is also an institutional constant) dependent as it is on the institutional factors as explained earlier in the preceeding lesson (see "Classical Theory of Demand" in this lesson).

If M^d represents money supply, then the condition necessary for equilibrium in the money market is as follows :

$$M^x = M^d = kPY = \frac{1}{v} PY$$

Now if we suppose that the initial supply of money is M_0 and the initial price level at which the demand for money equals this supply of money is P_0 then the money market is in equilibrium at the price level. P_0. If the supply of money increases to, say, M_1, the people will find now that they have in their hands more money than that they want to hold at the price level P_0 Y and k being fixed as explained earlier. Therefore, they would try to get rid of their excess holdings of money by spending it on goods and services. Since the supply of goods and services (Y) is fixed at the full employment level, the increased demand for goods and services will raise their prices. Thus the price level will go on increasing till the excess holdings of money with the people become zero. Thus the new monetary equilibrium will be established at a higher price level which would be increased in the same proportion as the money supply. Supposing the new money supply, M_1, is double the initial money supply, M_0, the new equilibrium price level, that is, the price level at which the new monetary equilibrium will take place will be P_1 which will be exactly two times the initial price level ($P_1 = 2P_0$)

Similarly, if the supply of money decreases, the new monetary equiibrium will take place at a lower price level which will decrease in the same proportion in which the supply of money decreases.

Thus, in the classical theory the monetary equilibrium takes place through changes in the price level.

Self Check Exercise-6

Q1. Discuss equilibrium in the money market in Keynes's theory.

Q2. Discuss Hicks-Hansen's General Equilibrium Theory.

Q3. Discuss the Classical Apprpach.

12.9 SUMMARY

However, it should be noted that the Keynes's theory as well as the classical theory of monetary equilibrium is incomplete. They should be regarded as complementary to each other rather than substitute of each other. In real life the excess holdings of money in a modern economy with developed financial markets would be got rid of not merely by spending on goods and services but also by purchasing bonds. Thus not only the prices of goods and services but also the bond prices would rise. A rise in bond prices means a fall in the rate of interest. Thus monetary equilibrium in modern economies takes place through changes in both the price level and the rate of interest.

12.10 Glossary

The supply of Money is a stock at a particular point of time, though it conveys the idea of a How over time, the term the supply of money is synonymous with such terms as money stock, stock of money, money supply and Quantity of money. Marshall had rightly said, "Money is the pivot-around which the economic science clusters." The occasional fluctuations in the value of money leave a deep impact on the national economy. The factors influencing the supply of Money have a greater bearing upon the general level of economic activity.

12.11 Answers to Self Check Exercises

Self Check exercise -1

Ans.1. Refer to Section 12.3

Self Check exercise -2

Ans.1. Refer to Section 12.4

Self Check exercise -3

Ans.1. Refer to Section 12.5.1

Ans.2. Refer to Section 12.5.2

Self Check exercise -4

Ans.1. Refer to Section 12.6

Self Check exercise -5

Ans.1. Refer to Section 12.7

Self Check exercise -6

Ans.1. Refer to Section 12.8.1

Ans.2. Refer to Section 12.8.2

Ans.3. Refer to Section 12.8.3

12.12 References/ SUGGESTED READINGS

1. William H. Branson Macroeconomic Theory and Policy Ch. 13.
2. A.D. Bain, The Control of Money Supply, Ch. 2
3. R.L. Teigen, "The demand for and supply of money" in W.L Smith and R. L.. Teigen (eds). Readings in Money National Income and Stabilization Policy
4. J. Tobin, "Commercial Banks as Creators of Money" in W.L.Smith and R.L. Teigne (eds)" Ibid.
5. J.R. Hicks, "Mr. Keynes and the Classicals: A Suggested Interpretation". Econometica, Vol. V (1937) pp. 147-159.

12.13 Terminal Questions

Q.1 What is meant by supply of money? How is it determined?

Q.2 What is high-powered Money? What is its importance in determining the supply of money?

Q.3 Explain how the central bank of a country controls the money supply?

*****

Unit-13

(A) SOME MORE CONCEPTS OF MONEY

(B) THE CLASSICAL AND KEYNESIAN DICHOTOMIES

STRUCTURE

13.1 Introduction

There has been lot of controversy and confusion over the Meaning and nature of money. As pointed out by Scitovsky, "Money is a difficult concept to define, partly because It fulfils not one but three functions each of them providing a criterion of moneyless those of a unit of account, a medium of exchange and store of value. Couiborn's definition of money is very wide. He includes in it the concrete money is very wide. He includes in it the concrete money such as gold, cheques, coins, currency notes, bank draft, etc. and also abstract money which is the vehicle of our thoughts of value, price and worth.

13.2 Learning Objectives :-

After going through this chapter you will be able-

- To Distinguish between inside money and outside money
- To Understand Neutrality of Money and the Classical Theory
- To Understand neutrality of Money and the Keynesian Model.
- To Understand neutrality of Money and the Monetarist View
- To Understand the Real Balance Effect

13.3 "Inside" money and "Outside" money

The concepts of inside money and outside money were first evolved as an aftermath of discussions on "Pigou Effect" "Pigou Effect refers to the change in the division of income between consumption and saving (i.e. in the consumption function and its obverse, the saving function) consequent upon the changes in the real wealth of the society caused by a change in the price level. Crucial to the operation of the Pigou Effect is a particular type of wealth or assets whose real value chages when the price level changes. All such assets whose prices change in the same direction and in the same proportion as the general price level will have unchanged real value. Therefore, Pigou Effect will not work in their case. Such assets usually consist of real assets. There is another type of assets whose nominal values are fixed and therefore whose real values will change with changes in the general price level. Such assets are money, bonds and a host of what are described as "near-money". It is such assets which are relevant to the operation of the Pigou Effect.

Michael Kalecky, in his commet of Prof. Pigou's "Classical Stationary State" published in 1943, pointed out that even the second category of assets, mentioned above, must be classified further, for the Pigou Effect can work only if the change in the real value of assets consequent upon a change in the general price level is such that the society as a whole is made either richer of poorer in terms of real wealth. Following this line of argument it was pointed out that there is a particular type of money such as the bank money, near-money and bonds, in the case of which a clear debtor-creditor relationship exists. In the case of this type of money and near money, any fall in the general price level makes the creditors better off and the debtors worse off. All types of money represent debt of some party. In the case of bank money, for example, the bank deposits are the debt of the banks and claims of the depositors on the banks. A fall in the general level will make the depositors better off hut the banks will become worse off. Therefore the Pigou's wealth effect on consumption expenditure of the depositors will be positive while it will be negative in the case of the debtors, that is, the bankers. Assuming its extent to be equal, these positive and negative effects will cross- cancel each other and the real wealth of the society as a whole (i.e. for macroeconomy) will remain unchanged. Pigou effect will not work in the case of this type of money. It is this type of money that has been described as the inside money.

Thus we can define inside money as that portion of the money stock of money and bonds in the case of which a debtor-creditor relationship exists in such a manner that any change in the general price level will change the real wealth of the debtor and the creditors in the opposite direction and consequently the net effect of change in the real wealths of the creditors and debtors on the consumption and saving functions of the society is zero. This type of money is generally created in the private sector as in the case of bank money.

Outside money, on the other hand, is that portion of the stock of money and bonds in the case of which no actual or perceived debtor-creditor relationship exists. In this case a fall in general price for example, will make the creditors feel better off, shifting their consumption functions upwards and saving functions down-wards, while there would be no such effect in the case of the debtors. It should be obvious that this condition can be satisfied only by the government money, for any fall or rise in the real burden of the debt represented by the government money, for any fall or rise in the real burden of the debt represented by the government money (proper currency and coins) which represent the debt of the government and claims of holders of this money on the government) will not affect the expenditure behaviour of the government. It is in the case of this type of money, the outside money that the Pigou Effect is valid.

Though, as already pointed out above, the roots of this distinction between inside money and outside money is to be found in Kalecky's paper "Professor Pigou on the Classical Stationary State'-A Comment" published in 1944, this distinction was formalised by John G. Gurley and Edward Shaw in their famour work. Money in a Theory Finance, published in 1960. It was they and there that this distinction was described by the nomenclature of inside money and outside money. The range of assets on which the Pigou Effect works so as to give a net positive effect for the economy as a whole when the general price level falls, they described as outside money or wealth, while the range of assets like bank money and private bonds in the case of which Pigou Effect does not work for the economy as a whole, they described as inside money or wealth.

Self Check Exercise-1

Q1. What do you know about the concept of inside money and outside money?

13.4 NEUTRALITY OF MONEY AND THE CLASSICAL THEORY

Money is said to be neutral, if the level of the supply of money or the quantity of money has no effect of its own on the level of economic activity, as measured by the level of output and employment in an economy and other real variables of the economy such as the real rate of interest and the real wage rate, etc. as distinguished from their nominal counterparts such as the money rate of interest and the money wage rate, etc. Whether money is neutral or non-neutral is a matter of great importance. It is because if money is neutral, monetary policy is of no consequence and "money does not matter but if it is non-neutral monetary policy is relevant and "money does matter."

It is generally believed that the classical view on the subject is that money is neutral and it cannot influence the level of output and employment in an economy In the classical model changes in money supply determine only the monetary or nominal values of the rest variables. The volume or level of each real variable measured in its physical unit remains unaffected by changes in the supply of money. This can be easily demonstrated with the help of a graphical representation of the classical macro-model in the form of the set of in diagrams given above.

The diagrams on the left hand side of the shows model represent the real part of the economy while those on the right-hand side represent the monetary part as will become clear soon.

In the above simple classical model it is assumed that there are only two factors of production, labour (1) and capital (K). The amount of capital is assumed to be fixed and fully employed.

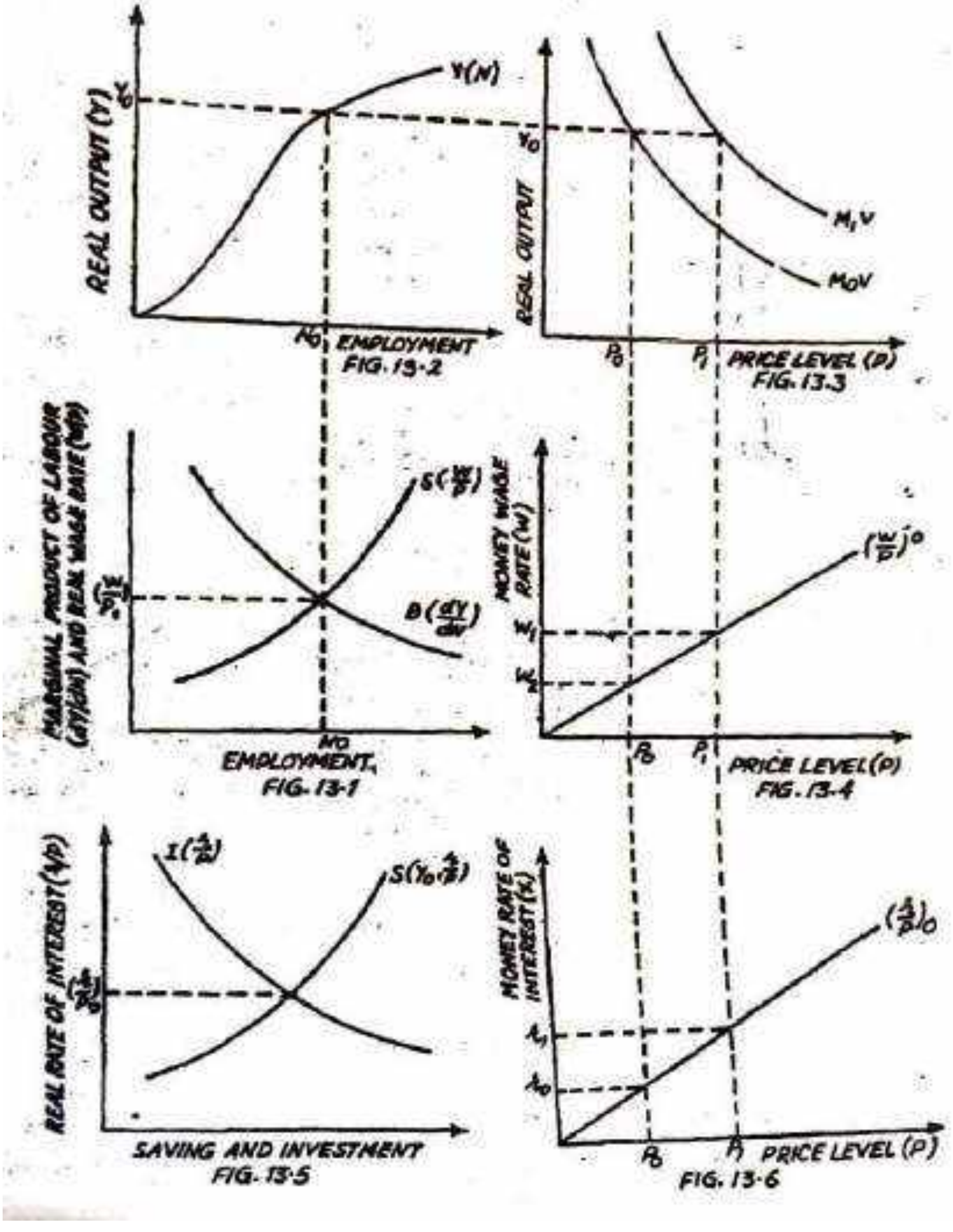


Fig. 13,1 above represent the labour market. The negatively sloping D $\left(\frac{dY}{dN}\right)$ curve is the demand curve of The demand for labour depends on the marginal product of labour $\left(\frac{dY}{dN}\right)$

which, due to the law of diminishing returns, decreases with increase in employment of labour (N). That is why the demand curve of labour slopes downwards to the right. The upward sloping S $\left(\frac{w}{P}\right)0$ sloping s curve is the supply curve of labour showing that supply of labour is a function of the real wage rate $\left(\frac{W}{P}\right)$where W is the money wage rate and P is the general price level. The equilibrium level of employment (N) is given by the point of inter section between the demand curve and the supply curve of labour.

In the Fig. 13.2 we have plotted the classical prodection function, Y = *f* $\left(N\ \overline{K}\ \overline{T}\right)$ where N is the amount labour employed, $\overline{K}$ is the given and constant stock of capital, and $\overline{T}$ is the given and constant technology. Capital and techonology being constant, the classical production function in the fig. 13.2 is written in the simplified form of Y(N). The Y(N) function tells us that with equilibrium employment N_0 the equilibrium level of real output or income is Y.

In Fig. 13.3 we show that the price level of the equilibrium output Y_0 will be determined by the quantity of money. The classical monetary theory embodied in the quantity theory of money is based on the Equation of Exchange, MV=PY where the velocity of money. V is assumed to be constant. If we assume that the quantity of money in circulation is given to be M_0, then M_0 V is also constant so long as the supply of money remains at the level M_0: Therefore the curve M_0 V in Fig. 13.3 above is a rectangular hyperbola which also represents PY = constant as PY = M_0 V. Since we know from Fig. 13.2 that the equilibrium output or real income is Y_0 the M_0V curve in Fig. 13.3 gives us the equilibrium price level P_0. In Fig. 13.4 we have drawn a straight line $\left(\frac{W}{P}\right)_0$ passing through the origin and with its slope equalling the equilibrium real wage rate $\left(\frac{W}{P}\right)_0$ as shown in Fig. 13.1. This straight line has a constant slope equalling $\left(\frac{W}{P}\right)_0$ and shows that any increase in the price level will be accompanied with a proportionate increase in the money wage rate, W. Since we know from Fig. 13.3 that the equilibrium price level consistant with M_0 quantity of money is P_0, the Fig 13.4 tells us that the equilibrium money wage rate is W_0.

Fig. 13.5 represents the capital market. The negatively sloping D $\left(\frac{r}{P}\right)$curve is the demand curve savings which are assumed to be demanded for vestment. Behind it lies the diminishing marginal ....roduct of capital. $\left(\frac{r}{P}\right)$represent the real rate of interest, r being the money rate of interest and P being the price level. Thus demand for savings is a function of the real rate of the interest. It is an inverse function giving it a negative slope. The supply curve of savings S $\left(\frac{r}{P}\right)$ is upward sloping showing that saving is a direct function of the real rate of the interest. The intersection of these two curves gives us the equilibrium real rate of interest $\left(\frac{r}{P}\right)_0$. (Fig. 13.6 gives us the equilibrium money rate of interest r_0 which is consistent with M_0 quantity of money. Here the straight line $\left(\frac{r}{P}\right)_0$ passing the origin has the slope equalling the equilibrium real rate of interest $\left(\frac{r}{P}\right)_0$. P_0 being the price level consistent the M_0 money, r_0 is the equilibrium rate of interest.

Now if we increase the quantity of money from M_0 to $M_1 = 2M_0$ it will have no effect on the real parts of the classical model. There will be no change in the left-hand side diagrams of the above set of diagrams. Equilibrium employment will remain at N_0 as equilibrium real wage rate equilibrium real income, and equilibrium real rate of interest will remain respectively at $\left(\frac{w}{P}\right)_0$. Y_0 and $\left(\frac{r}{P}\right)_0$ But the monetary part of the model will change. The MV = PY curve will shift from M_0 V to the position M_1 V giving the new equilibrium price level $P_1 = 2P_0$ in Fig. 13.3. The equilibrium money wage rate will also change proportionally from w_0 to $w_1 = 2w_0$, as shown in Fig 13.4. And, so will the money rate of interest which, as shown in Fig. 13.6, rises from r_0 to $r_1 = 2r_0$.

Thus we find that a change in the supply of money has no effect on the real variables of the model. Moreover, the monetary or nominal variables of the model such as the price level (P), the money or nominal wage rate (w) and the money or nominal rate of interest (r) change in the same direction and in the same proportion as the supply of money. This demonstrates that money is neutral in the classical model.

Self Check Exercise-2

Q1. Discuss about neutrality of money and the classical theory.

13.5 Conditions of Neutrality of Money

The above classical conclusion regarding the neutrality of money is based on a few explicit or implicit assumptions. In the first place, the classical theory implicity assumes that all the prices including the factor prices are perfectly flexible upwards as well as downward. If some price or prices are rigid, real output will be affected by changes in the money supply. Secondly, the classical theory also assumes the absence of "money illusion". "Money illusion" is said to exist when the people taking decisions are guided in their behaviour not by the real value of the relevant variable but by the nominal or money value of the variables. If "money illusion" exists, a rise in the nominal or money value of income will, for example, shift the saving function and thus cause a change in the real rate of interest which, in turn, will change the level of investment, level of savings, level of employment and the level of real income. Moreover, the change in money supply itself should be neutral in the sense that it should not change the distribution otherwise it will also cause a shift in the saving function leading to changes in the real variables. Any change in distribution caused by a change in money supply will also change the structure of demand for the final products which, in turn, will change the relative prices. Lastly, neutrality of money assumes perfect knowledge of markets on the part of economic agents taking economic decisions. If the information available to them regarding the demand and supply conditions and prices prevailing in different markets is imperfect, real magnitudes of the variables may be by changes in the money supply. Money, then, will not be neutral.

Self Check Exercise-3

Q1. Discuss conditions of neutrality of money.

13.6 Neutrality of Money and the Keynesian Model

Money in the Keynesian model, unlike in the classical model is non-neutral. Changes in money supply in this model influence the real variables and the level of employment and income. An increase in money supply in this model, for example, will lower the rate of interest which, in turn, will increase investment which through the multiplier effect, will increase the level of employment and output. The increase in employment will change the equilibrium level marginal product of labour and, therefore, the real wage rate also.

But this in no way means that Keynes and his followers set a great store by monetary policy as a means of controlling the level of economic activity. According to Keynes, the interest-elasticity of both investment and consumption expenditure is very low. Therefore, in spite of their view that money is non-neutral, the Keynesians did not have much confidence in the effectiveness of monetary policy in controlling the level of economic activity, particularly during depression period.

Moreover, even in the Keynesian model, moeny is neutral in a way in the "liquidity trap" case which is relevant to the periods of depression. So long as the economy is withing the liquidity trap, no increase in the money supply will end up in the lowering of the rate of interest. Therefore, all other things remaining the same, there will be no increase in the aggregate effective demand and the level of employment and income will remain what it was before the increase in the money supply. Therefore change in money supply fails to affect the level of economic activity. Money is thus neutral in Keynes's model in this sense. But it is not neutral in the sense that a given increase or decrease in money supply will change all monetary variables in the same direction and in the same ratio.

Self Check Exercise-4

Q1. Discuss neutrality of money and the Keynesian Model.

13.7 Neutrality of Money : The Monetarist View

The monetarits led by Milton Friedman have revived the Fisherian view, which, in fact, goes back to Hume, that money is non-neutral in the short-run but is neutral in the long run. It is on the basis of their short-run analysis of the relation between changes in the money supply and changes in the level of economic activity are reflected in the changes in the level of employment and income that the monetarists sometimes claim themselves to be more genuine disciples of Keynes than the popularly acclaimed Keynesians.

However, there is one basic difference between the monetarist approach and the Keynesian approach. While the latter emphasises the indirect mechanism through which changes in money supply cause changes in the level of economic activity, the former, on the other hand, emphasise the direct mechanism of this process. The indirect mechanism refers to the process in which a change in money supply first affects the rate of interest and then through it affects the level of consumption and investment which, in turn, causes a change in the level of employment and income. The direct mechanism, on the other hand, works directly through a direct effect of a change in money supply on aggregate expenditure and level of economic activity in the economy.

The monetarist argument is that an increase in money supply disturbs the portfolio balance of the asset-holders. As they find that they have in their portfolios more money in relation to the other types of assets than they desire, they would try to substitute money with other types of assets including physical goods. This raises the aggregate demand for goods. If there is Keynesian unemployment in the economy, this increase in aggregate demand will tend increase employment and output and decrease unemployment. Money thus is not neutral in the short-run which is the Keynesian case.

But, the monetarists also argue, once the full employment consistent with what the monetarists describe as the "natural" rate of unemployment is attained, any further increase in the supply of money has no scope for influencing the level of employment and real output. The whole impact of such an increase in money supply would be on prices.

Like the Keynesians, the monetarists also believe that a more rapid rate of growth of money supply drives down the money rate as well as the real rate of interest due to what they describe as the liquidity effect. But they differ from the Keynesians in their assertion that this effect and, consequently, the non-neutrality of money is only transitory. As Friedman put it in his Presidential address to American Economic Association in 1967, changes in money supply "...........cannot peg interest rates for more than very limited periods and it cannot peg the rate of unemployment for more than very limited period."

Another important difference between the monetariats and the Keynesians is that the former do not attach much importance to the rate of interest, their primary interest being the long-run bank between money and prices, rather than the relation between money supply and output. since, in their view, the long-run output is determined by the quantity and quality of the real resources of the economy.

Self Check Exercise-5

Q1. Discuss the Monetarist view about neutrality of money.

13.8 The Classical Dichotomy

Keynes, in his General Theory, had attacked the classical theory charging it with having dischotomised the economic theory. He argued that the classical theory consists of two separate parts. One part of it deals with the level of output, structure of output, level of employment and relative prices which are explained to be determined by the real forces. This part of the theory is commonly known as the theory of value. The other part deals with the relationship between money and prices and is commonly known as the classical monetary theory. In this part of the classical theory real factors play no part. Thus, it is said, that there is a dichotomy in the classical economic theory. In one part of the classical theory the theory of value only the real factors matter and money does not matter at all; and in the other part of the classical theory the monetary theory-only the monetary factors matter and real factors do no matter at all. This implies that the classical theory is split into two water-tight compartments, there being no link between the classical theory of value or relative prices and the classical theory of money and the absolute or the general price level. It is this compartmentalisation in the classical theory which has come to be known as the classical dichotomy ever since Don Patinkin described it so.

The classical dichotomy is based on the assumption that the all demand and supply functions of real goods and factor services are homogenous functions of zero degree in money prices and money income. That is to say, if all money prices inclusive of factor prices change in the same direction and in the same proportion, then the demand and the supply of each good and factor service will remain the same and their relative prices will also remain the same, unaffected by the change in the general price level. This is only another way of saying that money is assumed to be neutral in its strict sense.

But the classical Quantity Theory which is the classical monetary theory assumes that the demand for goods is influenced by the general price level. This assumpiton is implicit in the mechanism suggested in this theory through which changes in money supply according to it lead to a stable equilibrium general price level. Thus, as Patinkin pointed out, there is a logical in the different assumptions underlying the classical value theory and the classical monetary theory.

Self Check Exercise-6

Q1. Discuss the Classical Dichotomy.

13.9 The Real Balance Effect

Don Patinkin has resolved the classical dichotomy with the help of the his concept of the real balance effect and has thus integrated the classical value and monetary theories.

Real Balance Effect refers to the effect of a change in the general price level on the aggregate expenditure in an economy through its effect on the real value of the nominal cash balances held by the people. If nominal cash balances or money are denoted by M and the price level by P, then the real balances would be represented by the ratio $\frac{M}{P}$. In other words, real balances refer to the purchasing power of nominal balances. Thus a fall in the price level (P) will increase real balances $\left(\frac{M}{P}\right)$ while a rise in the price level will decrease real balances.

In his Money. Interest and Prices, Patinkin has developed his theory of the real balance effect which, as he observes, is a kin to the income effect of the micro- economic theory. When the real balances increase consequent upon a fall in the general price level, an individual would generally tend to spread out this increase in the purchasing power of his nominal balances by adding to all types of his assets including the nominal balances unless any particular asset happened to be an "inferior good" for him. The reverse will happen, if his real balances decreased due to a rise in the price level. Furthermore, he argues that the consumption function as well as its obverse, the saving function, is also influenced by changes in the real balances. Therefore, when the price level falls and real balances increase, the consumption function shifts up- wards and people's consumption expenditure at any given level of income would be greater than before the fall in the price level. This part of the real balance effect is similar to be Haberler-Pigou effect or the wealth effect to which we referred while explaining the concepts of inside and outside moneys. But Patinkin's real balance effect is comprised of both the Haberler-Pigou effect and the Keynes Effect. The Keynes Effect refers to the effect of a fall in the price level on the aggregate expenditure through its effect on the rate of interest. At a lower price level, the transaction demand for money is less so that the money supply available for satisfying the speculative motive increase and consequently the rate of interest falls which may increase both the investment and the consumption expenditure. Patinkin's real balance effect includes the Keynes effect also.

Self Check Exercise-7

Q1. Discuss the Real Balance effect.

13.10 Integration of Value and Monetary Theory

(The Resolution of Classical Dichotomy)

In the light of the nature of classical dichotomy explained above in section (6) of this lesson it is obvious that this dichotomy could be resolved only through an integration of the classical value theory and the monetary theory. Patinkin has performed this job with the help of his concept of the real balance effect as follows :-

The classical theory known as the Say's Law has two versions, as pointed out by Mark Blaug. One version which states that aggregate demand for goods is always equal to aggregate supply of goods is an identity and not a genuine theory. If we take this version along with the Walras Law and the economy to consist of two markets, the goods market and the money market, the Say's Indentity would imply, as Kalecki had pointed out, that money market is also always in equilibrium and, therefore, the general price level becomes in- determinate. The goods market or the real market and the money market are always in equilibrium not because of the prices but in spite of the prices. The monetary theory is irrelevant in this case.

However, the other version of Say's Law which is described as Say's Equality which states that a freely competitive economic system tends to attain full-employment equilibrium automatically, provided all prices inclusive of factor prices are perfectly flexible.

Now, if we divide the economy into two markets, the goods market and money market and express the above version of Say's Law, that is, Say's Equility in a Walrasian form, then the full-employment equilibrium system of the economy may be expressed as follows:-

(1) $$\sum_{i-1}^{n-1} piDi = \sum_{i-1}^{n-1} piSi$$

which represents equilibrium in the goods market assumed to be comprised of n-1 number of the real goods. The above equation (1) implies that the aggregate demand for the (n-1) goods represented by the lefthand side of the equation (1) equals the aggregate supply of goods represented by the right-hand side of the equation (1). In this P_1 represents the price of ith good and D_1 and S_1 represent respectively the quantities demanded and supplied of the ith good.

Since the goods market is in equilibrium and there being only two markets, the other market, that is, the money market will also be in equilibrium as implied in Walras's Law. This means that

(2) $D_n = S_n$

That is, the demand for the nth good which is assumed to be money equals the supply of the nth good. In other words, the demand for money equals the supply of money.

Now, let us suppose that there is overproduction in the goods market so that the equality (1) above becomes the following inequality:

(3) $$\sum_{i-1}^{n-1} piDi = \sum_{i-1}^{n-1} piSi$$

which means aggregate demand for goods is less than the aggregate supply of goods. This combined with Walras's Law implies that

(4) $D_n > S_n$

That is, the demand for money is greater than the supply of money. Thus there is disequilibrium in both the markets. As the result of overproduction or excess supply in the real goods market, prices of goods will begin to fall and thus the general price level will fall. As the result of it the real balance in the hands of the people will increase. Due to the real balance effect, demand for goods will begin to increase. People will find that they are holding more real balances than they want to at the lower price level. They would get rid of the excess holdings of money by spending it on goods and other assets such as bonds. As the bond prices rise, the rate of interest will fall which will induce increase in investment and consumption expenditure. This means that the aggregate expenditure on goods will increase directly as well as indirectly. Thus the prices and interest rate will go on falling and aggregate expenditure will go on increasing due to the real balance effect till the full-employment is regained automatically. The only condition for this is that all prices are perfectly flexible.

Interpreted thus, the real balance effect of Patinkin shows that the goods market and the money market in the classical system are not independent of each other but are integrated with each other. Thus we see that the equilibrium in the real part of the economy is attained not in spite of the prices but precisely because of the prices. And the link between the two parts of the economy, the real part made up of real goods and the montary part made up of money is provided by the real balance effect. The relative price, moreover, are not independent of the general price level. Rather, there is a separate set of relative prices corresponding to each general price level. It is thus that Patinkin's real balance effect has helped in integrating the classical value theory and the classical monetary theory and thus resolving the classical dichotomy.

Self Check Exercise-8

Q1. Discuss about Integration of Value and Monetary theory.

13.11 The Keynesian Dichotomy and The IS-LM Model

Though Keynes had criticised the classicals for dichotomised economic theory, yet his own theory was not completely free from this type of fault. His General Theory too, as pointed out by Harry G. Johnson, had dichotomised economic theory, because his analysis in the General Theory consists of two separate parts. One part of it consists of an income theory in which the rate of interest enters exogenously, and the other part of its consists of a monetary theory in which the level of income enters exogenously. In the first part, that is, income theory there is only real analysis, the whole focus being on the real factors. Any monetary variable mentioned is treated only as an exogenous factor. In the other part, that is, the monetary theory, almost the whole focus is on monetary factors, while the real factors like the level of real income are. Be treated not as an integral part of the monetary theory but only as exogenous factors. It is this methodology used by Keynes in his General Theory that has come to be known as the Keynesian Dichotomy and it is this dichotomy that left even the liquidity preference theory as an indeterminate theory of the interest rate.

The above Keynesian dichotomy was resolved in the Hicks-Hansen or IS-LM model.

Hicks has argued that in the classical theory saving is a function of both the rate of interest and the level of income. Therefore, we can have a series of saving schedules linking saving with the rate of interes each particular such schedule being associated with a particular level of income. The saving schedules S_1, S_2, S_3, S_4 .... in Fig. 13.7. represent such a series of saving schedules or curves.

The higher is the level of income, the further to the right is the saving schedule associated with it. It is because at any given rate of interest, more will be saved at a higher level of income than at a lower level of income. II' is the investment schedule or curve superimposed on the series of saving schedules S_1, S_2, S_3, S_4..n Fig. 13.7.

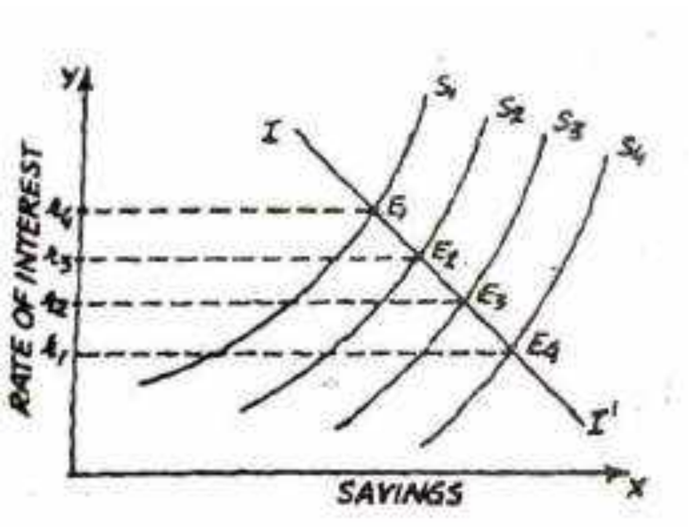


Fig. 13.7

The investment schedule II' has a negative slope as more investment will be forthcoming only at a lower rate of interest. Behind the II curve lie the diminshing marginal product of capital, in the Keynesian terminology, the diminishing marginal efficiency of capital. Its position is fixed by the state of what Keynes described as business expectations. The points of intersection between the various saving schedules and the investment schedule such as E_1, E_2, E_3, E_4 .... are all points of equilibrium as on each of them the desired investment equals the desired savings. However, one of them relates to a given level of income which generates the particular saving schedule on which the given point of equilibrium lies. For example, E_1 lies on S_1 which is associated with a level of income which we may denote with Y_1. The point E_1 then, tells us that Y_1 will be the equilibrium level of income, if the rate of interest is r_4 which corresponds to the equilibrium point E_1 in our Fig. 13.7. If the income level rises to Y_2 the saving schedule shifts to the position S_2 and now the equilibrium takes place at E_2 that is, Y_2 will be equilibrium level of if the rate of interest is r_3 which corresponds to the equilibrium point E_2 and is lower than the interest rate r_4. In this way we can find out from all such equilibrium points as E_2, E_2, E_4 E, ... the combinations of the different levels of income and the necessary and the corresponding rates of interest which would make those levels of income equilibrium levels. When we draw a curve passing through all such combinations of equilibrium levels of income and the corresponding rates of interest, we shall get a curve like the IS curve in Fig. 13.8 below.

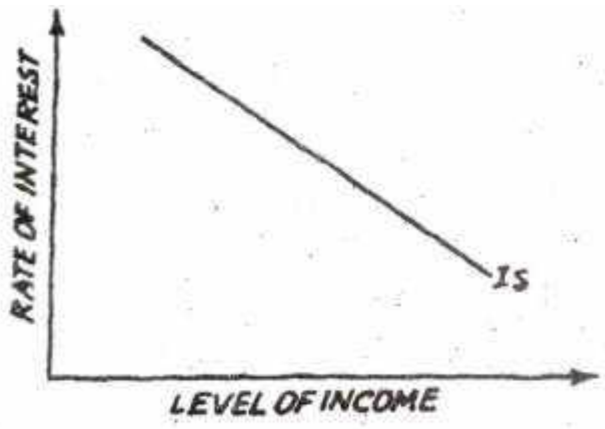


Fig. 13.8

It has a negative slope (sloping downwards to the right) because as we saw, above, a higher level of equilibrium income is associated with a lower rate of interest. It is also obvious that on each point on this IS curve the desired savings equal the desired investment. Therefore, the IS curve can be defined as the locus of all such combinations of the rate of the interest and the level of income at which the desired savings equal the desired investment. This curve by itself can tell us neither the equilibrium rate of interest nor the equilibrium level of income. But it can tell us what the equilibrium level of income would be, provided we know what the equilibrium rate of interest is. Keynes's income theory allowed the equilibrium rate of interest to enter exogenously without explaining it. So we can say that the income theory of Keynes was indeterminate so long as the monetary theory which explained the rate of interest was not integrated with his income theory. In his model the economy is divided into two markets : The product market where equilibrium real income is determined and the money market where the equilibrium rate of interest is determined. The cause of the Keynes's dichotomy was that he left the two markets unintegrated.

Let us now have a look at the money market in the light of Keynes's liquidity preference theory of the rate of interest. Keynes argued that liquidity preference or the demand for money is a function of both the rate of interest and the level of income. His liquidity preference function is explicitly L (r, Y). This means that there is no unique liquidity preference schedule but a whole series of liquidity preference schedules, each one of which is associated with a particular level of income as shown in Fig. 13.9 below.

We know from Keynes's liquidity preference theory that at a given of income lower rate of interest is associated with a higher liquidity preference or demand for money such that at a critically minimum rate of interest the demand for money become infinitely elastic causing the so-called "liquidity trap". All this is shown by the series of liquidity preference schedules L_1, L_2, L_3, L_4 .... which merge into one another at a critically minimum rate of interest and have negative slopes. Since the theory implies that given the rate of interest, a larger quantity of money is demanded at a higher level of income than at a lower level, the L-curve will shigt to the right with an increase level of income. Thus our Fig. 13.9 above L_1, L_2, L_3, L_4.......................... curves are associated with $Y_1 < Y_2 < Y_3 < Y_4 <$ levels of income.

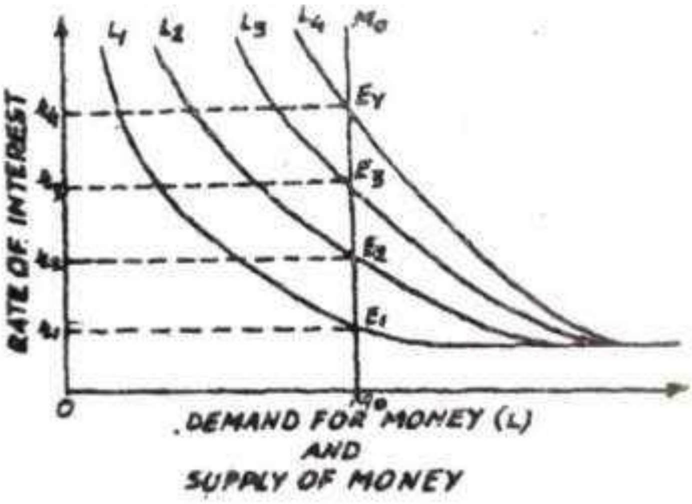


Fig. 13.9

Since in the liquidity preference theory money supply is exogenously determined and is therefore assumed to be independent of the rate of interest, it is shown by the vertical line $M=_0$ M_0 in Fig 13.9. The points of interesection between this money supply curve and the various liquidity preference curves are all equilibrium points at which the demand for money equals the given supply of money. All of them indicate equilibrium rates of interest such r_1, r_2, r_3, r_4,. but each one of them is linked to a particular L curve which, in turn, is associated with a particular level of income. In other words, we cannot determine the equilibrium rate of interest unless we first know what the equilibrium level of income is. Thus Keynes's theory of interest was also indeterminate. He brought in the equilibrium level of income exogenously without intergrating it with the theory of interest.

However, we can derive from Fig. 13.9 above curve like the LM curve in Fig. 13.10 below. The equilibrium points E_1, E_2, E_3, E_4 **.........** in Fig. 13.9 represent the various combinations of the equilibrium rate of interest and the corresponding level of income. It is clear in Fig. 13.9 that a higher equilibrium rate of interest is associated with a higher liquidity schedule and therefore with a higher level of income. If we join all these combinations of equilibrium rate of interest and the corresponding level of income through a curve, we shall get the LM curve in Fig. 13.10 above It is the locus of all those combinations of the interest rate and income level at which the demand for money equals the supply of money. It can tell us what the equilibrium rate of interest would be, provided we know what the equilibrium level of income is.

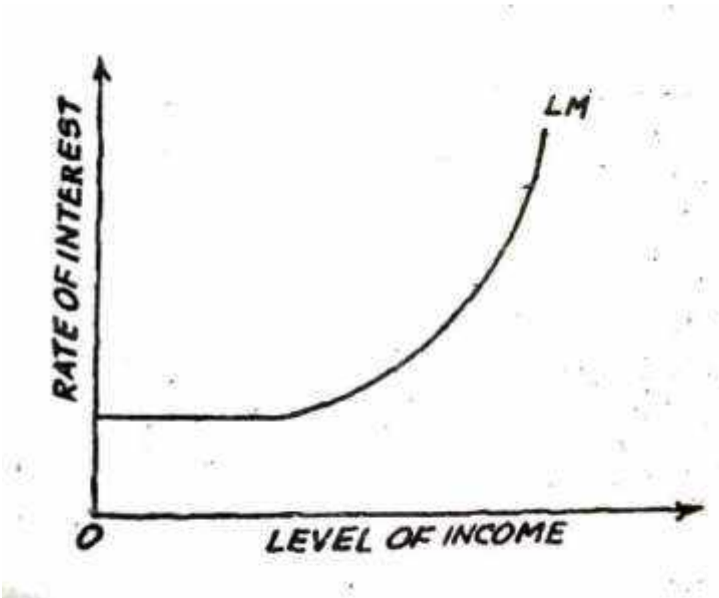


Fig. 13.10

Thus it was not possible to determine either the equilibrium level of income or the equilibrium rate of interest, if we treated the two markets, the product market and the money market, separately and independently of each other as Keynes did. The dichotomy in Keynes's theory could be removed only be integrating the two markets and treating them together within a frame-work of general equilibrium analysis as represented by the IS-LM model.

Within the IS-LM model both the equilibrium income level and the equilibrium rate of interest are determined together in a state of general equilibrium as shown in Fig. 13.11 below where the IS curve of Fig. 13.8 is super imposed on the LM curve of Fig. 13.10.

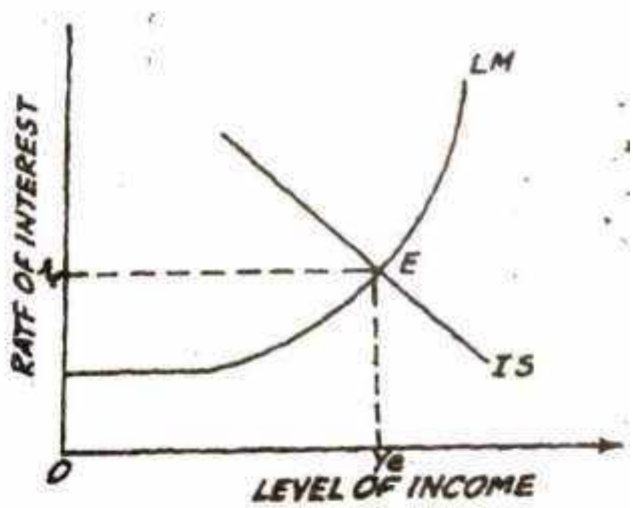


Fig. 13.11

The point in Fig. 13.11 at which the IS and LM curves interest each other determines simultaneously both the equilibrium rate of interest (r_e) and the equilibrium level of income (Y_e). In this position both the product market and the money market are in a state of simultaneous equilibrium. The income theory and monetary theory thus become integrated with each other and the Keynesian dichotomy is removed.

Self Check Exercise-9

Q1. Discuss the Keynesian Dichotomy and IS-LM Model.

13.12 Summary

Don Patinkin in his monumental work Money, Interest and prices criticises the Cambridge economists for the homogeneity Postulates and the dichotomisation of goods and money markets and the reconciles the two markets through the real balance effect.

The homogeneity postulate states that the demand and supply of goods are affected only by relative prices. It means that a doubling of money prices will have no effect on the demand and supply of goods. Thus this homogeneity postulate precludes the price level from affecting the goods market as well as the money market.

Besids removing the classical dichotomy and homogeneity postulates and integrating the Monetary and value theory through the real balance effect, patinkin also validates the quantity theory conclusions. According to patinkin, the real balance implies that people do not suffer from money illusion. They are interested only in the real value of their cash holdings. In other words, they hold money for 'what-it-will buy'. This means that a doubling of the Quantity of money will lead to a doubling of the price level but relative prices and the real balances will remain constant and the equilibrium of the economy will not be changed.

13.13 Glossary

The real balance effect, demonstrates three theoretical points : First. It eliminates the classical dichotomy between value and monetary theory, second, It validates the conclusions of the Quantity theory that in equilibrium money is neutral and the interest rate is independent of the Quantity of money through the real balance effect. Third, the wage-price flexibility leads to full employment in the long run and that the Keynesian under employment equilibrium is a disequilibrium situation.

13.14 Answers to self check Exercises

Self Check exercise -1

Ans.1. Refer to Section 13.3

Self Check exercise -2

Ans.1. Refer to Section 13.4

Self Check exercise -3

Ans.1. Refer to Section 13.5

Self Check exercise -4

Ans.1. Refer to Section 13.6

Self Check exercise -5

Ans.1. Refer to Section 13.7

Self Check exercise -6

Ans.1. Refer to Section 13.8

Self Check exercise -7

Ans.1. Refer to Section 13.9

Self Check exercise -8

Ans.1. Refer to Section 13.10

Self Check exercise -9

Ans.1. Refer to Section 13.11

13.15 References/ SUGGESTED READINGS

1. Gail E. Makinen, Money The Price Level And Interest Rates pp. 30-32, 154-156, 225-226, 375-382.
2. H.G. Johnson, Selected Essays on Monetary Economics, Ch. 1, II, III & V.
3. Don Patinkin, Money, Interest and Prices
4. Don Patinkin, "Money and Wealth: A Review Article." The Journal of Economic Literature Vol 8. No. 4 (Dec., 1969)
5. G.R. Hicks, "Mr. Keynes and the Classics: A Suggested Interpretation."
6. A.H. Hansen, A Guide to Keynes

13.16 Terminal Questions

Q.1 Explain Patinkin's Real balance effect. How does it help us in resolving the classical dichotomy?

Q.2 Is there a dicholomy in Keynes's theory? If yes explain it.

Q.3 Explain the IS-LM macro model. How does it help in removing the Keynesian dichotomy?

****

Unit-14

BUSINESS CYCLES (1)

STRUCTURE

14.1 INTRODUCTION

We shall be dealing in the present lesson, with a subject which has been an important topic of macro-economic analysis even before the modem macro-economics came into sway. It has been a matter of common observation that economic activity free-market capitalist economies has been growing and progressing not in a smooth manner but through ups and downs. This means that economic change over time in capitalistic free-market economies has not been monotonic in character. To the contrary, it has been periodic in character. A periodic change is a change that revises its direction periodically.

14.2 Learning Objectives :

After going through this chapter you will be able

- To know the Business Cycles
- To Understand the Characteristics and Course of business cycles
- To Understand Business Cycle Models

14.3 Meaning of Business Cycle:

Broadly speaking there are four types of changes in economic activity: 0) random change, (ii) seasonal change, (ii) secular change and (iv) cyclical change, Random change is due to factors which usually come from outside the economic system and are irregular and non-recurrent, such as wars, political upheavals, floods, earthquakes, etc. Seasonal change in economic activity comprises variations of economic activity caused by changes in seasons or by particular customs. This is a type of recurrent and periodic change which appears to cover a relatively very short period usually not exceeding a calender year. Sales, for example, reach their peak in India during the first week of a month after which they begin to contract to touch the bottom in the last week of the month. This pattern is repeated more or less every month.

This particular periodic change is caused by the custom of paying wages and salaries in our country on the first day of each month. This is thus an example of seasonal change in economic activity. Similarly, in India economic activity is usually at a high level when the rabi and kharif crops are harvested and are being brought to the markets, after which economic activity subsides to rise again at the time of the next harvest. This too is a periodic seasonal change caused by the agricultural season and spanning a time period not exceeding a calender year.

Secular change in economic activity refers to such movement of the indicators of economic activity which is sustained movement in a particular direction alone and which takes place over a period running into decades. Such a change, therefore, is monotonic and is also referred to as the "trend". This change is usually ascribed to what have come to be described as the 'growth factors', such as increase in population and technical progress.

Cyclical change, which is relevant to the study of business cycles (or trade cycles) is a change in economic activity which itself in alternating waves of expansion and contraction recurring in a familiar pattern and requiring two to several years to complete its course. Thus, it differs from random change in that it is a regular and recurring phenomenon. It differs from the seasonal change because unlike the seasonal change it is not necessarily repeated to the same degree and in the same period. This is apart from the fact that its periodicity is irregular and exceeds the maximum one-year periodicity of seasonal change. It differs from the secular change, because unlike the latter it is a periodic change and not a monotonic change.

A business cycle may thus be defined as "a recurrent fluctuation that occurs at about the same time in many economic series and has a periodicity that varies from a minimum of one year to a maximum of ten to twelve years" (S. Bober, The Economics of Cycles and Growth). However, this definition refers to what is now known as a major or after the name of its first discoverer, Juglar Cycle. Some other economists have further discovered that, apart from the major cycle, there are other recu rent economic fluctuations with a more or less systematic pattern but which have a periodicity either smaller or much greater than that of the Juglar Cycle. One of these fluctuations is identified as the Minor or Kitchin Cycle which has a periodicity of three to four years. Another is known, after the name of its first discoverer, as the Kondratieff Cycle which has a periodicity as long as from fifty to sixty years. Then there is a specific cycle known as the Building Cycle which occurs in the building industry and has a periodicity of fifteen to eighteen years.

Our first task should be to give a descriptive account of the business cycle before we explain the various models evolved by different economists to explain this phenomenon.

It was said above that a business cycle refers to a systematically recurring phenomenon in which a period of increasing economic activity is followed by a period of decreasing economic activity which, in due course of time, is again superceded by a period of increasing economic activity, and this sequence goes on repeating itself like a cyclical movement. Here, the key term is the 'economic activity'. How do we know that economic activity is increasing or decreasing? We measure economic activity with reference to the indices of economic activity such as the volume of production, income and employment in an economy. When production and employment in most of the industries are increasing, the incomes in the economy must also be rising. This trend is taken to indicate that economic activity is rising. This need not mean that production and employment must be increasing in each and every industry. There might be some industries in which production and employment are falling, while in the economy as a whole aggregate production and employment are rising. Usually, in periods of rising economic activity, the general price level is also rising and thus this too is treated as an indicator of the level of economic activity. However, this is not a very reliable indicator, for, price level can rise or fall without there being any change in production and employment; or, as it happened in the post-Warld War II period that production and employment may fall and yet the general price may rise.

As the rising volume of production and employment in the economy as a whole is an indicator of the increasing economic activity, even so a falling volume of production and employment in the economy as a whole is an indicator of the declining economic activity. Usually, periods of declining economic activity are also the periods of falling general price level.

Self Check Exercise-1

Q1. What is the meaning of Business cycles?

14.4 Phases of Business Cycle :

Having seen what exactly the increase or decrease in economic activity means, let us now know the different phases through which a business cycle passes. A business cycle has broadly four phases. A business cycle may be imagined to start at the trough or the lowest point which is more familiarly known as the 'depression'. During this phase, the level of economic activity is at its lowest with the volume of production and employment touching the rock bottom. Incomes too are at their lowest and the general price level as well is usually very low. Sooner or later, the economic activity recovers and passes into a phate of expansion in which production and employment in most of the industries are increasing, incomes are increasing and, as is more likely. the prices are also rising. In course of time the economic activity swings upto the peak level where production and employment and incomes are at the highest levels and so is, perhaps the price level too. This phav of the cycle is more familiarly known as the boor or prosperity. The economy however, does not say long in this phase. Sooner or later, there sets in a recession in economic activity which soon takes the form of a cumulative contraction when production and employment in most of the industries are falling head-long, dragging down incomes and prices too along with themselves. Ultimately this down- swing lands the economy once again into the trough or depression. And, in course of time, the above process would commence again. Thus, we find that the broad four phases of a business cycle are (1) the trough or the depression, (2) expansion or the upswing (3) the peak or the boom or the prosperity, and (4) contraction or the downswing. If we like to treat recovery and recession as distinct phases and not simply as the starting points of expansion and contraction respectively, we can make the total number of phases, through which a business cycle passes, as six with the following sequence: Depression, Recovery, Expansion Prosperity, Recession and Contraction ending again into Depression.

Self Check Exercise-2

Q1. What are different phases of Business cycles?

14.5 Characteristics of Business Cycle :

The above phases of a business cycle and their sequence highlight an essential characteristic of these cyclical fluctuations of economic activity, namely, that they are wave-like movements having their peaks as well as troughs. However, still another important characteristic of a business cycle is that it has no fixed periodicity: the duration of an entire cycle as measured from trough to trough or from peak to peak is not uniform for all business cycles. Not only that but even the duration of any given phase is not uniform for all business cycles. For example the average duration of 26 cycles from 1854 to 1961 in the U.S.A. measured from trough to trough had been found to be 45.7 months, the range from the shortest to the longest being 28 to 99 months. Although the duration of any particular cyclical phase is not the same for all business cycles, yet it has been generally observed that expansions are generally longer than contractions. The U.S. statistics show that, over the above said 26 cycles from 1854 to 1961, the average duration of the expansion phase has been 29.9 months, while the corresponding average duration of the contraction phase has been only 19 months. In view of it we may say that all business cycles are similar but not identical in character, or as Pigou observed, all trade cycles belong to the same family but among them there are no twins.

Another feature of business cycles is their synchronic character; that is the economic activity rises and falls more or less at the same time in almost all the industries. This is but natural because all industries are interlinked through input-output relations. But this does not rule out the presence of leads and logs. The so-called synchronic character of a business cycle emphasises only that a rise or fall of activity in one sector of the economy will soon spread into the other sectors. But, of course, there will be some industries which will be leading the over-all change, while there will be others which will be following this over-all change with a lag. In so far as different national economies of the world are interlinked through foreign trade relations, the cyclical -fluctuations are bound to become international in character. This, of course, presumes the presence of free trade.

Although output and employment rise or fall together in almost all the industries, they do no rise or fall to the same extent in all of them. For example, there are greater fuluctuations of output and employment in investment goods industries than in the consumer's goods industries. And, even among the consumer's goods industries, there are greater fluctuations in industries producing consumer's durables than in industries producing non-durable consumer's goods. Moreover, a contraction does not reduce the output and employment in agriculture as much as it reduces the agriculatural prices. Similarly an expansion does not increases the output and employment in agriculture as much as it increase the agricultural prices. The effects of contraction and expansion on industrial output and employment, on the one hand, and on industrial prices, on the other, are the reverse of those described above in the case of agriculture. During contractions industrial output and employment fall more than industrial prices, and during expansions industrial output and employment rise more than industrial prices. It is important to remember these characteristics, because any satisfactory theory of business cycles must be able to account for these characteristics.

Last, but not least, is the cumulative character of business cycles. A movement in one direction is self-reinforced on the way and goes on gathering momentum till a "ceiling" or a "floor" is hit. Thus expansion feeds on itself till there is the boom or prosperity peak. Similarly, contraction too feeds on itself and becomes larger and larger till it is caught into depression.

Self Check Exercise-3

Q1. What are different characteristics of Business cycles?

14.6 The Course :

Having underlined the chief characteristics of business cycles, we shall now give a more detailed account of what usually takes place during the phases of a business cycle. We shall start from describing the recovery of a hypothetical economic system from a state of depression.

The essential point is how the recovery takes place, or, to use the economic jargon, what accounts for the "lower turning point' of the cycle. The factors which prepare the setting for recovery are as follows: During the depression the costs fall sufficiently to catch up with the falling prices which, in all probability, must have already levelled off after hitting the rock bottom. Cost having thus come in line with the prices of goods and services, the business is on the verge of becoming profitable. During depression firms sell out of inventories neglecting additional production. They also let their inventories of raw materials deplete. As earlier stocks of finished goods are sold off and some additional output becomes necessary, the inventories of raw materials are found to be inadequate. Increased demand orders for replenishing inventories, through the multiplier effect, prepares the ground for an upturn in economic activity.

The reinforcement is likely to come from another direction too. Producers have been postponing the replacement of their worn out and obsolete durable equipment under the impact of contraction and the subsequent depression. Consumers, being hit by falling incomes, have postponed the replacement of their durables a little too long. This implies that a large accumulated demand for capital goods as well as consumers durables is about to come out in the open.

There are, in addition, large quantities of excess cash reserve with the banks so that the credit potential is great and the interest rates are low. This also helps to improve the profit outlook. In addition, the depression weeds out the inefficient and weak firms so that the remaining firms are now financially sound.

The above makes up the setting for recovery. Only some starter or to use Frisch's term, some 'impulse' is needed to spark the economy to expansion. Such an impulse' may come from an important technological discovery, some favourable international development, government action, some dramatic and confidence inspring political development, an increase in the purchase of consumers' durables and capital goods that a is sustained and initiates an inventory expansion, and so on.

Once such a starter comes into operation, the kall economic system generates such responses that actual recovery starts and it gradually passes into an mexpansionary process in a cumulative, manner. The rise demand for goods, caused by the coming into force of nestarter or starters described above, leads to increased demand for labour and thus increases employment as well as output. The incomes of the people rise in response to which the consumption expenditure increases. There are increases sales, and production and employment, are further encouraged, which in turn increase sales still more. This has the effect of transforming the till now, pessimistic business expectations into optimistic ones so that MEC schedules are lifted upwards. Demand for loans increases. This upturn in economic activity makes the banks optimistic, and, since they have large excess reserves, increased supplies of loanable are available without a rise in the rate of interest.

Once the recovery starts, it takes on the form of a cumulative process of expansion in which different expansionary forces reinforce each other. As consumption demand rises, existing excess capacity is eliminated and soon the productive capacity of the consumer goods industries becomes inadequate. There are thus increased orders for the supply of capital goods. The investment demand rises. It not only rises but rises in a magnified form in relation to the rise in 200 consumption demand due to accelaration effect. In consequence, the demand for labour and raw materials rises still further.

In the initial states of recovery,, fixed costs are spread over a large output and, wages are also low and Fu do not rise due to the large backlog of unemployment. Consequently, the average costs are low. Prices however, begin to rise in response to increasing demand. Thus, profit margins are widened and investment is encouraged.

Rising sales, rising pieces and rising profits induce inventory accumulation in anticipation of still greater volume of sales and higher prices. There is further increases in purchasing power but, as the existing productive capacity of consumer's goods industries is approached, the increase in the production of these goods begins to lag behind and prices rise still higher breeding inflation. Expansion of bank credit and the reduction for the idle cash balances provide the monetary support to the economy's upwards sweep.

There is a widespread optimism as the cumulative forces of rising production, employment, incomes, sales, prices and profits support one another. This optimism is pets conducive to increasing investment which, with the help of the cumulative forces, pulls up the economy into the boom position.

But, as already observed, the economy is not destined to stay for ever in this position. Sooner or later," there is bound to be a downturn or recession in the economic activity. The setting for a recession is composed of the following forces which take birth in the no preceding phase of the boom. During the boom, the wage rates rise substantially. Prices of raw materials, respecially of agricultural raw materials, also rise as situations of excess demand develop. At the same time, the cash reserves of the banks are at the minimum necessary level so that the supply of bank finance becomes inelastic and the interest rates rise. The net effect of all these factors is to increase the costs of production. As the productive capacity of the economy is over-reached, there are steeply rising average costs. Thus the rising costs catch up with the prices and begin to squeeze profits. The profit outlook begins to deteriorate. Because of the boom time expansion of captial equipment and accumulated inventories of raw materials, the replacement investment becomes postponable. The speculative piling up of inventories during the boom makes their volume far in excess of what is justified by the current volume of sales. This very fact may force the, firms to liquidate their inventories so that it becomes more than a mere part of the setting for recession: it may turn out to be a starter of recession. Moreover, firms are over expanded during the boom so that they become financially weak and vulnerable. Finally, as the prices reach very high levels, consumers become price conscious. Bankers too grow cautious. This reins in the prevailing optimism among the businessmen too.

In such a setting the recession or the downturn may-be triggered by some unfavourable event or events, viz inventory liquidation, squeeze on profits due to rising costs, consumers' resistance to high prices, credit squeeze, financial distress aborad, unfavourable political events. a dramatic business failure, declining stock market etc.

Once there is recession and contraction starts, the economic system engenders forces which make the contractionary process cumulative in character making it feed on itself. Investment spending is reduced and inventories are increasingly liquidated. Production and therefore, incomes too fall. The fall in incomes pulls down the consumption expenditure. The demand for consumers' goods falls. Sales fall, which forces the producers of consumer goods to suspend or reduce their orders for investment goods and raw materials. You know that the principle of acceleration requires the consumption demand should increase not in absolute terms alone but at a constantly increasing rate, if investment is to go on increasing. Any fall in the rate of increase of consumption will pull the investment. Thus the fall in consumption calls forth a further decrease in investment which through the multiplier effect, reduces incomes and consumption still further. Thus there is a sort of vicious downward spiral, and the cumulative forces go on dragging down the aggregate effect demand. Prices too go on falling alongwith. But costs lag behind because of their contractual nature. This reinforces the constraction in output and employment. Inventories are liquidated even at prices less than the purchase price. At such a time psychological factor in the form of adverse expectations makes the already confused situation worse confounded. For, the falling prices create expectations of further fall in them in future, so the consumers as well as the producers postpone their purchases, thus aggravating the falling trend in the aggregate demand, output and employment. If these forces are allowed to work freely, their increasing momentum sweeps the economy down into depression where it stays for sometime till the recovery comes.

Self Check Exercise-4

Q1. Discuss the Course of Business cycles?

14.7 Business Cycle Models :

A business cycle is a very complex phenomenon and, as we have already observed, despite their common characteristics, it is usually not possible to trace even any two cycles to the same causes. The descriptive account of the business cycle given above does provide us with an insight into the mechanism by which expansions and contractions become cumulative in character. There is almost unanimity of view on this. But the real task is to explain the factors which actually spark recovery or trigger recession. In other words, a fundamental task of a satisfactory model or theory of trade cycle is to indentify the factors which account for the turning points of a trade cycle, and it is here that unanimity is lacking, in consequence of which; there has been a plethora of theories of the business cycle. We have not enough time and space to dwell on all these theories. We shall choose only some of the more important modern models of the business cycle for explanation. In the present lesson we shall touch upon a variant of the Keynsian model and explain the Multiplier-Accelerator Interaction Model of Samuelson.

14.7.1 Kaldor's. Model :

A Keynesian variant of the model of a business cycle, developed particularly by Kaldor, assumes that investment is a function of the level of income as well as of the capital stock. The additions to capital stock, as net investment goes on taking place, have the effect of reducing the marginal efficiency of capital. Thus, while investment is assumed to be an increasing function of income, it is assumed to be a decreasing function of the size of capital stock. Moreover, the investment function. I(Y), is assumed by Kaldor to be non-linear unlike the linear investment function of the simple Keynesian income theory. The non-linear investment function is assumed to be S-shaped like the I (Y) and I' (Y) functions in Fig. 14.1. S (Y) is the saving function which is also assumed by Kaldor to be non-linear but for the saka of simplicity it is assumed to be linear in the following explanation.

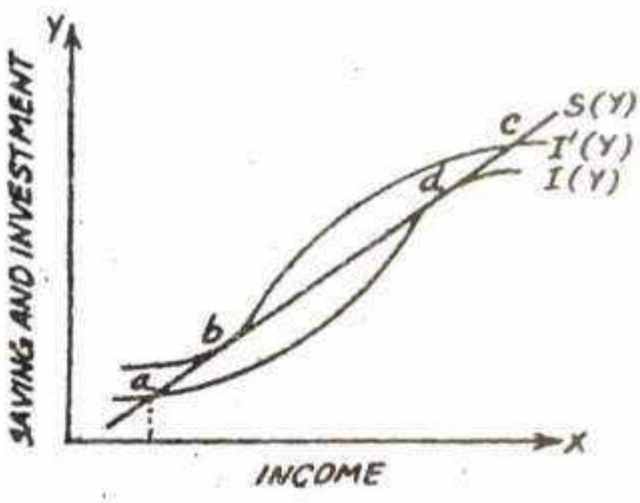


Fig. 14.1

At point, a, in Fig. 14.1 the relevant investment function is I(Y). The point, represents the low level equilibrium of the economy during the depression period. To the right of this point, investment is less than savings, and, to the left of it investment is greater than savings. So, it is a point of stable equilibrium.

Now the question is how this low level equilibrium is broken and the economy is pulled out of depression. During the depression the capital stock of the economy dwindles, because even the replacement is neglected. This raises the marginal efficiency of capital. This factor may also be supported by the fact that there is a minimum level of income at which consumption becomes equal to income. If income falls further below it, consumption may fall but it would be now greater than income. Thus, the fact of marginal propensity to consume being less than one has a stabilising effect. In consequence of it particularly due to the effect of dwindled capital stock, the investment function will shift to the position I (Y). The economy may jump from the position a to the position b which, in fact, is the lower turning point of the business cycle. Such a shift in the investment function may be caused also by some technological innvocation which makes the existing equipment obsolete and also helps to reduce costs.

When the economy is at position b, investment to its left is greater than savings and so is it even to the right of it. Hence it is a point of unstable equilibrium. A little increase in investment pushes the economy into a cumulative expansionary path till a new stable equilibrium is attained at a position like e in Fig. 14.1. This represents the peak level equilibrium of the boom period. This is a position of stable equilibrium because to the left of it investment is greater than saving and, therefore, any displacement of the economy to the left will unleash forces tending to restore it to the position c. To the right of its savings are greater than investment therefore the economy cannot go beyond this point. Any shift to the right will make savings more than investment and the economy, consequently, will tend to come back to the position c.

During the course of reaching the position c from the position a, the economy increases its capital stock on account of which the investment function will now shift down to a position like I (Y). This downward shift may be encouraged due to rising cost and falling off of consumption. The economy now comes into the position d which, in fact, is the upper turning point of the business cycle. The point d is not a point of stable equilibrium, because to the right of it as well as to the left of its savings are greater than investment. Hence, the level of income will go on falling till once again the low depression-level stable equilibrium is attained at a point like a in Fig. 14.1. It should be noted that in the above representation of Kaldor's model we have assumed the saving function to be linear only for the sake of simplicity. Actually, even the saving function in Kaldor's model is non-linear. However, introducing non-linear saving function does not change the conclusions.

14.7.2 The Multiplier-Accelerator Interaction Model:

Keynes, in his income analysis, had worked with the multiplier alone. The principle of acceleration did not enter into his analysis at all. The Keynesian theory of the business cycle explains the cyclical fluctuations in terms of the shifts of the investment function caused by the shifts in the MEC schedule which in turn, might be the result of change in expectations or of both factors. Once investment changes due to a shift of MEC schedule and, in consequence of it. Of the investment function, the principle of the multiplier is relied upon to explain the subsequent change in income. However, it should be obvious that it presents too simplistic, an explanation of fluctuations of income. For one thing, it completely ignores the effect of change in income no investment. Due to the neglect of this factor or, to put it otherwise, due to the failure to recognise the acceleration effect, the Keynesian analysis assumed much greater stability of a free market economic system than there actually is. On the other hand, if we allow only for the principle of acceleration and neglect the multiplier effect, the system shows a much greater instability than the actually is.

It was Samuelson who, first of all, synthesised the two principles following a suggestion from Hansen. In his now classic paper, "In teraction Between the Multiplier Analysis and the Principle of Acceleration," published in 1939, Samuelson explained the interaction of the multiplier and the principle of acceleration from which he demonstrated that a free-market economic system can cause endogenously business cycles of various types.

We shall explain hereunder the essentials of this model.

National income of an economy at any given time t is:

(1) $Y_t = G_t + C_t + I_t$

G_t is government expenditure is period t and Y_t, C_t I_t are income, consumption and investment of the and period t.

(2) $C_t = aY_{t-1}$

where a is the marginal propensity to consume the income of the previous period.

(3) $I_1 = \beta\ (C_t - C_{t-1})$

Where β is the coefficient of acceleration or the capital-output ratio.

Substituting (2) into (3) :

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

If we assume G_t to be Re. 1 and substitute (4) and (2) into (1) we have the basic equation of this model of which may be written as :

(5) $Y_t = 1 + \alpha\,(1+b)\, Y_{t-1} - \alpha\, \beta\, Y_{t-2}$

Let us now explain the model with the simple arithmetical example used by Samuleson himself. It shall be assumed that government is Re. 1 in the initial period 1 and that it is maintained in the subsequent periods too. The marginal propensity to consume (d) is assumed to be 0.5 and the value of accelerator (B) is assumed to be 2. It can be seen that due to the interaction of the multiplier and the accelerator, the income will fluctuate as follows:

Period	G_t	$C_t = ay_{t-1}$	$It = \beta\ C_t - C_{t-1})$	$Y_t = G_t + C_t + I^t$
1	1	0	0	1
2	1	50	1	2.50
3	1	1.25	1.50	3.75
4	1	1.875	1.250	4.125
5	1	2.0625	.3750	3.4375
6	1	1.71875	-.6875	2.0313
7	1	1.01565	-1.4062	.6094
8	1	.3047	-1.4218	-.1171
9	1	-.05855	-.7266	.2158

A look at the above table shows that any given injection into the economy by way of any autonomous increase in investment, which is also maintained subsequently, causes the income not to increase smoothly as suggested in the multiplier analysis but to make it fluctuate: it rises upto the 4th period, after which it starts falling till the ninth period when it begins to rise again.

It should be noted that the above model is a highly formal one representing an abstraction from reality. In actual life the income after a fall is likely to rise much sooner than what is indicated in the above model. The reason is that the above model does not recognise that there is a floor below which neither consumpiton nor investment can fall. Consumption cannot be even zero, not to speak of its becoming negative. Secondly, net investment can at worst be negative to the extent of the replacement only, for gross investment can at most be zero but not negative. However, when we recognise these facts, the essential feature of the above model is not undermined. The essential feature is that when multiplier and accelerator operate together, depending upon the values of the marginal propensity to consume and the accelerator, a constant level of autonomous investment will cause various types of cyclical fluctuations.

When the value of α (MPC) is 0.5 and that of β (accelerator) is zero, there is only the multiplier effect and hence no cyclical fluctuations. When the values of α and β are respectively .5 and If there would be damped cycles, that is, the amplitudes of expansion and contraction would go on decreasing till the fluctuations converage into a new equilibrium. When the values of α and β are respectively 0.5 and 2, as in the above arithmetical example, there are continuous cyclical fluctuations with unchanged amplitudes of expansion and contraction. When the values of α and β prospectively 0.6 α and β 2 there are explosive cycles that is, the amplitudes of expansion and contraction go on increasing which underlines the dynamic instability of the system. And, if the values of α and β happen to be 3 and 4 respectively, there are no fluctuations but instead the income goes on increasing at an exponential (compound interest) rate. In the last case, an autonomous increase in investment will make the income go on increasing continuously at an exponential rate.

According to Samuelson, the whole field of possible values of α and β can be divided into four regions, each of which gives qualitatively different pattern of behaviour of national income through time. These four regions are represented in the diagram of Fig. 14.2 below.

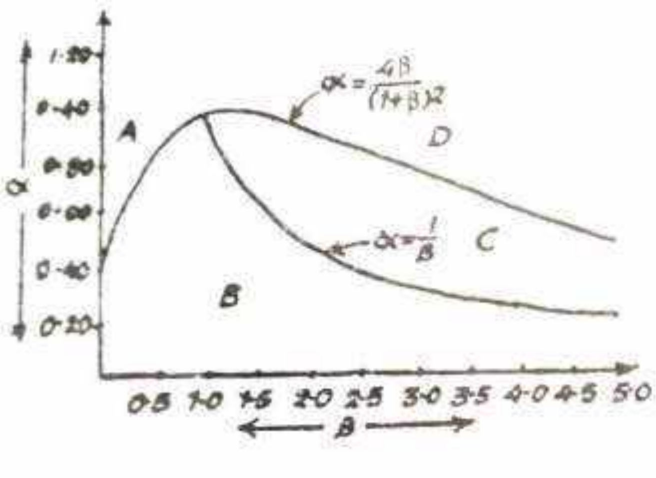


Fig. 14.2

Region A in Fig. 14.2 above is the region of relatively small value of β. If, for example at 0.5 and β is between zero and one, the y (income) will approach asymptotically a value $\frac{1}{1-\alpha}$ times the sustained autonomous injection of government expenditure. In other words, the values of α and β in this region will cause damped cycles as shown in Fig. 14.3. Region B in Fig. 14.2 above is a region of a relatively higher β such that αβ=1, for example, α = 0.5 and B=2. Such value of α and β that αβ=1 which lie in region B will yield a pattern of change in income overtime in which there are continuous fluctuations with unchanging amplitudes of expansion and contraction as shown in Fig. 14.4 above.

Region C in Fig. 14.2 is a region of relatively high values of both α and β. For example, the combination $\alpha = 0.6$ and $\beta = 2$ will lie here. These values of α and β will generate a pattern of income fluctuations in which the amplitude of fluctuations is continuously increasing as shown in Fig. 14.5 above. They cause explosive cycles which are the anti-thesis of the damped cycles of Fig. 14.3.

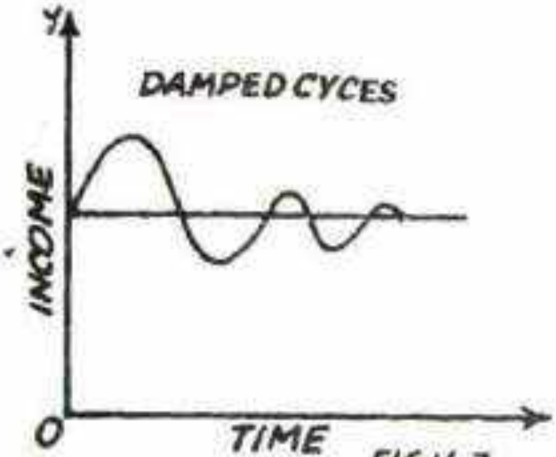


FIG 14.3

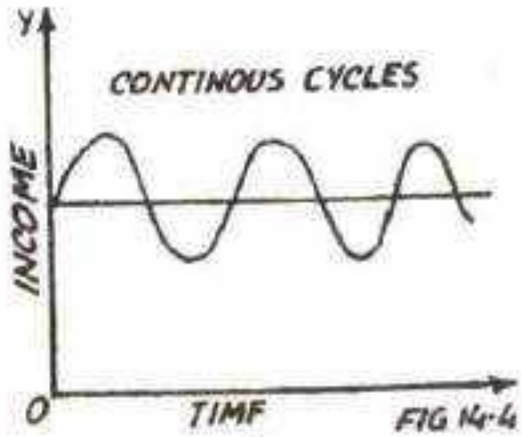


FIG 14.4

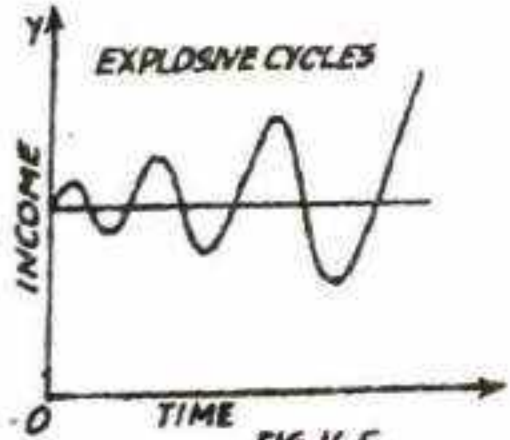


FIG. 14.5

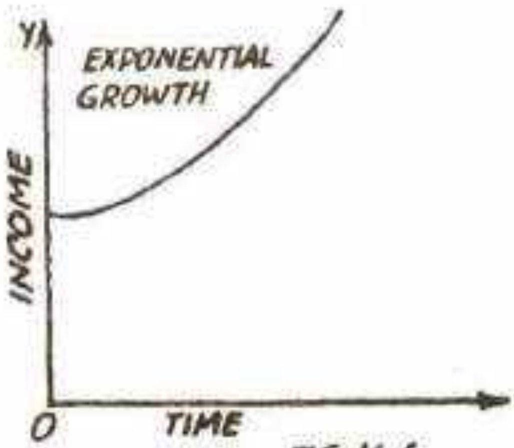


FIG. 14.6

Region D of 14.2 is a region of still higher values of α and β such that $\alpha = \frac{4\beta}{(1+\beta)^2}$ For example, the combination, $\alpha = 0.8$ and $\beta = 4$, will lie in this region. With such values of a and β a sustained autonomous injection of government expenditure will result in a time process of increasing income at an increasing rate showing continuous growth at an exponential rate as shown in Fig. 14.6 above. It is the case of smooth explosive growth without cyclical fluctuations.

The above is only a simplified picture of what can be expected with regard to the time-pattern of the behaviour of income, when the multiplier and the principle of accelearator are working together. The real world is too complicated where much more factors than merely multiplier and accelerator would be acting and interacting and therefore the real-world business cycles may not conform strictly to these patterns. Moreover, the principle of accelerator will not work in teal life as machanically as it assumed in theory. Besides, we also know from the theory of the accelerator that this principle does not work in the downward direction in the same manner as it works in the upward direction because gross investment can be zero but not negative and the net investment cannot be negative by more than the value of depreciation. In addition, the basic assumption of the model that the marginal propensity to consume (α and the capital output ratio or the accelerator (β) remain constant throughout the analysis may not correspond to reality. But, in spite of these limitations, the multiplier-accelerator inter-action model has great importance as it highlights the endogenous character of business cycles.

Self Check Exercise-5

Q1. Discuss the Kaldor's model of Business cycles

Q.2. Discuss the Multiple- Acceleration Interection model of Business cycles.

14.8 Summary

An important feature of the working of a capitalist economy is the existence of alternating Periods of Prosperity and depression generally referred to as 'business cycles'. A business cycle is a very complex economic phenomenon and the economists have not been able so far to discover any comprehensive explanation for this phenomenon. The business cycle is associated with sweeping fluctuations in economic activity, such as, production, prices, employment etc.

14.9 Glossary

The business cycle in short is an alternate expansion and contraction in overall business activity as evidenced by fluctuations in measures of aggregate economic activity such as the gross product the index of industrial production and employment and also income.

General speaking, the cyclical fluctuations have a tendency to wards simultaneous appearance in all the branches of the national economy. But sometimes they may be confined only to individual industries or individual sectors of the economy. Cyclical Fluctuations in such cases are referred to as specific cycles.

14.10 Answers to Self Check Exercises

Self Check exercise -1

Ans.1. Refer to Section 14.3

Self Check exercise -2

Ans.1. Refer to Section 14.4

Self Check exercise -3

Ans.1. Refer to Section 14.5

Self Check exercise -4

Ans.1. Refer to Section 14.6

Self Check exercise -5

Ans.1. Refer to Section 14.7.1

Ans.2. Refer to Section 14.7.2

14.11 SUGGESTED READINGS

1. E. Shapiro, Macroeconomic Analysis, Ch. 19,
2. N. Kalor, "A Model of the Trade Cycle" in his Essays on Economic Stability and Growth.
3. Paul Samuleson, Paul Samuleson, "Interaction Between the Multiplier and the Principle of Acceleration" in Haberler (ed.) Readings in Business Cycle Theory.

14.12 Terminal Questions

1. Explain Kaldor's model of the Trade Cycle.
2. Explain Samuelson's Multiplier-Accelerator Interaction model of business cycles. What is its importance?

*****

Unit-15

BUSINESS CYCLES (2)

STRUCTURE

15.1 Introduction

We considered, in the preceding lesson, one particular version of the multiplier-accelerator interaction model of business cycles the model which was propounded by Paul Samuelson. We has occasion to remark there that Samuelson's model is, in many respects, an abstraction from reality. Its value lies in highlighting the forces of the multiplier and the accelerator which, under certain conditions, are capable of causing self-generating cycles. However, it also admitted that when the values of both, the multiplier and accelerator, are high- i.e., when the value of the marginal propensity to consume (a) and the value of the accelerator (B) in Samuelson's model explained in the preceding lesson are such that $\alpha = \frac{4\beta}{(1+\beta)^2}$, there will be no cyclical fluctuatins in investment and income but there will be smooth and 'explosive' growth and the direction of change in investment and income will never be reversed. This implies that Samuelson's model of the business cycle will be valid only when the coefficients of *mpc* (a) and the accelerator (B) are so small that $\alpha = \frac{4\beta}{(1+\beta)^2}$ In other words, it is applicable only to the case of what Hicks has described as the 'free' cycles or the 'weak' cycles the cycles in the course of which movement in one particular direction is reversed on its own without being compelled to do so due to some constraint' in the system. Such a 'constraint', which might the form of a "ceiling" or a "floor" is also. known as a "buffer". As a ball rebounds after hitting the ceiling or the floor and thus reverses the direction of its movement, even so can an economic system reverse the course of its economic activity after hitting a "ceiling" or a "floor". Cycles which are caused by such constraints have been described by Hicks as the constrained" cycles. While Samuelson's multiplier-accelerator interaction model fits in with the "free cycles", for this model does not incorporate the concepts of the "ceiling" and the "floor". Hicks's model, which is also a form of multiplier-accelerator interaction model of the business cycle, is a model of "constrained" cycles, though this is not the only difference between the two models. We shall now explain Hicks's model of business cycle which will automatically bring out the essential points of difference between his model and Samuelson's model.

15.2 Learning Objectives :-

After going through this chapter you will be able

- To understand the different phases of business cycles
- To understand Hicks Model

15.3 Hicks's Model :

Like Samuelson, Hicks also assumes a lagged consumption function; that is to say, he assumes that consumption of the current period depends on the income earned in the previous period so that C_t (Y_{t-1}). For the sake of simplicity we may = assume that there is no autonomous consumption. The consumption function will, then, correspond to the long-run form of it which starts from the origin and can be written in the lagged form as follows :

(I) $C_r = cY_{t-1}$

It is obvious that the value of the marginal propensity to consume e will determine the coefficient of the multiplier effect in response to a change in investment.

Hicks's investment function also incorporates the principle of accelerator like the investment function of Samuelson. But, there is a slight difference between the two. Samuelson assumes that investment in any given period of time is a function of the change in the demand for consumption goods in that period so that, in his model. $I_t = f\ (\Delta\ C_t)$ and has the specific form : $I_t = \beta\ (C_t - C_{t-1})$. But, Hicks assumes that investment depends on not only the change in the demand for capital goods but also the change in the demand for consumption goods. His assumption is, obviously, more broad based as well as nearer to the reality. It is because the increased demand for capital goods has also to be met by additional net investment. Therefore, in Hicks's model, investment is made to depend on the change in the demand for total output. (ΔY) rather than on a mere part of it that consists of change in the demand for consumption goods only. Thus, in Hicks's moedl $I=f\ (\Delta Y)$. Moreover, Hicks assumes that this function too is a lagged one ; that is, investment in a given period is assumed to depend on the change in total output that takes place in the previous period so that $I_t = f\ (Y_{t-1})$. The specific form of Hicks's investment function is as follows:

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

But here it is assumed that there is no autonomous investment or we can say that the I in the above equation refers to the induced investment only. However, we should introduce outonomous investment also, because as we shall soon see it, outonomous investment, along with induced investment, is an essential element in Hicks's model as expounded in his book. A Contribution to the *Theory of the Trade Cycle*. With autonomous investment, his investment function will have the following form :

(3) $I_t = A_t + \nu \ (Y_{t-1} - Y_{t-2})$

Where I_t refers to total investment, inclusive of the autonomous as well as the induced investment, that takes place in period t. A_t is the autonomous investment; v is the coefficient of accelerator and is the same as Samuelson's β and equals the capital-output ratio. As in the simple accelerator model, discussed in one of the earlier lessons and the model of Samuelson, the capital-output ratio or the accelerator is assumed to be uniform throughout .v $(Y_{t-1} - Y_{t-2})$ is the induced investment of period t.

If we substitute equations (1) and (3) into the following accounting equation (4)

(4) $Y_t = C_t + 1$

We have

(5) $Y_t = cY_{t-1} + v\ (Y_{t-1} - Y_{t-2}) + A_t$

Rearranging (5), we have

(6) $(c + v)\ Y_{t-1} - vY_{t-2} + A_t$

Equation (6) is a second-order difference equation of the type we came across in Samuelson's model in the form :

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

It can be seen that there is only a very slight difference between Samuelson's model as depicted in equation (7) and Hicks's model as depicted in equation (6). If At is assumed to be unity, as in Samuelson's model, and we remember that Hicks's c and Samuelson's α. on the one hand, and Hicks's ν and β. on the other are the same because they refer to the same parameters (c and a, both, refer to the marginal propensity to consume while both of ν and β refer to the accelerator which, in both the models, equals the capital-output ratio), the only difference noticed is that coefficients of Y_{t-1} and Y_{t-2} in Samuelson's model are somewhat less than those in Hicks's Model, because $a + a\ \beta < c + \nu$ and $a\ \beta < \nu$, as $a=c$, $\beta = \nu$ and $\alpha < 1$. This difference is the result of the difference in the forms of the investment function employed in the two models.

Now, what is the significance of the second-order difference equation in this context ? In the first place, a difference equation states that the value of a variable in any given period is a function of its own value in the previous period or periods. When it is a second-order difference equation of thé type (6) or (7), it states that the value of the given variable in any period is determined by its own values in the previous periods r-1 and r-2, which should be obvious from (6) and (7) above. Now, we see that Y_{t-1} has a positive algebraic sign while Y has a negative algebraic sign before it. which implies that the value of Y in period t-I tends to enhance and the value of Y in period t-2 tends to decrease the value of Y in period t. This suggests the possibility that given certain values of the parameters (c and v Hicks's model and a and β in Samuelson's model), the income of the system (Y) will fluctuate. The general rule is that cyclical fluctuations will take place in the value of Y, if $b^2 < 4c$, where b is the coefficient of Y_{t-1} and c is the coefficient of Y_{t-2} in the second-order difference equation of the type, $Y_t - bY_{t-1} + cy_{t-2}$ = constant. The equation (6) above, summing up Hicks's model is of this type, for it can be written as follows.

(8) $Y_{t-} (c + v) Y_{t-1} + vY_{t-2} = A_t$

In terms of Hicks's model as depicted in (8) cyclical fluctuations will take place, if $(c+v)^2 < 4v$. Supposing c=1 and v=1, the said condition will not be satisfied and, thus, there will be no cyclical fluctuations but explosive exponential growth. However; c is normally less than unity.

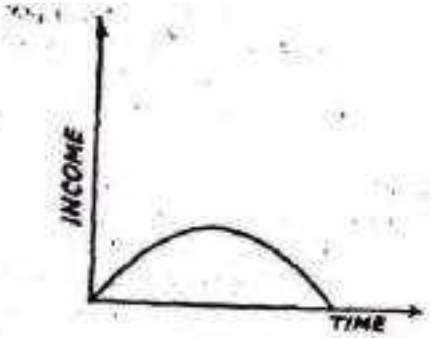


Fig. 15.1

Non-oscillatory Stable Equilibrium

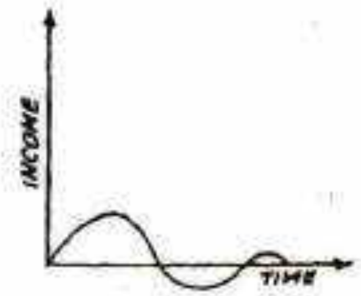


Fig. 15.2

Oscillatory Stable Equilibrium or Damped Cycles

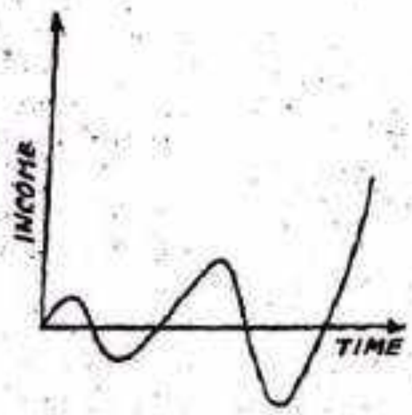


Fig. 15.3

Case (3)

Oscillatory Unstable Equilibrium or Anti-damped or librium or Anti-damped or 'Explosive' Cycles

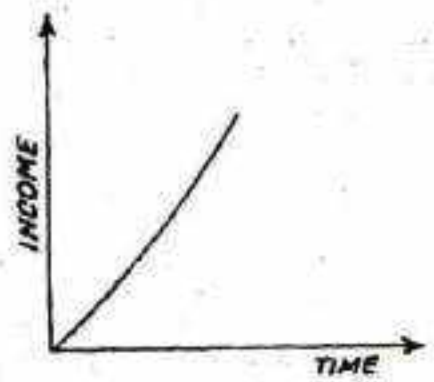


Fig. 15.4

Case (4)

Non-oscillatory Unstable Equilibrium or "Explosive" Growth

If $v \geq I$ such that $c + v < 2$, cyclical fluctuations will take place. The model visualises four possibilities with regard to the pattern of change income, if a once-for-all exogenous shock is given to the system in the form of, say, a once-for-all increase in autonomous, investment (A). These four possibilities are (i) The income goes on increasing smoothly for some periods till there is a downturn in it and the system ultimately comes to rest in the original state of stationary equilibrium. (ii) The income goes on increasing for some time till there is a downturn, but, on its downward course, it overshoots the equilibrium position; there is, again, an upturn in it and an overshooting; thus the income oscillates about the equilibrium level, but these oscillations have diminishing amplitude, and are, therefore, damped; consequently, the system finds its equilibrium again and the cyclical fluctuations die out., (iii) The income behaves as in the second case but with this difference that the oscillations now have increasing amplitude so that, the cyclical fluctuations become explosive and the cycle does not die out. (iv) The income goes on increasing smoothly without any reversal and thus ruling out cyclical fluctuations. The first case will occur, if $v<(1-\sqrt{s})^2$. The second case will occur, if $v>(1-\sqrt{s})^2<l$. The third case will occur, if $v =>l< (1 +\sqrt{s})^2$. The fourth case will occur, when $v> (1+\sqrt{s})^2$. The s referred to here is the marginal propensity to save and is thus equal to (1-c), c being the marginal propensity to consume.

So far, Hicks's analysis is similar to Samuelson's as far as the conclusions are concerned except for the fact that Samuelson considered and analysed patterns of change in income, when a given increase in autonomous investment is maintained in the susequent periods also. While Hicks has considered the effects of a one-time increase in autonomous investment so that, in the subsequent periods, the autonomous investment falls back to its original level.

The above four cases of the pattern of the time path of change in income have been depicted in the following diagrams :

The above diagrams have been drawn such that the original equilibrium level of income is represented at the origin.

A special feature of Hicks's model is that it seeks to explain the cyclical fluctuations against the background of the trend or the long-run growth of the system. Hicks tackles this problem by letting the autonomous investment grow over time. As the autonomous investment grows over time, the equilibrium level of income also rises over time as shown in the following figure :

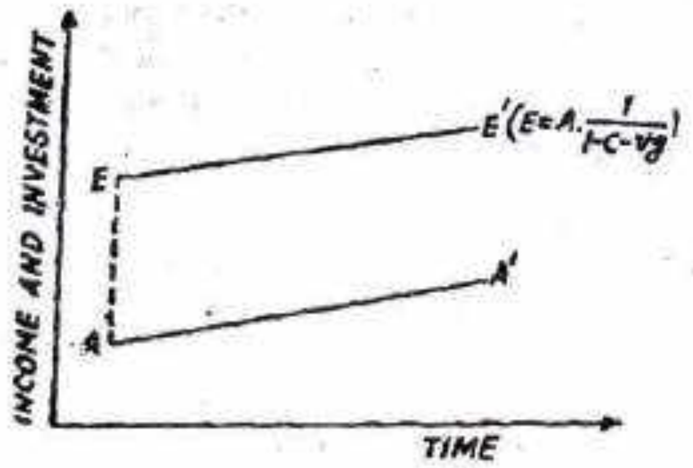


Fig. 15.5

The rising A A line in Fig. 15.5 above shows the long-run trend of autonomous investment. It is supposed to increase at a constant rate equaling the slope of the line AA. The E E line shows the time-path of equilibrium level of income and it is derived by applying the super-multiplier' formula to the autonomous investment. This equilibrium level of income will change at the same rate at which autonomous investment changes over time, for equilibrium level of income (E) is autonomous investment (A) multiplied by the coefficient of the 'super-multiplier' which, in this case of progressive equilibrium as distinguished from the simple case of stationary equilibrium, is $\frac{1}{1-c-vg.}$ all elements of which, such as c, v and g are assumed to be constant over time. That is why EE' line is drawn parallel to the AA' line EE' is said to be the equilibrium growth path and is analogous to Harrod's "warranted" growth path.

Now, the question is whether the introduction of growth makes any difference with regard to the possibility of cyclical fluctuations. Hicks has demonstrated that it makes no difference to this possibility, though it does reduce the degree of instability of the system. The sum and substance of his argument on this problem is as follows:

Equation (6) above may be rearranged and rewritten as follows :

(9) $Y_t = (1 + s + v). Y_{t-1} - vY_{t-2} + A_t$ $(1-s+v)$ $Y_{t-1} - vY_{t-2} + A_t$

Where S is marginal propensity to save and, therefore, c being the marginal propensity to consume, equals (1-c).

Equation (9) shows the relation of actual income in any period t to the actual income in the previous periods under the assumptions made in this model and specified in the beginning of this exposition of this model. A similar relation for equilibrium level of income, when autonomous investment is increasing over time, will have the following form :

(10) $E_t = (1\text{-}s+v)\ E_{t-1} - vE_{t-2} + A_t$

Where E_t stands for equilibrium income in period t : Subtracting (10) from (9) :

(11) $Y_t - E_t = (I\text{-}s+v)\ (y_{t-1} — E_{t-1}) + v\ (Y_{t-1} — E_{t-2})$

Let Y-E, that is, the deviation of the actual income from equilibrium income, be denoted by y. Then equation (11) will be rewritten as follows :

(12) $yt = (1\text{-}s+v)y_{t-1} - vy_{t-2}$

Which is also a second-order difference equation having implications similar to those of the equation (6) of the basic model. The conditions for stability or instability remain the same regardless of the trend or the growth factor.

It is possible that in a progressive system, the absolute deviation of actual income from equilibrium income (y) may tend to increase, giving rise to 'explosive' fluctuations in respect of absolute deviation. But, since in such a system equilibrium income will also be rising steadily, the relative deviation, r, may be tending to diminish, giving rise to only damped fluctuations in repsect of the relative deviation. It is because in a progressive system.

(13) $E_t = E_0\ (1+g)\ _t$, where g is the growth rate and E_0 is the equilibrium income in the initial period the absolute deviation in period t. i. e.

(14) $Y_t = r_t\ E_t$

Where r_t is the relative deviation of actual income from the equilibrium income in period t, the relative deviation being defined as the excess or shortfall of actual income as a proportion of equilibrium income i.e. r = $\frac{y}{E}$

From (13) an (14) :

(15) $y_t = E_0\ [1 + gl^t$

Substituting (15) into (12) :

(16 $r_t\ E_0\ (1+g)^t = (1\text{-}s+v)\ r_{t-1}\ E_0\ (1 + g)_{t-1}$

$vr_{t-2}\ E_0\ (1+g)^{t-2}$

Dividing bith sides of (16) by $E_0\ (1+g)^t$:

(17) $r_t = \frac{1-s+v}{1+g} r_{t-1} - \frac{v}{(1+g)^2} r_{t-2}$

Which again is a second-order difference equation chewing the same possibilities with regard to cyclical fluctuations as he equations (6) and (12). However, in this case, the critical value of v about which fluctuations become "explosive," is $(1+g)^2$ while in the earlier cases it was v=1. Since g is positive, the relative deviations will start fluctuating "explosively" when the capital-putput ratio, that is, the value of v is substantially above unity. This implies that the progressive system is less unstable or more unstable in terms of the relative deviations than in terms of the absolute deviations of the actual income from the equilibrium income. There is no other difference made to the basic model.

Self Check Exercise-1

Q1. Discuss the Hicks's model of Business cycles

15.4 Choice of Appropriate Value

The next question posed by Hicks relates to the choice of appropriate of v so that a model of the trade cycle based on this value of v correspon ds in its essentials to the real world trade cycles. A basic feature of this phenomenon has been that the cycles have been occurring with a fair degree of regularity in the capa talist economies. This implies, on the face of it, that the value of v cannot be so high as to rule out cyclical fluctuations. Secondly, the real-world cycles have not tended to be anti-damped or "explosive" cycles. This would make us expect the value of v to be still lower. But, if we adopt a very low value of v, that is, less than one, it may not only not correspond to the observed value of v but will also make only damped cycles to materialise. The damped cycles, as illustrated in Fig. 15.2 die out ultimately, while the real-world cycle has not died out. It leaves us with only another theoretical possibility and this is that the value of v may be such that it causes regular or continuous cycles with unchanging amplitudes as shown in Fig. 15.6 below.

In Fig. 15.6 a regular or continuous cycle has been drawn against the tend or growth line EE'. This type of cycle shows continuous fluctuations of unchanging amplitude about the dynamic equilibrium growth path EE'. Such a cycle, indeed, will not die out and, therefore, it seems to come very near to the real-world cycle. But the difficulty here is that such a cycle will require according to Hicks, a special value of v which must remain constaint throughout. Under the assumptions made in Hicks's basic model, this value of v must remain constant. Hicks rejects this possibility, for, as he observes, "it would be an extraordinary thing if we lived in a world which has got stuck for two centuries with an investment coefficient which was always equal his precise value !"

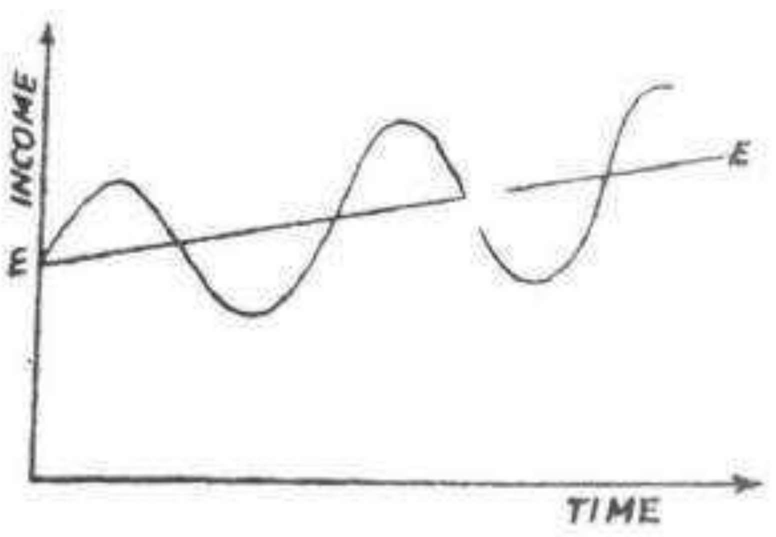


Fig. 15.6

We are thus really in a quandary, for, have we not, during the course of the argument, ruled out all the possibilities of a kind of cycle which is theoretically possible and is, at the same time, a prototype of the real-world cycle that has shown regular fluctuations and, moreover, has not died out ? One proposition put forward to over dilemma is the hypothesis of a damped cycle which is kept alive by "erratic shocks". This is the line of thought which was propagated by the Swedish economist, Ragnor Frisch, in his celebrated article. "Propogation Problems and Impulse Problems in Dynamic Economics", published in 1933 in Economic Essays in Honour of Gustav Cassel. The argument in this line of thought suggests that the values of v and c are such that a single once-over disturbance will cause only damped fluctuations, but, before the effct casued by the original disturbance is exhausted and the cycles caused by it peter out, fresh disturbances follow causing new fluctuations before the old have died out. Hicks has found this line of reasoning too as unacceptable, firstly, because, if the value of v is such that it is slightly below the special value of it which will cause regular cycles discussed in the preceding paragraph, a single once-over disturbance is able to convert an originally damped cycle into a regular continuous cycle, and,, secondly, because, if the value of v is substantially lower than the special value of it which engenders regular continuous cycles the cyclical fluctuations caused by the first disturbance are likely to exhaust their force rather too soon and the current income level will be affected substantially by the recent "shocks" with the effects of the earlier "shocks" being damped out.

So we are back at the square one. What is to be done, then? Hicks has advanced the proportion that the value of v and c in real life are sufficiently high to enable the interaction between the multiplier (whose force depends on the marginal propensity to consume, (c) and the accelerator (whose force depends on the captial-output ratio or the investment coefficient, v, as Hicks describes it) to cause either "explosive" cycles of the type illustrated in Fig. 15.3 above or "explosive" growth of the type illustrated in Fig. 15.4 above. But its "explosive" consequences are checked due to the existence of "buffers" in the system-the higher "buffer" in the form of the "ceiling" and the lower "buffer" in. the form of the "floor". The introduction of these buffers, as it was observed in the very beginning of this lesson, is a special feature of Hicks's model of the business cycle. The regularity of cyclical fluctuations in his model is caused by these buffers under whose impact the cycle is constrained to reverse its direction regularly such that the fall in income during depressions is, more or less, equal to the rise in income during the booms, as compared to the equilibrium level of income. In view of it, his mdoel is a model of the "constrained" cycles rather than of "free" cycles.

By now, we are in possessions of all the different parts of analysis of which Hicks's model of the business cycle is made. We have now simply to put together these pieces in order to have an integrated view of the structure of this model which has is geometrical illustration in Fig. 15.7 above.

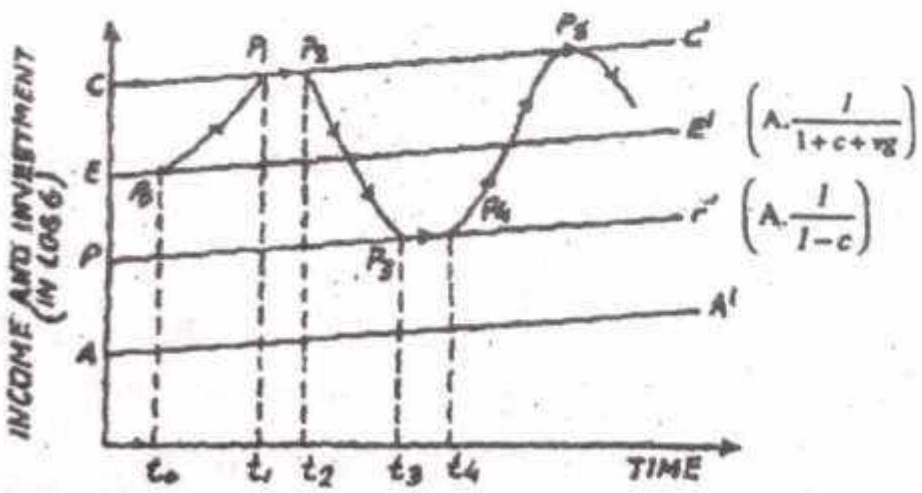


Fig. 15.7

In Fig. 15.7 time is measured along the horizontal -axis and the vertical axis measures income and investment on a logarithmic scale. AA' shows the time path of autonomous investment (A) which, in Hicks's own words, comprises "Public investment, investment which occurs in direct response to inventions, and much of the 'long-range' investment..................which is only expected to pay for itself over a long period......." In a growing economy it has a positive slope equalling the growth rate (g). It is assumed to grow over time at a constant rate hence it is shown by a straight line AA'. If the whole of investment consists of autonomous investment alone and so there is no induced investment, equilibrium income of the system will grow along a line like FF' which is derived by applying the multiplier formula. This income will grow at the same rate at which autonomous investment is growing, for the assumption is that marginal propensity to consume (c) remains constant and, hence, the multiplier is also constant. When there is depression and the accelerator stops working, there is only autonomous investment taking place. Hence, during depressions the actual income, moves along the line FF. Due to certain factors, such as the break-even point between income and consumption and non-negativity of gross investment, there is a minimum level below which income cannot fall even in the worst of depressions. This minimum level below which income cannot fall is called the "floor" by Hicks and is represented in our diagram by the FF line. In a growing economy, this 'floor' too has an upward slope, for, on account of the growth factor, this minimum also rises over time. Here it is assumed to grow at the same rate as the autonomous investment.

However, when there are both types of investment, the autonomous as well as the induced, the equilibrium level of income will grow over time along the EE' line in Fig. 15.7. As already explained, this line EE is derived by applying the "super-multiplier" to the autonomous investment growing along AA".

It is reasonable to suppose that at any given time, the productive resources of an economy have a maximum limit and technology is constant. Therefore, at any given time, there is a maximum limit upto which the income of the system can rise. Hicks calls it the "ceiling". However, over time, this maximum income potential goes on increasing due to growth in resources, such as population, and technological progress. Therefore, the so-called "ceiling" is also an upward rising "ceiling" as shown by the line CC in our Fig. 4. This is also assumed to grow at the same constant rate at which the other variables referred to above are growing. That is why all these variables have parallel time paths of change.

The "ceiling" CC is the upper "buffer" blocking the upward thrust of income beyond it and the "floor" FF is the lower "buffer" blocking the downward plunge of the income below it.

Now, let us suppose that the system has been in a state of dynamic or progressive equilibrium till it arrives at P_o along the equilibrium path at time t_o. At this time t_o we suppose that there is a sudden, though once-over, spurt in autonomous investment. This "shock" will jolt the system away from the equilibrium growth path EE'. Since the values of the multiplier and the accelerator $\left(\frac{1}{1-c} \textit{ and } v\right)$ assumed in Hicks's model are such that their interaction will set the system along an "explosive" path, therefore the income rises along the steep path P_op_1 till, at time t_1, it hits the "ceili--". After this, the income can rise at the most along the "ceiling". But it can be seen that the "ceiling" is rising at a lower rate than the rate at which the actual income had been increasing between t_o and t_1. This implies that the rate of increase in income is bound to decline after t_1. We know it from the theory of the principle of accelerator that when the rate of increase in income begins to fall, there is a fall in induced investment. A fall in investment reduces income due to the multiplier effect. The fall in income further reduces the induced investment due to the working of the acceleration principle. Thus, there is now a cumulative or "explosive" fall in income till it hits the "floor" at p_3 along FF in period t_3. This is the onset of the depression phase of the cycle. The course of income from p_2 to p_3 during the time period t_2-t_3 represents the phase of the cumulative contraction or the downswing. When the income of the system hits the "floor" at P_3 induced investment becomes zero and may become even negative but by not more than the depreciation, for the enterpreneurs can, at the most, neglect replacement of the depreciated capital stock. But some autonomous investment may still be taking place so that actual income, which cannot fall below the "floor", will move along the "floor". But, sooner or later, the demand for replacement of investment is bound to a rise. In addition, the replacement of machines newly installed during the expansionary phase extending from p_0 to p_2 might also fall due. Due to these endogenous factors, the investment is bound to pick up after some time. As soon as this happens the multiplier will come into operation and the rate of increase in income will rise. At this stage, the accelerator also comes into operation and there is further increase in induced investment. Thus the recovery which starts at time f_4 passes into a new phase of cumulative expansion and the cyclical process is repeated regularly.

Self Check Exercise-2

Q1. Discuss the choice of Appropriate Value.

Choice of Appropriate Value

15.5 Summary

Hicks's model has been acclaimed as an ingenious piece of work by Duesenberry, Kaldor, though not quite satisfied with it, found in it "many brilliant and original pieces of analysis". But, in spite of its ingenuity, originality and brilliant analysis, the fact remains that it presents too simplified a picture of the business cycle. The real world business cycle is, indeed, a much more complicated phenomenon. It involves many more factors other than those touched upon in his model. The value of the model lies in its explanation of the turning points which are shown to come about due to the existence of "buffers". The model, as presented above, suffers from certain drawbacks. For one thing, the monetary factors are not taken note of in the exposition of the model as given above. Another charge against this model is that it relies on the mechanical accelerator which is based on the unrealistic assumption of a constant capital-output ratio. The model also ignores the effect of the growth of real output on the "ceiling", for the latter is assumed to be independent of the former. This assumption is unwarranted, for, as output grows, the stock of capital, grows which is bound to affect the "ceiling". However, when all is said and done, Hicks's model remains an important landmark in the theory of the business cycles.

15.6 Glossary

J.R. Hicks buids his theory of trade cycles around the principle of the multiplier-accelerator interaction. To win, "the theory of the acceleration and the theory of the multiplier are the two sides of the theory of fluctuations, Just as the theory of demand and the theory of supply are the two sides of the theory of value." Hicks model is concerned with the problem of growth and of a moving equilibrium.

The Ingredients of Hick's model of trade cycle are the warranted rate of growth, the consumption function, auto nomous investment; an induced investment function and the multiplier-accelerator relation. The warranted rate of growth is the rate which will sustain itself. It is consistent with saving investment equilibrium. The economy is said to be growing at the warranted rate when real investment and real saving are taking place at the same rate.

According to Hicks, It is the multiplier accelerator interaction which weaves the path of economic fluctuations around the warranted growth rate.

15.7 Answers to Self Check Exercises

Self Check exercise -1

Ans.1. Refer to Section 15.3

Self Check exercise -2

Ans.1. Refer to Section 15.4

15.8 References/ SUGGESTED READINGS

1. **J.R. Hicks,** A Contribution to the Theory of the Trade Cycle Ch. VI to VIII.
2. Dernberg and Mc Dougall Macroeconomics, Ch. 17 Fourth Edition.
3. E. Shapiro, Macroeconomic Analysis, Ch. 19

15.9 TERMINAL QUESTIONS

1. Explain Hicks's model of the trade cycle.
2. Bring out the similarities and differences between Hicks's model of the trade cycle and Samuelson's model.

****

Unit-16

GROWTH MODELS (1)

STRUCTURE

16.1 INTRODUCTION

We had been till now discussing various aspects of macroeconomic theory which may well be described as the short-run problems of macro-economic theory. The major problems discussed so far had been related to such questions as what determines the level of utilisation of the existing productive capacity of an economy and, if this capacity is not fully utilised, what can be done in order to employ this productive capacity fully. While discussing business cycles we were already on the borderline of the short-run and the long-run macro economics, for, as is quite obvious, the expansionary phase of a cycle is a period during which the productive capacity of the economy does not remain static. But the perspective and framework of the business cycle theory is, on the whole, a short-run perspective and framework. The field that we are entering now is related to the long run. The problems of the long run are too important to be dispensed with Keynes's rhetorical quip that "in the long run we are all dead". In the long run, each one of us may be dead individually, but as a community we live on and plan for the long run too.

We can say that a community has two fundamental long-run problems to deal with. One of these problems is, in fact, the problem which, first of all, attracted the attention of economic thinkers. In brief, it is the problem of growth. Economics, as is evident from the writings of economists like Adam Smith and Ricardo, started as a theory of economic growth which is concerned with an enquiry into the nature and causes of economic growth of nations. In the present and the next lesson we shall not be concerned with this particular problem of the growth theory. Our concern in these two lessons will be with the other problem related to the long-run growth which was, first of all, highlighted by Harrod in his paper, "An Essay on Dynamic theory", published in 1939. This problem is the problem of finding out the conditions of steady growth.

16.2 Learning Objectives :-

After going through this chapter you will be able

- To know Steady State growth
- To know Harrod's Model and Steady State Growth.
- To understand Domar's Model.

16.3 Steady State Growth

Steady state growth may be defined as that type of growth of an economy which is not afflicted on the way with fluctuations. When an economy is following the path of steady growth, it is in equilibrium from moment to moment and its equilibrium at any given moment differs from its equilibrium at any other moment only in the matter of scale. Thus the steady state growth traces such a path over time that, while some of the relations may remain constant over time, the relevant variables involved increase over time exponentially giving no chance of ups and downs in their values. If you are able to recall what you learnt from the earlier lessons on the theory of one business cycle, you should be able to recognise the steady state growth is a type of unidirectional or monotonic change.

It may be said that in a steady state of growth of an economy, its output, population, capital stock, consumption and investment are all growing at the same exponential rate, while some relations such as the capital-output ratio and consumption-investment ratio may remain constant, though, as the neoclassical models indicate, the latter is not a necessary condition of steady state growth under all circumstances. However, when these ratios remain constant and output of consumption goods as well as investment goods, population, capital stock, etc., are all growing over time at the same exponential rate, the growth of the different sectors of the economy will be in balance. Therefore, steady state growth is also sometimes referred to as balanced growth or equilibrium growth.

Self Check Exercise-1

Q1. What do you mean by steady state Growth?

16.4 Harrod's and Steady State Growth

As it was pointed out earlier in this lesson, Harrod was the first economist to raise the issue if there exists a path of steady state growth and, if it does, what are the conditions necessary to get along this path, and whether these conditions are practicably realisable.

It may be said that Harrod's model was the first attempt to apply the Keynesian tools of analysis to the solution of the long-run problems, Keynes's General Theory suffered from a serious flaw in that it assumed the productive capacity of the economy to be given and constant and, then, proceeded to analyse the conditions of full-employment equilibrium of the economy. Full employment of a given productive capacity requires a definite amount of investment (equal to the desired savings out of the full-employment level of income) to be undertaken per unit of time. By definition, positive net investment implies addition to the capital stock of the economy as a result of which its productive capacity increases. This capacity effect of investment was completely ignored by Keynes in his General Theory, because he was completely preoccupied with short-run problems and, therefore, he was able to take note of only the employment and income creating effect of investment, turning a blind eye to the capacity creating effect of investment.

The capacity creating effect of investment has important implications, if the full-employment equilibrium is to be maintained over time. The important implication is that if the growing productive capacity of a progressive economy is to be kept fully employed from period to period, the income and expenditure of the economy must also go on increasing over time at a rate which enables the economy to just attain this dynamic equilibrium and to keep along the time-path of steady state growth. Here, for the time being, we shall not make a distinction between the equilibrium path of growth and the full-employment equilibrium path of growth. We shall, therefore, assume both to be the same, for the sake of simplification.

Now the question is: At what rate should the income of an economy go on increasing over time, if the ever growing capacity of the economy is to be fully employed over time? This tantamount to a search for the conditions which are necessary for steady growth. Since one of the answers to this question is provided in Harrod's growth model. We shall now try to expound the main features of this model.

In order to understand Harrod's model, it is necessary to understand the meanings of, and the

distinction between, the three growth rates that have been mentioned in Harrod's model. These three growth rates are: the actual or the realised growth rate, the warranted growth rate and the natural growth rate.

Harrod assumes that the capital-output ratio or the accelerator which he denotes by the letter C is given and is cosntant, and so is the marginal propensity to save denoted by the letter s. Now, the capital-output ratio here means the amount of additional capital required to produce one additional unit of real income and can, therefore, be denoted by $\frac{\Delta K}{\Delta Y}$. But ΔK, by definition, is net investment. Capital stock can increase only when there is positive net investment. Therefore, the capital-output ratio can also be written as $\frac{1}{\Delta Y}$. Thus we have the following relations:

(1) $C = \frac{1}{\Delta Y}$

or (2) $\Delta Y = \frac{1}{C}$ Where I is net investment, C is capital-output ratio and ΔY is increase in income.

(3) $Y = \frac{1}{s}$ is the multiplier relation, where I is net investment, Y is income and s is marginal propensity to save.

From (2) and (3), we have

(4) $\left(\frac{\Delta Y}{Y}\right)_w = \frac{1}{C} = \frac{s}{Y}$ or $G = \frac{s}{C}$

Equation (4) above expresses Harrod's actual growth rate, which tells us that, given the marginal propensity to save (s) and the capital-output ratio (C) as constants, the income of the economy will grow over time exponentially (at a geometric rate) at a rate equalling the ration between the marginal propensity to save and the capital-output ratio. Denoting this rate of growth by G, we may express the actual growth rate as G = $\frac{s}{C_r}$ $\frac{C_r}{s}\left(\frac{X_t - Y_{t-1}}{X_t}\right)$

It should not be out of place here to observe that this particular growth equation also tells us something about the determinants of growth rate. The two determinants of the growth rate hinted at in this growth equation are the propensity to save and the capital- output ratio. Given the capital-output ratio, the higher is the propensity to save, the higher will be the growth rate of an economy. Given the propensity to save, the lower is the capital-output ratio, the higher is the growth rate.

However, the linchpin of Harrod's model is the warranted growth rate, which is defined as that rate of growth "which is realized, if expected". (A.K. Sen). It is that rate of growth in income which is necessary for the full utilisation of the growing capital stock of the economy so that entrepreneurs' expectations are fulfilled and they are thus satisfied with the amount of investment actually made by them from period to period. But, how can we derive this warranted rate of growth?

We know it from the principle of acceleration that investment depends on the change in output. In the simple theory of the accelerator, it is implicity assumed that the past is the proper guide for the future and, therefore, if a certain increase in output and sales had been realised in the current period, it is assumed that the entrepreneurs believe that this particular increase will be maintained in the next period too. Only under this belief or expectation will the new investment be undertaken. Since investment done today will bear fruit only tomorrow, therefore it is more reasonable to assume that investment depends on the expected increase of income level of the previous period. Thus Harrod makes use of the Keynesian theory of investment, in a way. Let the expected level of income in period be denoted by X_t and the actual or realised income of the previous period t-1 be denoted by Y_{t-1}. Then, according to the principle of acceleration.

(5) $I_t = C_r (X_{t-1})$

where I_t is the investment which all the entre preneurs taken together undertake on the expectation that output and sales at the end of the period will increase to X_t. C_r is the required capital-output ratio.

If I_t is the investment and s is the marginal pro-pensity to save, we know it, then, from the theory of the multiplier that

(6) $Y_t = \frac{1_t}{s}$

Substituting (5) into (6),

(7) $Y_t = \frac{C_r}{s} (X_t - Y_{t-1})$

Dividing both sides of (7) by X_t.

(8) $\frac{Y_t}{X_t} = \frac{C_r}{s} \left(\frac{X_t - Y_{t-1}}{X_t} \right)$

The expression within brackets on the right-hand side of equation (8) is the expected rate of growth in output or income. Let us denote it with g. The equation (8), then, can be written as follows :

(9) $\frac{Y_t}{X_t} = \frac{C_r}{s} g$

Now expectations will be realised only if $Y_t = S_t$. In that case the left-hand side equation (9) will equal unity. It follows, then, that the expectations of the entrepreneurs will be realised if and only if the expected growth rate $g = \frac{s}{C_r}$, for as already pointed out, the capital-output ratio (C_t) and the marginal propensity to save (s) are assumed to be constant. This rate of growth which, when realised, fulfils the expectations of the entrepreneurs has been named the warranted rate of growth is taken to be the rate of growth which, if it occurs, will leave all parties satisfied that they have produced neither more nor less than the right amount." This will imply that every entrepreneur is satisfied with the amount of investment being done by him which further implies that the desired investment over time is equal to the desired savings over time otherwise the expectations of the entrepreneurs will not be fulfilled. Hence, Harrod's warranted growth rate may be written as follows"

(10) $G_W = \left(\frac{\Delta Y}{Y}\right)_w = \frac{s}{C_r}$

Now what is the difference between the growth equation (4) and the growth equation (10) ? The growth" rate in (4) refers to the actual growth rate and, therefore, this equation tells us no more than the familiar truism that ex post investment equals ex post savings, which can be demonstrated as follows : Equation (4) can be rewritten as

(11) GC = s

Since, by definition, G = $\frac{\Delta Y}{Y}$, C = $\frac{1}{\Delta Y}$ s = $\frac{s}{Y}$,

Equation (11) can be rewritten as follows:

(12) $\frac{\Delta Y}{Y} . \frac{1}{\Delta Y} s = \frac{S}{Y}$ which reduce to

(13) I=S, i.e. ex post investment equals ex post savings. But equation (10) implies the equality between the ex ante or desired investment and the ex ante or the desired savings as well as the equality between the desired or ex ante investment and the actual or the ex post investment as well as between the desired or ex ante savings and the actual or the ex post savings. It is because C, in (10) is the desired or required investment per unit of increase in income, while C in (4) is the actual investment done per unit of increase in income.

The warranted growth rate G_W is the equilibrium growth rate, If the actual growth rate G can be kept equal to G_W over time, the economy will remain on the equilibrium or the steady growth path over time unless it bumps against some "buffer" in the economic system. Thus we can say that the first necessary condition of steady growth is: G-G_W. i.e., the actual growth rate must equal the warranted growth rate. Thus, according to Harrod, steady state growth is possible but it is, at the same time, highly precarious. For a little deviation of the actual growth rate (G) from the warranted growth (G_W) will plunge the economy into either a downward spiral of falling incomes, consumption, savings, and prices or an upward spiral of rising incomes, consumption, savings and prices.

Suppose that the actual growth rate is greater than the warranted growth rate ($G>G_W$). This would imply that

(14) $\frac{s}{C} > \frac{s}{C_r}$

i.e. the actual investment being made per unit of increase in income is less than the investment required to keep the economy on the time-path of equilibrium growth. This follows from the above inequality (14). In other words, the capital stock of the economy will be growing at a smaller rate than the rate required for steady state growth of the economy. The stock of capital goods will be found, at every moment, to be less than required and, hence, the desired investment will exceed the actual investment. This will set up a cumulative process of rising incomes, consumption and prices and thus a situation of chronic inflation is caused. The economy moves farther and farther away from the dynamic equilibrium path.

On the other hand, if the actual growth rate is less than the warranted growth rate ($G<G_w$), this will imply the following inequality :

i.e, the actual investment being made is more than the investment required to keep the economy on the time-path of equilibrium of steady growth. In other words, the stock of capital goods will be growing at a rate greater than the demand or the required rate. Therefore, the entrepreneurs will tend to reduce their investment and the multiplier and the accelerator will interact to drag the economy headlong into a deflationary spiral of ever falling incomes, consumption, Investment and prices.

This is, indeed, a growth paradox that when the actual growth rate is too high so that $G > G_w$. it is found that enough is not being produced, and, when the actual growth rate is rather too small so that $G < G_w$. it is discovered that too much is being produced. However, the paradoox is solved as soon as we consider the effect of the situation on the demand side also. If $G > G_w$ output no doubt, rises but the demand rises even more due to the multiplier and the accelerator of effects. To use the language made familiar in the business cycle theory we can say that Harrod assumes such values of the multiplier and the accelerator that once the economy moves a little away from the equilibrium path, it never reverses its course. Due to this, the situation $G > G_w$ creates a situation of chronic excess demand, and the situation $G < G_w$ leads to a situation of chronic deficiency of demand.

Since, in Harrod's model, deviations of G from G_w in either direction are shown to be self-sustaining and self-reinforcing. Horrod's steady state of growth is highly unstable: it is just like balancing on a razor edge. Hence, keeping the economy on the steady path of growth has been characterised as the razor-edge problem.

But, is there no check on the income of an economy shooting up or down without limit within Harrod's model ? Harrod's answer to the question seems to be a 'No unless a buffer intercedes. This is as far as the principle goes. But he does believe that there is an upper buffer as well as a lower buffer. While discussing the upper buffer, he introduces his third growth rate, namely, the natural growth rate which is defined as the maximum possible rate of growth which the economy can achieve and it is determined by such fundamental "natural" conditions as the rate of growth of population and labour force, the economy's natural resources and capital stock as well as the rate of technological progress. In Harrod's own words the natural growth rate, G_n, "is the maximum rate of growth allowed by the increase of population, accumulation of capital, technological improvement and the work/leisure preference schedule, assuming that there is always full employment in some sense." Harrod believes that there is no inherent tendency for the natural growth rate (G_n) and the warranted growth rate (G_w) to be identical.

Now, if the actual growth rate G is greater than the warranted growth rate G_w, the economy slips from equilibrium into disequilibrium and is caught into an upward spiral till it hits the buffer in the form of the 'full-employment' ceiling beyond which the real income cannot expand in the short-period due to the limited labour and capital resources. Similarly, if $G < G_w$, the economy slips into a downward spiral, but in the downward direction too, it hits a buffer in the form of a "floor" which stops the fall in income in the short period. This 'flloo' is fixed by the autonomous investment, the "break-even point" of the consumption, and the impossibility of gross investment becoming negative.

Harrod's natural rate of growth (G_n) performs a more fundamental function in his model. He makes use of it to further underline the inherent instability of the dynamic equilibrium and the stupendously difficult task of attaining steady growth. As already observed there is no inherent tendency for the G_n and G_w to be identical. If G_w happens to be greater than G_n, the actual growth rate G is bound to remain less than G_w and consequently, the economy is bound to remain in a chronic deflationary state. Furthermore, even if $G = G_w$, it will not ensure full employment of the working force, if $G_n > G_w$, though there may be full employment of the growing capital stock and the economy is strictly on the time-path of steady growth. Hence, if steady growth with full employment of the growing labour force is to be attained, the condition the razor edge problem still more sharp, for this condition is that all the three rates of growth must be equal : $G = G_w = G_n$.

Self Check Exercise-2

Q1. Discuss Harrod's steady state Growth?

16.5 Domar's Model

Evsey Domar took up directly the problem of capacity creating effect of investment, to which we referred in the very beginning of this lesson, and explored the implications of it for maintaining full employment of not only the capacity existing at any given time but also of the growing capacity of the economy over time. He posed this problem in his famour paper, "Expansion and Employment published in 1947. He underlined the dual nature of the investment process and posed the problem caused thereof as follows :

"Since investment increases productive capacity as well as income, what should be the rate of increase in investment in order to make the increase in income equal to that of productive capacity, so that full employment is maintained."

Thus, Domar's model is also an exploration into the conditions necessary for a steady or full employment equilibrium growth over time.

Domar makes the following assumptions in order to analyse the above problem. Firstly, it is assumed that the economy is initially in a state of full-employment equilibrium. Secondly, for the sake of simplification, it is assumed that there is neither the government sector, so that taxes and public expenditure are ruled out, nor the foreign sector so that imports and exports are also ruled out. Thirdly, again for the sake of simplification, it is assumed that the adjustments take place instantaneously without time lags. Fourthly, the average and marginal propensities are assumed to be equal and constant throughout the analysis, which too is only a simplification. Fifthly, the capital-output ratio is also assumed to be constant as in Harrod's model. Moreover, it should be kept in mind that income, investment and savings referred to in the model refer to net income, net investment and net savings.

Now let investment be I and the increase in productive capacity caused by one unit of investment (a rupee for example) on the average be denoted by s, i.e. s = $\frac{\Delta Y}{1}$ then the total increase in the productive capacity of the economy will be I.s

However, Domar feels that the new capital stock brought into existence by investment will operate, to some extent, at the expense of the old capital stock due to competition for scarce complementary factors of production as well as for markets; therefore the output of the old plants is likely to be reduced to some extent. In that case, the productive capacity of the economy as a whole, according to Domar, will not increase by (I.s) but will increase by a smaller amount (I.σ) where σ is less than s.

It follows from the preceding argument that the increase in productive capacity brought about by investment will be (I. σ) which represents the potential increase in the aggregate supply of the economy, if there is full employment of the capital stock. Now, if full-employment equilibrium at the higher level (because the productive capacity and the income potential of the economy are higher consequent upon the investment) is to be maintained and thus the economy is to be kept along the time path of steady growth, the aggregate demand of the economy must also increase to the same extent as the aggregate supply potential. We know it from the theory of the multiplier that income of an economy increases multiplier times the increase in investment, where multiplier equals the reciprocal of the marginal propensity to save which Domar denotes with the Greek letter σ. Therefore, the total increase in income or the aggregate demand will be represented by $\left(\Delta I.\frac{1}{\alpha}\right)$

Since the condition of full employment equilibrium is that the total expenditure in the economy must be sufficient to clear away the full-employment level of supplies of goods, and since we have assumed that the economy was initially in full-employment equilibrium, this equilibrium will be maintained even after the new investment has taken place, if and only if the total increase in aggregate supply of goods (I. σ) equals the total increase in income $\left(\Delta I.\frac{1}{\alpha}\right)$ consequent upon new investment. Therefore the condition of this dynamic equilibrium or of steady growth may be written as follows:

(1) $\Delta I. \frac{1}{\alpha} = I. \sigma$

which can be rewritten after rearrangement as follows :

(2) $\frac{\Delta 1}{1} = \alpha.$

Domar has further assumed that the rate of growth of income is equal to the rate of growth of investment so that $\frac{\Delta Y}{Y} = \frac{\Delta 1}{1}$. In view of this assumption, the equation (2) above can also be written as follows :

(3) $\frac{\Delta Y}{Y} = \frac{\Delta 1}{1} = \alpha\ \sigma.$

which is Domar's steady state growth equation.

The equation (3) implies that if the full employment equilibrium is to be maintained over time, the investment and income must go on increasing at a cosntant annual percentage rate equalling the product of the propensity to save (α) and the average productivity of investments (σ) This is Domar's solution to the problem posed by him.

It may be pointed out here that the result of Domar's model is very much similar to the result of Harrods's model. $\frac{\Delta Y}{Y}$ in Domar's model is the same as Harrods warronted, warranted growth rate G_w Domar's α is the same as Harrod's s, for both, α and s, denote the marginal propensity in save. Domar's σ is the average productivity of investment, i.e. $\frac{\Delta Y}{1}$ which is but the reciprocal of the required capital-output ratio or the accelerator, C_r, employed in Harrod's model. Hence, if we use Harrod's symbols and remember that Domar's a equals Harrod's $\frac{1}{C_r}$ Domar's steady state growth equation can also be written as follows :

$$\frac{\Delta Y}{Y}, = \frac{\Delta 1}{1}\ \alpha\ \sigma = \frac{s}{C_r}$$

It is due to this particular similarity between the models of Domar and Harrod that these two models are usually lumped together under the heading. "Harrod-Domar Model".

It will be useful here to compare Domar's analysis with Keynes's analysis in order to bring out the essential difference between thelong-run equilibrium analysis of Domar and the short-run equilibrium analysis of Keynes. Keynes, who was concerned with the analysis of the conditions necessary to achieve full employment of the given existing productive capacity of an economy. "was led to the conclusion that the full-employment equilibrium of the economy would be attained today, if full-employment level of savings are invested. But Domar, who is concerned with the analysis of the condition of full-employment of a growing productive capacity, was led to the conclusion that if just sufficient investment is undertaken to maintain full-employment "today", un-employment may still crop up "tomorrow" when the productive capacity of the economy would be eater than it is "today" due to the effect of investment done today". Hence the dilemma: if sufficient investment is done today", still more of it will be needed "tomorrow" in order to increase demand sufficiently such that the increased capacity is fully utilised "tomorrow" investment and income must grow exponentially, if the growing capital stock of the economy is to be fully employed all the time, or, as Alice would have said, we have to run faster and faster in order to stand still.

Like Harrod, Domar too demonstrates that there is no inherent tendency for a capitalist economy to attain the growth rate required for a steady state growth, even though there does exist such a rate. Thus, in Domar's model too, the problem of attaining steady state growth is razor-edge problem. As Domar himself observed, "so far as unemployment is concerned, investment is at the same time a cure for the disease and the cause of even greater ills in future". It is the capacity increasing effect of investment which creates all the trouble and demands that investment should advance faster and faster on which condition the full-employment equilibrium of a growing economy precariously depends.

Criticism of Harrod-Domar Model

The Harrod-Domar Model, inspite of its pioneering role has been found to suffer from some serious flaws. Perhaps the most vulnerable part of this model which has been widely criticised is the assumptions of a constant propensity to save and the absolutely fixed capital-output ratio. It is alleged that it is these assumptions which have made the problem of attaining and maintaining steady state growth a razor- edge problem. These critics point out that in reality the saving ratio as well as the capital-output ratio is likely to change over the long run.

Those changes will modify the requirements of steady growth which are made to look so formidable in the models of Harmd and Domar. For example, if the durability of additional capital stock that comes into existence as the result of investment is short, the productive capacity will not increase as much as it would otherwise and, hence, the requirements of steady growth will be less stringent. Similarly, if the propensity to consume rises and thus the propensity to save falls during the process of growth, the growth rate required for a steady equilibrium growth will be less stringent. The logic of this criticism is alright, but whether the saving ratio and the capital-output ratio rise or fall as growth proceeds on is something which, cannot be decided a priori: this should be rather found out empirically.

Moreover, if we drop the assumption of fixed proportions which is implicit in Harrod-Domar model, and allow for the possibility of substitution between labour and capital as in the neoclassical theory, the conditions of steady state growth will turn out to be less stringent and it may not at all be as precarious as balancing on the edge of a razor.

The models of Harrod and Domar also fail to consider the role of prices in relation to steady growth. Infact, they abstract from the price changes, assuming implicity that prices remain constant. Some critics hold that a slight price flexibility may help in stabilising the otherwise unstable system. For example, when prices rise in consequence of the actual growth rate being greater than the warranted growth rate, the rising prices may help in checking the actual growth rate from departing too far away from the warranted growth rate, because given increase in expenditure then brings out less than proportionate increase in production and will therefore, require a correspondingly smaller amount of new investment.

It is, therefore, suggested that if allowance is made for price changes as well as for variations in factor proportions and, therefore for variations in capital-output ratio too, then the system may be very much less unstable than it is shown to be in the models of Harrod and Domar.

Another weakness of these models is that they are models of what may be described as spontaneous growth in the determination of which the government as the planning authority plays no role. Consequently, they may not be applicable to the underdeveloped or developing countries where growth is sought to be accelerated through planned government action.

Further, it is also pointed out that even as models of spontaneous growth, they are not very useful insofar as they are one factor models because the growth of real income in these models has been related to changes in the capital stock alone.

Self Check Exercise-3

Q1. Discuss Domar's Model.

16.6 Summary

Economic growth is the process where by the real percapita Income of a country increase over a long Period of time. We enumerate the factors which lead to the growth of an economy.

Growth of Population, Particularly working Population, is the first. Cause of growth. A rapidly growing population to the growth of the national product keeps the out-put-per head at a low level. This has been the case with the developing countries like India. On the other land, the increase in the out-put per head of developed economies like the United States has been much wiser because of their low rates of population growth in relation to the growth rates of their national product.

The process of economic growth is concerned with the means by which an economy achieves successively higher levels of productive capacity. The process is stimuted by various factors and variables. Some economists have given Models which attempt to explain the process of economic growth or long non income determination.

16.7 Glossary

The Harrod-Domar Models of economic growth are based on the experience of advanced economies. They are primarily addressed to an advanced capitalist economy and attempt to analyse the requirements of steady growth in such economy..

Both Harrod and Domar are interested in discovering the rate of income growth necessary for a smooth and uninterrupted working of the economy. Though their models differ in details, yet they arrive at similar conclusions.

16.8 Answers to Self Check Exercises

Self Check exercise -1

Ans.1. Refer to Section 16.3

Self Check exercise -2

Ans.1. Refer to Section 16.4

Self Check exercise -3

Ans.1. Refer to Section 16.5

16.9 References/ SUGGESTED READINGS

1. E. Shapiro, Macroeconomic Analysis, 3rd. ed. Ch. 21-22.
2. Derberg and McDougall, Macroeconomcis 4th. ed. pp. 309-330
3. A.K. Sen (ed), Growth Economics, Penguin pp. 9-77
4. J.A. Kregel, The Theory of Economic Growth, Ch. 2
5. W.H. Bronson, Macroeconomic Theory & Policy Part V. Ch. 21

16.10 TELMINAL QUESTIONS

1. What is steady state growth? What are its conditions?
2. Explain the salient features of the Harrod-Domar model and bring out its short comings.

*****

Unit-17

GROTH MODELS (2)

STRUCTURE

17.1 INTRODUCTION

In the preceding lesson, we considered two growth models of Harrod and Domar which found to be very much similar and were based on the Keynesian approach. These models, as it was emphasised in the preceding lesson, were based upon the assumptions that the saving ratio (s) or the propensity to save and the capital-output as well as the capital-labour ratio are exogenously given and are constant. It followed, in these models that the equilibrium rate of growth was unique for it depended on the saving ratio (s.) and the required capital-output ratio (C_r) both of which were assumed to be fixed. These models also implied that an economy with a higher propensity to save has a higher growth rate than an economy that has a lower propensity to save. The uniqueness of the equilibrium growth rate (G_w) and therefore of the steady state growth rate too ($G = G_w = G_n$) led to the conclusion that, in general, the steady state growth could not be attained in a free-market economy. It would be a rare good luck, if the economy had a growth rate (G) which equaled the warranted as well as the natural growth rate, and even if it was attained, the economy would be hard put to maintain this equality. Hence the razor-edge problem.

The neoclassical model that we shall expound in this lesson takes a more optimistic view of the matter. However, it may be said at the very outset that the neoclassical economic theory proper, as it developed in the hands of its founders like Walras, Menger, Jevons, Marshall, J.B, Clark, Wicksell, etc., had practically no theory of economic growth, preoccupied as it was with the static problem of allocation of resources. However, some modem economists in the neoclassical tradition have formulated a theory of economic growth on the basis of the neo-classical assumptions and conclusions. This formulation, has come to be known as the neoclassical growth theory. The important names associated with the development of the neoclassical theory of growth are R.M. Solow ("A Contribution to the Theory of Economic Growth", QJF, Feb, 1956.

17.2 Learning Objectives :-

After going through this chapter you will be able

- To understand Neo-Classical Model of Economic Growth
- To differentiate between Neo-Classical Model and Harrod Domar of Economic Growth.

17.3 Basic Difference between Neo classical and Harrod- Domar Model.

"Technical Change and the Aggregate Production Function". RE & S. Aug. 1957). T.W. Swan ("Economic Growth and Capital Accumulation". ER. Nov. 1956 and J. E. Meade (A Neoclassical Theory of Economic Growth, 1961). We shall present here what may be described as the standard neoclassical model.

The basic difference between the neoclassical model and the Harrod-Domar model is to be found in the different assumptions underlying them, on the one hand, and the bac analytical approach applied, on the other, Unlike the Harrod-Domar model, the neoclassical model assumes that the capital-labour as well as the capital-output ratio is variable. Consequently, the equilibrium as well as the steady state growth rate in the neoclassical model is not unique but is variable. This can be shown with the help of Harrod's growth equation:

$G_w = \frac{s}{C_r}$ Since, in Harrod-Domar model, both, s and C_r. are assumed to be constant, there is a unique warranted or equilibrium growth rate. But, in the neoclassical model, C_r is variable therefore with a given s, more than one equilibrium growth rate (G_w) is possible. Another implication of this difference in assumptions is that while the Harrod-Domar model suggests that G_w will be higher in an economy where s is higher, the neoclassical model suggests that it need not be so, for the economy with the higher s will have a higher C_r also with the result that the G_w in any two economies will be the same regardless of the difference in their propensities to save.

As regards the particular analytical approach adopted, the Harrod-Domar model has Keynesian orientation while the neoclassical model has its roots in the neoclassical propositions. The difference shows itself in the Harrod-Domar model being dominated by the aggregate demand considerations and the neoclassical) model being dominated by the supply side considerations. The neoclassical model is based on the neoclassical proposition that in a freely competitive market economy, any growth in the supplies of labour and capital will automatically be absorbed into employment through the appropriate change in their market prices. Hence, full employment, whether of the growging capital stock or of the growing labour supplies, which is the focal point of analysis in the Harrod Domar model is no problem at all in the neoclassical model. Full-employment equilibrium is always ensured in the neoclassical model, provided the market forces are allowed to work freely. On account of this difference in approach, while Harrod and Domar are concerned with analysing the conditions of a steady state growth, the neoclassical model is concerned with demonstrating that a free-market economy grows at the rate at which the labour and capital resources of the economy are growing over time: growth depends on the supply side considerations and not on the demand side considerations; as in the Say's Law of markets, demand side creates no problem at all.

We have so far given a sort of a preview of the conclusions or implications of the neoclassical model. Now, we shall try to explain the analytical argument running through this model.

Self Check Exercise-1

Q1. Discuss the basic difference between Neo Classical and Harrod-Domar model.

17.4 Assumptions of Neo-Classical Model.

The specifically neoclassical assumptions of the model are; (i) The capital-output ratio as well as the capital-labour ratio is variable. (ii) Full-employment equilibrium is automatically ensured. How it is ensured as a rule is not specified, though most of the neoclassical growth theorists seem to argue that this will be ensured through a proper adjustment in the rate of interest which will bring the investment undertaken by entrepreneurs in equality with full-employment level of saving, or it may be brought about through the working of the real-balances effect, provided all prices inclusive of wage rate and interest rate are perfectly flexible in either direction, which again, is a typically neoclassical assumption. (iii) Real income or output is a function of the quantity of the productive resources which, for the sake of simplification, are reduced to only two, namely, capital and labour which are, further, assumed to be homogenous. In addition, it is also a function of technology which, at the first level of analysis, is assumed to remain constant. (iv) The production function relating output to factor inputs is assumed to be homogenous of the first degree, that is, constant returns to scale and diminishing returns to factor proportions are assumed.

In view of the specific assumption made with regard to the production function, this function may be written as follows :

(1) $Y = f(K, L, A)$

Where Y is real income or output, K is capital, L is labour and A is technology.

Since technology is assumed to be constant, to start with, therefore the above production function can be rewritten as follows :

(2) $Y = A f(K, L)$

When the quantity of capital is increased by an infinitesimally small amount, while the quantity of labour combined with it is kept constant, the addition made to the total output or real income is the marginal physical productivity of capital (MPP_t). If, at any given point, the capital is increased by a finite amount, keeping the amount of labour constant, the addition made to the total output or real income will equal the product of the marginal physical product of capital and the amount by which capital is increased. This relationship can be expressed as follows:

(3) $\Delta Y = MPP_k . \Delta K$

Similarly, if the amount of capitalis kept constant but the amount of labour is increased finitely, the consequent increase in income can be expressed by the following relation:

(4) $\Delta Y = MMP_L \Delta L$

Where MPP_1 is the marginal physical product of labour and ΔL is the finite amount by which labour is increased.

If both the factors (capital and labour) are increased together in the same proportion, and there are constant returns to scale as it is assumed to be in the neoclassical model, for the neoclassical production function represented by equation (2) above is assumed to be homogenous of the first degree, the total increase in real income will be represented by the following relation:

(5) $\Delta Y = (MPP_k . \Delta K) + (MPP_1 \Delta L)$

Dividing both sides of equation (5) by Y

(6) $$\frac{\Delta Y}{Y} = \left(\frac{MPP_k}{Y} \Delta K \right) + \left(\frac{MPP_L}{Y} \Delta L \right)$$

or

(7) $$\left(\frac{\Delta Y}{Y} \right) = a \frac{\Delta K}{K} + (1-a) \frac{\Delta L}{L} \left(\frac{MPP_k . K}{Y} \frac{\Delta K}{K} \right) + \left(\frac{MPP_L . L}{Y} \frac{\Delta L}{L} \right)$$

Since the production function, Y=A. f (K, L) is assumed to be homogenous of the first degree, therefore it follows from the Euler's Theorem that,

(8) $MPP_k K + MPP_L L = Y$

It is because MPP_k is the partial derivative of the function Y = A f (K,L) with respect to K and MMP is the partial derivative of the same function with respect to L.. It should be noted that K and L in the above equation (8) represent the total amounts of capital and labour respectively that are employed in production.

If we divide both sides of equation (8) by Y, we get

(9) $$\frac{MPP_k . K}{Y} + \frac{MPP_L . L}{V} = 1$$

The neoclassical theory of distribution is the well- known marginal productivity theory of distribution, according to which each factor gets its share in the total product at the rate equaling its marginal product. On this principle, the total share of a factor will equal the product of the total quantity of the factor and its marginal product. Hence, in equation (9) above. MPP_k

K represents the share of capital in the total income of the economy and, likewise, MPP_L L. represents the share of labour in the total income, $\frac{MPP_k.K}{Y}$ then, is the fraction of total income going to capital and MPP_L L/Y is the fraction of total income going to labour. They also represent respectively the share of profits and the share of wages as a proportion of total income. These proportional shares must add up to unity as shown in equation (9).

Let us indicate the relative share of capital in the national income (Y) by the letter a. Then the relative share of labour will be indicated by (1-a). This follows from (9). That is, to say, we put MPP K a so that $\frac{MPP_L.L}{Y}$ = 1-a. Putting these values into equation (7).

(10) $$\frac{\Delta Y}{Y} = a\frac{\Delta K}{K} + (1-a)\frac{\Delta L}{L}$$

As already pointed out a represents the share of capital as a proportion of total income. It also measure the elasticity of output with respect to changes in the amount of capital (K) used, Similarly (1-a) measures the elasticity of output with respect to changes in the mount of labour used. However, the importance of equation (10) above from the point of view of our immediate objective is that it gives us the neoclassical determinants of the rate of growth $\left(\frac{\Delta Y}{Y}\right)$ Since a is a constant, (1-a) is also constant and, hence, $\frac{\Delta Y}{Y}$ or the rate of growth of income depends on $\frac{\Delta K}{K}$ and $\frac{1}{3}$. that is it, depends on the rates of growth of the capital stock (K) and labour supply (L).

In a way, the equation (10) shows the fundamental difference between the neoclassical model and the Harrod-Domar model of growth. In the latter model, since capital-labour ratio is assumed to be fixed by technology, the total income of the system can increase at a rate at which the slower of the two factors is increasing. For crample, if capital stock is increasing at the rate of 2 per cent per annum, while the supply of labour is increasing at the rate 3 per cent per annum, the maximum rate at which the national income can grow will be only 2 per cent causing unemployment of labour. Similarly, if the capital stock is increasing at the rate of 4 per cent per annum while the labour supply is increasing at the rate of, say, only 2 per cent per annum, the maximum attainable rate of growth in national income will be only 2 per cent which will cause unemployment of capital stock in the form of idle excess capacity. But, in the neoclassical model, there is no such problem, because the factor proportions are assumed to be variable and, therefore, capital-labour ratio can be appropriately changed to absorb fully the growth in both the factors regardless of their different growth rates. In the case of the first example given above, the maximum attainable growth rate within the neoclassical model will be : 2a + 3(1—a). Supposing a = $\frac{1}{3}$ and, therefore, (1—a) = $\frac{2}{3}$, this rate works out to be : $2\frac{1}{3}+3\frac{2}{3}=\frac{1}{3}$= 2.6 and both the factors will be fully employed. In the case of the second example, this rate of income growth will work out to be : 4. $\frac{1}{3}+2\frac{.2}{3}=\frac{1}{4}$ which again works out coincidently to be 2.6 per cent.

Since by definition increase in capital stock (ΔK) equals investment (I), therefore ΔK = 1 investment, in squilibrium, equals savings which equal αY, where α is the propensity to save. Therefore, ΔK = I = α Y. And, σ of Domar being the average producticity of capital $\sigma=\frac{Y}{K}$ or $K=\frac{Y}{\sigma}$. Therefore $\frac{\Delta K}{K}=\frac{\sigma Y}{Y/\sigma}$ = ασ Inserting this value of $\frac{\Delta K}{K}$ in equation (10),

(11) $\frac{\Delta Y}{Y}$ = α (ασ) + (1—a) $\frac{\Delta L}{L}$

This equation (11) clearly show the difference between the Harrod-Domar model and the neoclassical model. In the Domar's version of Harrod-Domar model, the rate of growth $\left(\frac{\Delta Y}{Y}\right)$ equals (a o), But in the neoclassical model, as shown in equation (11), the growth of capital stock by itself is inadequate to explain the rate of growth of income. The second term on the right hand side of equation (11) shows that the growth of labour supply also determines the rate, of growth of income. As a matter of fact, if we remember that the empirical investigations have generally found that the relative share of capital in income ranges between $\frac{1}{4}$ to $\frac{1}{3}$ the equation (11) further shows that the growth of capital stock is relatively less important in explaining growth, for, while the elasticity of output with respect to capital (a) lies between $\frac{1}{4}$ or $\frac{1}{3}$ the elasticity of output with respect to labour (1-a) lies between 3 to which range is much higher than the former. If the rate of saving (a) doubles in Harrod-Domar model, the rate of income growth will also be doubled. But not so in the neoclassical model unless the elasticity of output with respect to capital is unity and, therefore, the elasticity of output with respect to labour is zero which can happen only when labour is a free good rather than an economic good. Thus, in this sense the Harrod Domar model is a single-factor model while the neoclassical model is a two-factor model. Moreover, while the rate of growth in income in the Harrod-Domar model depends only on the rate of capital accumulation, in the neoclassical model, it depends not only on the rate of capital accumulation (ΔK/K) but also on the rate of growth of labour supply (ΔL/L) as well as on the output elasticities of capital and labour.

Now we have come nearer to the understanding of the condition of steady state growth and propounded in the standard neoclassical model. What we have to do now is to discover the implication of the above equation (10) which summarises the neoclassical theory of economic growth. In order to find out the rate of growth in output per worker, we have to subtract, from the over-all rate of growth in output, that part of this rate which is due to the rate of increase in the labour force. This we do by subtracting the rate of growth of labour force $\left(\frac{\Delta L}{L}\right)$ from the overall rate of growth of output $\left(\frac{\Delta Y}{Y}\right)\left(\frac{\Delta K}{K}\right)\left(\frac{\Delta K}{K}-\frac{\Delta L}{L}\right)$. Thus, if we subtract

$\left(\frac{\Delta L}{L}\right)$ from the both sides of equation (10), the equality will still be maintained and will take the following form.

$$(12) \quad \left(\frac{\Delta Y}{Y}\right) - \left(\frac{\Delta L}{L}\right) = \alpha. \left(\frac{\Delta K}{K}\right) + (1\text{-a}) \ \frac{\Delta L}{L} - \frac{\Delta L}{L}$$

Simplifying (12), we have

$$(13) \quad \left(\frac{\Delta Y}{Y}\right) - \left(\frac{\Delta L}{L}\right) = \alpha. \left(\frac{\Delta K}{K} - \frac{\Delta L}{L}\right)$$

The left hand side of (13), as already explained above, represents the rate of growth of per capita output. On the same argument the expression within the brackets on the right hand side represents the rate of growth of capital per worker. The equation (13) shows that the per capita output grows at a rate equalling the rate of growth of capital per worker, when this rate is weighted by the output elasticity of capital.

But capital per worker can increase only if the supply of capital increases more than the supply of labour. On the other hand, the homogenous production function of the first degree assumed in the neoclassical model implies constant returns to scale but diminishing returns to factor proportions. Therefore, as the capital grows at a rate greater than the rate at which labour force is increasing and the capital-labour ratio in the economy rises, the marginal product of capital will diminish and, therefore, the rate of profit will also diminish. This will be a signal to the entrepreneurs, who are assumed to be guided by the relative factor prices in the choice of the right factor proportioms, to vary the capital-labour ratio in favour of labour and against capital. The neoclassical growth economists also believe that the rate of profit, in equilibrium, equals the rate of interest. In fact, the rate of profit in the standard neoclassical growth model is identified with the rate of interest in the classical tradition. As the rate of interest falls, it will slow down the rate of saving and capital accumulation with the result that capital and labour will, once again, grow in step with each other ensuring a steady state growth.

The foregoing analysis leads us to two important conclusions. First, it pinpoints the condition of steady growth in the absence of technological progress, for throughout, so far, we have assumed the technology to be constant. The condition of steady state growth highlighted by this model is that, provided the technology remains constant, steady state growth requires that capital, labour supply and output should grow at the same rate, that is,

$$\frac{\Delta K}{K} = \frac{\Delta L}{L} = \frac{\Delta Y}{Y}$$

Secondly the neoclassical model suggests that this condition tends to be automatically satisfied through the free working of the price mechanism. The changes in the profit rate relatively to the wage rate tends to pull the economy back on to the track of steady growth, if it happens to deviate from that path of steady growth.

It should also be obvious from our discussion so far that the neoclassical steady state growth rate is also the natural growth rate is as much as the former equals $\frac{\Delta L}{L}$ which may be taken to symbolise the natural growth rate. Indeed, the neoclassical model assumes unbounded optimism. The razor-edge problem, which makes the models of Harrod and Domar highly pessimistic, does not exist for the neoclassicals. They have done the trick simply by assuming the capital- labour and the capital-output ratio to be variable and the prices to be perfectly flexible. Moreover, the neoclassical condition of steady growth also shows that provided the growth rate of savings (which equals the rate of growth of capital stock $\frac{\Delta K}{K}$, remains equal to the growth rate of labour supply, the level of savings as such has no significance for the rate of growth of output. In any two economies in a state of steady growth and having the same rate of growth of labour supply but one of them having a higher level of savings than the other, the rate of growth of output will be the same, though the economy with the higher level of savings will have a higher capital-output and a higher capital-labour ratio and, therefore, a higher absolute level of income per worker too. This is not so in the Harrod-Domar model for, there, a higher level of savings implies a higher rate of growth in output.

Self Check Exercise-2

Q1. Discuss various assumptions of Neo Classical Model.

17.5 Critical Assessment

The unbounded optimism and a no less unbounded belief of the neoclassicals in the freely working price system having the properties which steers the economy along the path of steady growth are based on assumptions which are too smooth to correspond with the facts of the world that we live in. In the first place, the assumption of freely variable capital-labour and capital-output ratio is questionable, for, due to the technological considerations, these ratios may not be variable at all and even if they are variable, the range within which they are variable is very much limited. In view of this, the faith put in the capacity of a freely competitive economy to bring about automatic steady growth is indeed misplaced.

Secondly, as Mrs. Joan Robinson and her followers have been all along stressing, the neoclassical assumption of freely variable capital-labour ratio is based on another implicit assumption, namely, that capital is not only homogenous but also malleable. In the real world, capital is found in heterogenous forms, one form of which cannot be converted into another form. Only when we assume it to be malleable, can it be said that one form of capital can be converted into any other form. But such an assumption hardly coresponds with the facts of the real world.

Thirdly, if we drop the assumption of homogenous and malleable capital, it leads to further difficulties which are related to the problem of measurement of capital which, in turn, leads to the questioning of the marginal productivity theory of distribution which is a key argument in the neoclassical model of economic growth. It is on account of this that it is sometimes pointed out that the weakest spot in the neoclassical model of economic growth is its theory of distribution. You might have seen during the course of our expounding the main elements of the neoclassical model that it is the changes in the rate of profit which brings about the right capital-labour and capital-output ratios consistent with steady growth. But the problem is how to measure this rate of profit when capital is not homogenous. You cannot reduce it to a common measure in terms of value, because, in order to know the value of each type of capital, you must first know the rate of profit itself. Thus, without knowing the value of capital, we cannot determine the rate of profit and without knowing the rate of profit, we cannot know the value of capital.

Fourthly, the Keynesians also question the neoclassical assumption of an automatic full-employment equilibrium. In a sense this may be a still more vulnerable spot in the neoclassical mode. It has been observed that Harrod did not reject the neoclassical model on the grounds of its assumption of a freely variable capital-output ratio because he believed that this Oratio was unalterable due to technological considerations. He rejected it on the orthodox Keynesian line that questions the inherent tendency of a freely competitive economy to bring about full-employment equilibrium. In its basic form the neoclassical model assumes growth to be always consistent with full employment equilibrium. This implies that the neoclassical believe that the desired investment tends automatically to be brought into equality with the full employment level of savings. But their model does not spell out the mechanism through which this is brought about. However, they seem to have in mind some financial mechanism which causes appropriate changes in the rate of interest such that this equality between investment and full employment of savings is established. It is obvious that full-employment equilibrium will not be established, if the rate of interest fails to adjust to this particular rate or if the investment function is such that there is no positive rate of interest at which sufficient investment would be undertaken to absorb all the savings out of the full-employment level of income. As it is, most presentations of the neoclassical model do not specify the nature of the investment function. Nor do they, as a rule, include the rate of interest as distinguished from the rate of profit, as an explicit endogenous varibale of the model. It has been suggested by the Keynesians that if the investment function is interest-inelastic, the economy visualised in the neoclassical model, with all its questionable assumptions, may attain steady rate of growth but the neoclassical claim that this will also be always the full- employment equilibrium rate will not be tenable.

Self Check Exercise-3

Q1. Discuss various shortcomings of Neo Classical Model.

17.6 Summary

The neo-classical model of economic growth is associated with the names of J.E. Meade, R.M. Solow, Samuelson and H.G. Honson. The neo-classical Model is based on certain assumptions, viz, a classical laissez-faire economy with full employment, perfectly competitive market-conditions, constant returns to scale, substitution of labour and capital, wage and price flexibility and factor payments in accordance with their Marginal Physical Productivity.

The rate of growth of the output of the economy depends essentially upon the rate at which its stock of capital labour force and technical knowledge grow over time.

17.7 Glossary

Professor J.E. Meade of the University of Cambridge has constructed a neo-classical model of economic growth which is designed to show the way in which the simplest form of classical economic system would behave during a process of equilibrium growth.

Professor R.M. Solow buids his model of economic growth as an alternative to the Harrod-Domar line of thought without the dubious assumptions of the latter.

Professor Kaldor summed up six factors that have led to the growth of advanced industrial economies. These are termed as the stylized facts" which a growth model must explain. They are in short as under:

(1) The growth rates of output and labour input are constant over time.

(2) Capital-labour ratio increases through time.

(3) The growth rate of capital stock and the growth rate of real output is about the same.

(4) The profit rate, defined as the ratio of profit (P) to the capital stock (k) is fairly constant over the long run.

(5) The growth rate of output per man can change considerably from one country to another.

17.8 Answers to self check exercise

Self Check exercise -1

Ans.1. Refer to Section 17.3

Self Check exercise -2

Ans.1. Refer to Section 17.4

Self Check exercise -3

Ans.1. Refer to Section 17.5

17.9 References/ SUGGESTED READINGS

1. E. Shapiro Macroeconomic Analysis, 3rd, ed. Ch. 22
2. Dernberg and MacDougall , Macroeconomics, 4th. ed. pp. 309-330
3. A. K. Sen (ed), Growth Economics, Penguin pp. 20-30, 161-200.
4. J.A. Kregel, The Theory of Economic Growth Ch.4 :
5. Hahn and Mathews, "The Theory of Economic Growth; Reprinted in Survey of Economic Theory Vol. II

6. W.H. Branson, Macroeconomic Theory and Policy, Part V, Ch. 22,23.

17.10 Terminal Questions

1. What is steady state growth? What are its requirements according to Harrod ?
2. Bring out the salient features of the Neo-classical model of economic growth. How does it differ from the Harrod-Domar Model?

*****

Unit - 18

GROTH MODELS (3)

Structure

18.1 Introduction

The neoclassical model of economic growth that we explained in the last lesson was based upon the simplifying assumption that technology remains constant. Since growth theory is a long-run economic theory therefore, the assumption of constant, unchanging technology cannot be valid in the context of the long run. Accordingly we shall now introduce into the neoclassical model of growth the element of technical progress and shall see what happens to it in consequence of it.

It can hardly be disputed that technical progress contributes significantly to the rate of growth of output of an economy. But how it does is rather a complicated problem which we shall try to explain in as simple a manner as it might be possible.

18.2 Learning Objectives

Chapter you will be able to:

- understand Neo-Classical Model with technical Progress.
- understand Embodied and Disembodied TEchnological Progress.
- know the Golden Rule of Accumulation
- know the Growth Turnpikes

18.3 Neoclassical Model with Technological Progress

The first step in the explanation is to spell out the meaning of the term, "technological progress". Perhaps the easiest way to do it is to define technological progress as the input factor which raises the rate of growth of output of an economy above what it would be in its absence. Thus it is factor which is rather different from and independent of the two other input factors, capital and labour, admitted into the neoclassical model but which cooperates with them in the process of production and thus helps in raising the rate of growth of the economy above what it could be in its absence. If we ; denote technological progress with A, the rate of technological progress will be denoted by $\frac{\Delta A}{A}$ You can recollect that in the last lesson on the neoclassical model, we had assumed A to be constant and consequently the equation of the production function [equation (2)] was written as : Y = A*f* (K,L). Now that we make A, i.e. technological progress, an explicit variable, the equation (2) of the last lesson will take the following form :Y= *f*(K.LA). The equation of output growth rate [equation (10) Lesson 17] will take the following form:

(14) $$\frac{\Delta A}{A} + a\left(\frac{t}{K}\right) + (1—a)\ \frac{\Delta L}{L}$$

And, in place of equation (13) of the last lesson we have :

(15) $$\frac{\Delta Y}{Y} - \frac{\Delta L}{L} = \frac{\Delta A}{A} + a\left(\frac{\Delta K}{K} - \frac{\Delta L}{L}\right)$$

The implication of equation (13) was that per capita growth could not take place unless the rate of growth of capital $\frac{\Delta K}{K}$ was greater than the rate of growth of labour $\left(\frac{\Delta L}{L}\right)$ or, in other words, unless there was an increase in capital per worker. But with the introduction of technological progress $\frac{\left(\frac{\Delta K}{K} - \frac{\Delta L}{L}\right)}{\left(\frac{\Delta Y}{Y} - \frac{\Delta L}{L}\right)}$ as an explicit variable, this conclusion of the neoclassical model would not be valid. It is because even when capital and labour are growing at the same rate so that $\frac{\Delta K}{K} = \frac{\Delta L}{L}$ the per capita output growth rate $\left(\frac{\Delta K}{K} - \frac{\Delta L}{L}\right)$ would equal $\frac{\Delta A}{A}$ that is, the rate at which "technology progreses.

The rate of growth of output per worker is thus determined by the capital stock employed per worker and the rate of technological progress, where technological progess is a residual catch-all category of input covering all sources of growth other than the growth of capital and labour. The growth rate of output per worker due to the growth of capital per worker is : a $\left(\frac{\Delta K}{K} - \frac{\Delta L}{L}\right)$ which is evident from equation (13) of the previous lesson, and $\frac{\Delta Y}{Y}$ - $\frac{\Delta L}{L}$ is the total growth rate in output per worker. Hence the proportion of the latter growth rate attributable to growth of capital per worker would equal the ratio : $\frac{\left(\frac{\Delta K}{K} - \frac{\Delta L}{L}\right)}{\left(\frac{\Delta Y}{Y} - \frac{\Delta L}{L}\right)}$ which we may denote with the letter e. Now, if $\frac{\Delta K}{K} = \frac{\Delta Y}{Y}$ then e = a. but we have already mentioned in the previous lesson that the empirical value of a ranges between 0.25 and 0.33. Hence, under the assumption that $\frac{\Delta K}{K} = \frac{\Delta Y}{Y}$, the value of e will lie between 0.25 and 0.33. But, if $\frac{\Delta K}{K}$ is smaller than $\frac{\Delta Y}{Y}$ which has been an empirical fact, the value of e will be still smaller. This implies the conclusion that less than one-third of the growth of output per worker in the industrialised countries is attibutable to growth in capital per worker and the rest of it, that is, more than two-thirds of it is to be attributable to all other factors covered by the catch- all category of input that we have defined as "technological progress". The same conclusion The same conclusion can also be stated in an alternative form as follows: Less than one-third of the growth rate of total outputs is contributed by the growth rate of labour and capital inputs, while more than two-thirds of it is contributed by the increased output per unit of labour and capital inputs. This "increased output per unit of labour and capital", in fact. refers to increased productivity of labour and capital due to what we have. described as "technological progress"- the catch-all category of input covering all factors other than the physical inputs of labour and capital or, we may say, all such factors which enhance productivity of labour and capital.

Self Check Exercise-1

Q1. Discuss Neo Classical Model with technological progress.

18.4 Embodied and Disembodied Technological Progress

In the above analysis technological process was introduced as an input different from and independent of labour and capital. This implied that the growth rate of the capital stock and/or the growth rate of the labour force had no effect on the rate of technological progress. This concept of technological progress implies that neither technological advance is caused by the growth of capital stock and labour nor the technological takes the form of improved capital and improved labour force. It just rains down the skies by the mercy of God like manna falling from the heavens. Such a concept is a concept of "disembodied" technological progress which may be alright as a simplifying abstraction but it does not belong to the real world. In the real world, the technological progress not only depends on the growth of capital stock and labour but, more important by, it takes the form of improved capital goods and improved, more efficient work force. In other words, technological progress in the real world of ours gets embodied into better quality of machines and men and women working on these machines. This is the concept of "embodied" technological progress.

If technological progress is of "disembodied" type. it is possible to assume that it will benefit all workers alike without any necessity of embodying itself into better types of machines and/or more educated and better trained work force. Organisational improvements are sometimes referred to have this quality and are therefore instanced as "disembodied" technological progress. Under this type of technological progress, it is possible to treat all labour as homogeneous as the productivity of all workers, regardless of their age, education and training will benefit proportionally from such technological improvements. Similarly, all units of capital can also be assumed to be homogeneous as they too will benefit from such technological improvements proportionately regardless of their age and design.

"Embodied" technological progress, on the other hand, is a kind of technological advance which must take the form of newly produced capital goods and/or newly trained and educated labour-force before it can contribute to the rate of growth. Capital and labour thus cannot be treated as homogeneous. The capital stock, in this case, becomes a mixed stock of different "vintages." Inasmuch as they embody more technologically progress. newer machines are more productive than the older ones. Similarly, labour too cannot be homogeneous in this case. Workers too have different "vintages" distinguished by age, education and training. Individual workers of the current vintage (younger generation) are more productive than those of earlier vintages (older generation).

Technological Progress, it is observed, may either be embodied in physical capital or human capital or it may not be embodied at all. Technological advances of the first kind, that is, those which are embodied in the capital stock or the labour force, are sometimes described as "design" while the other "the disembodied" kind are described as "organisational". There is no agreement among the specialists of the subject on what proportion of "technical progress" in history has been of the "design" type and what proportion of it has been of the organisational" type. However, if it is true, as some argue plausibly, that the larger part of its is of the "design" type, then the real importance of capital would appear to be much greater than what can be measured conventionally by the growth rate of the physical stock of capital, because capital stock is the vehicle through which technological progress is fed into the process of production and without which the growth rate of output would be much lower than what is actually is. In other words, the embodied technical progress makes the effective growth rate of physical and human capital greater than the growth rate of these capitals in its physical units. Embodied technological progress improves the efficiency of both the physical capital and the human capital which tantamount to increase in the physical units of these at their levels of efficiency before this technological progress gets embodied into more efficient machines and better educated and better trained work force leading to higher productivity.

The above proposition can be illustrated with the following example. Let us suppose that the capital stock of our economy consists of twenty-year vintages equally divided into particular one-year models. We further assume that all capital goods have an average life of twenty years and they depreciate at the average uniform rate of five percent per year. We also assume tha the gross investment consists of only the replacement investment and, therefore, there is no net investment. This means that the gross investment is taking place at the rate of five percent per annum. Thus every year 5 percent of the machines are being replaced by new machines embodying technological progress. Now, if we suppose that the technological progress is taking place at the rate of 3.5%, that is, it has the effect of increasing the productivity of the machine of t-year vintage by 3.5% compared to that of a machine of the previous year (t-1) vintage, a twenty-year old machine, when it is replaced by a new machine embodying the technological progress of the past twenty years, will result in not only replacing the rate of output of the old replaced machine but will rather replace its rate of output with a rate of output double that of the replaced machines. It is because any variable growing at the rate of 3.5% per annum will double its value over a twenty-year period. In essence or "effectively", in this case, one machine is being replaced by not one but two machines of the old type. Though in a physical count the number of machines remain the same, their "effective" number is greater on account of the technological progress embodied in the machines replacing the twenty-year old machines. It is assumed here, however, that the real costs of the machines remain the same.

In the above hypothetical case, the capital stock does not increase in terms of a physical count as there is not net investment and, total or gross investment equals only replacement investment But, in essence or "effectively", the capital stock will be growing at the rate of five percent per year as every new machine has double the productivity of the machine being replaced by it.

The above argument demonstrates that the contribution of capital stock to the output growth rate of an economy is much greater when technological progress is "embodied" than when it is "disembodied".

It should be noted that the effect of embodied technological progress in the case of labour also is the same, that is, it tends to increase the "effective" rate of growth of labour force and thus increases its contribution to the output growth rate of the economy.

Self Check Exercise-2

Q1. What do you know about embodied and disembodied technological progress.

18.5 Neoclassical Model : Some Conclusions

The above discussion has some important implications for the neoclassical model of growth. We had seen that in contrast to the Harrod-Domar model in which capital/labour ratio is assumed to be fixed, the basic classical model treats the capital stock as a homogeneous factor which can be reshaped and adjusted to be used with any quantity of labour. But the introduction of embodied technological progress in the model makes it invalid to consider capital as homogeneous. Each vintage of capital will differ from every other vintage in terms of the technological progress embodied in them.

The above conclusion logically leads to the other one, namely, that each capital good will not be combined with the same number of workers. Capital goods of older vintage will require larger amounts of labour per unit compared to the capital goods, of more recent vintage.

Moreover, in practice, the amount of labour required per unit of the existing stock of capital goods of each vintage is not variable over a wide range, so that the total of existing capital stock will similarly have a more or less fixed labour requirement. This implies that the neoclassical assumption that capital/labour ratio is freely variable is, strictly speaking, valid only in the case of capital goods at the "design" stage. Only at this stage it is possible to choose between alternative technologies requiring alternative capital/labour ratios. But once a particular technology is adopted, the capital/labour ratio becomes fixed.

Besides, it should be noted that there is not an infinite number of technologies available even at the "design" stage which means that only a limited number of technologies requiring different capital/labour ratios are available. This implies that even at the "design" stage the factor proportion is not perfectly variable as it is assumed in the neoclassical theory.

18.6 The Golden Rule of Accumulation

The neoclassical theory of economic growth as explained in the preceding and the present lesson above tells us that under the neoclassical assumptions, output, investment and consumption all grow at the same rate along the long-run equilibrium growth path.

The per capita output, investment and consumption also grow at the same rate along this long- run equilibrium growth path. This means that along this balanced growth path there is balance in the division of output between consumption and investment on the output side and between profits and wages on the income side and the division is stable over time along this balanced growth path.

Moreover, the neoclassical model also implies that the rate of growth of output, consumption and investment in the long-run equilibrium of an economy is determined by the rate of growth of labour force $\left(gL = \frac{\Delta L}{L} \right)$ plus the rate of growth of labour productivity (λ) which is exogenously determined. On the other hand, the level of the growth path given by the equilibrium levels of per effective worker capital stock (k*) and output per effective worker (q*) is determined jointly by the natural growth rate, $n = g_t + \lambda$, and by the saving behaviour of the economy.

An increase in the saving ratio, s, raises the equilibrium values of capital stock per effective worker (k*) and output per effective worker (q*) as the result of which the economy is lifted on to a higher equilibrium growth path. This means that corresponding to every saving ratio there is a particular equilibrium growth path such that a higher saving ratio is associated with a higher level of equilibrium growth path. Now, this raises the following question :

If the saving ratio, s, can be controlled by the society, which of the many alternative equilibrium growth paths which are possible should be chosen? In other words, what is the optimum value of the saving ratio for the society. Or, which is the optimum equilibrium growth path for the society, the choice of which will automatically determine the optimum saving ratio? The so-called Golden Rule of Accumulation associated with the name of E.S Phelps is related to this problem.

E.S. Phelp's Golden Rule of Accumulation states that the long-run equilibrium growth path that maximises per capita consumption in all periods, once the economy has reached its equilibrium path, is determined by that equilibrium level of capital per effective worker (k^*) at which $f(k) = g + \lambda = n$.

This implies that the optimum equilibrium path of the economy is determined by the condition that the slope of the production function, $q = f(k)$ or $q=f\left(\frac{K}{E}\right)$. equal the national of growth (n) which equals the sum of the rate of growth of labour (g_t) and the rate of technological progress (λ). This is illustrated in Fig. 18.1 and Fig. 18.2 below.

In Fig. 18.1, the horizontal axis represents $k = \frac{Q}{E}$, E being the effective labour force embodying the effect of technological progress. The vertical axis represents the output per unit of effective labour force, that is, $q = \frac{Q}{E}$ which, in the neoclassical model, is a function of capital per unit of effective labour force: $q = f(k)$. $f(k)$ in Fig. 18.1 represents this production function which is assumed to be homogenous of the first degree implying constant returns to scale. The ray $\frac{gL+\lambda}{s}k$ passing through the origin represents output per effective worker (q) which is required at any given level of k, say, k_n, to maintain that level of k, when the rate of investment per unit of time equals by definiton $\frac{\frac{dK}{dt}}{K}$ in order to maintain any given level of k with effective labour (E) growing at the rate (g_t, + λ).

Therefore

$$\frac{\frac{dK}{dt}}{K} = (gL + \lambda)$$

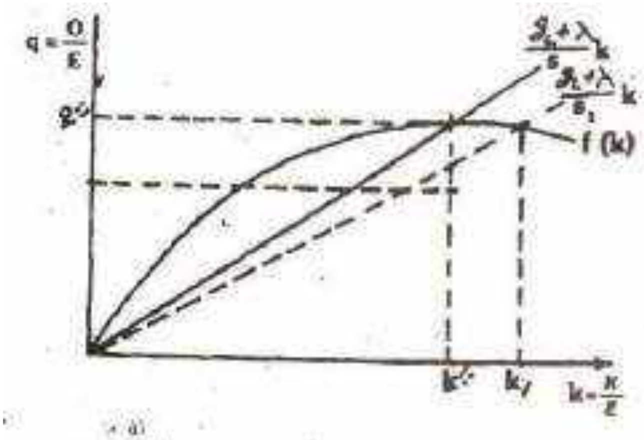


Fig. 18.1

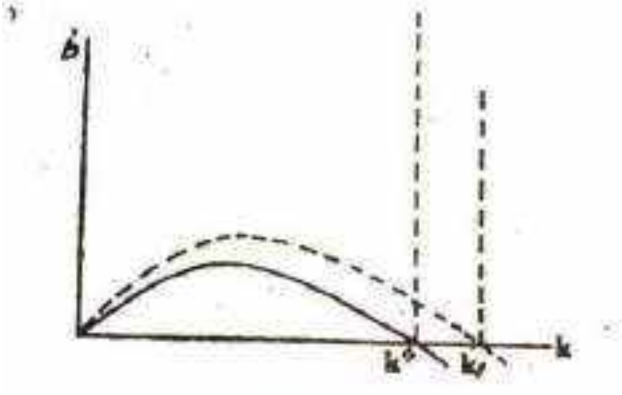


Fig. 18.2

Since investment (1) equals $\frac{dK}{dt}\frac{i}{k}$(gL + λ) the required investment = k (g_t + λ). The rate of investment per unit of effective labour required at any given level of k to maintain that level, of k is then : (gL+ λ) $\frac{K}{E}$ = (gL + 1) *k*. Now in equilibrium, I = S = s Q, or Q = $\frac{1}{s}$and q = $\frac{Q}{E}=\frac{I}{sE}=\frac{1}{E}s$. Since, as explained above, investment (I), per effective worker required at any given level of k to maintain that level equals (g_t + λ) *k*, the level of output per effective worker (*q*) required to maintain that level of *k* is given by

$$\frac{Q}{E}/k=\frac{1}{s}.\frac{I}{E}/k=\frac{g+\lambda}{s}k$$

where k denotes the given value or k

This explains the ray $\frac{g+\lambda}{s}k$ which tells us the output per effective worker required at any given level of *k* to maintain that level of k as E (i.e. effective labour) grows through time. In our Fig. 18.1 the equilibrium value of this (q) is given by, the intersection of the production function *f*(k) with the ray $\frac{gL+\lambda}{s}k$ which represents stable equilibrium. To the left of this point the actual q is greater than the required q. Therefore, k $\left(=\frac{K}{E}\right)$ will tend to increase towards the equilibrium level k*. To the right of this equilibrium point, the actual value of q is less than the required value to maintain the corresponding value of k. Therefore k will tend to fall towards the equilibrium value k* at which the actual q equals the required q to maintain the corresponding level of k (=k*). At this point there will be zero rate of change in k. This is shown in Fig. 18.2. This rate of change in k as shown by the k-curve is zero k=k* where this curve meets the horizontal axis.

Some important results follow from the above. If the economy tends towards stable equilibrium at k* in the long run. this implies that the rate of growth of capital stock (K) equals the rate of growth of effective labour (E) which, by definition equals $g_L + \lambda$ in the long run. It is because equilibrium k* = $\left(\frac{K}{E}\right)$ is constant. Similarly, with output per effective worker (q) tending towards the equilibrium value q*, the growth rate of output (Q) equals the growth rate of effective labour (E) which, by definition, equals $g_t + \lambda$ in the long-run which means that in the long-run equilibrium state of the economy.

(1) $K = Q = g_L + \lambda = n$

(2) $\left(\frac{Q}{E}\right)=\left(\frac{K}{L}\right)=\lambda$

Which means that in the long-run equilibrium the growth rate of output per man equals the growth rate of capital/labour ratio equals the rate of technological progress.

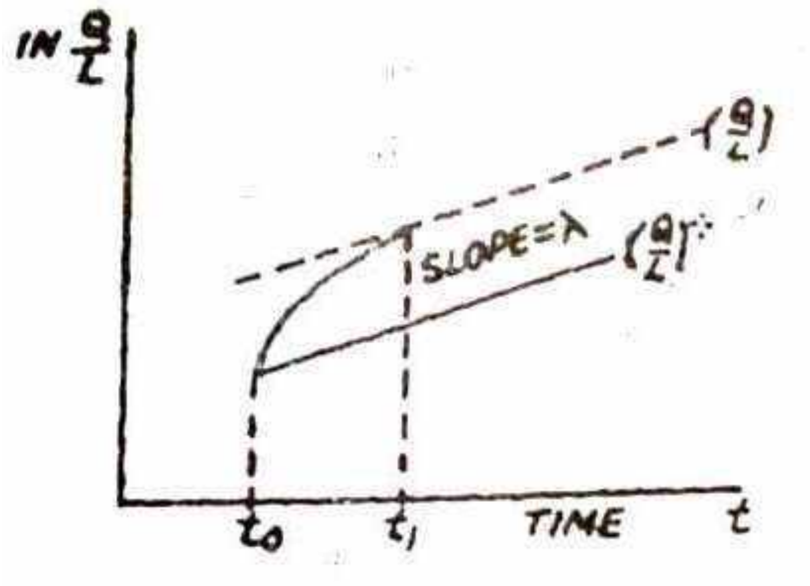


Fig. 18.3

More importantly, the above conclusions also imply that an increase in the saving ratio, s, will shift the long-run equilibrium path upwards while a fall in it will shift this path downwards the long-run equilibrium path of output per man given by k*, q* equilibrium point of Fig. 18.1 above is shown in the following Fig. 18.3.

As the ratio of output to effective labour in equilibrium is q*, therefore $\left(\frac{Q}{E}\right) = \left(\frac{Q_t}{L_{tc} \lambda_t}\right) =$ q*

which means;

$$\left(\frac{Q_t}{L_t}\right) = q\, e^{\lambda t}$$

But q* is constant.

Hence the growth rate of $\frac{Q}{L} = \lambda$

The straight line with its slope = λ in Fig. 18.3 traces the time path of stable equilibrium when saving ratio is s.

Now if the saving ratio rises from s to s_1 the $\frac{gL+\lambda}{s}k$ line in Fig. 18.1, which shows the output per effective worker (q*) in the state of equilibrium necessary to maintain that equilibrium, will rotate downwards as shown by the broken line in Fig. 18.1 This implies that at any given level of k a smaller q will be required to maintain that level of k : a lower q is adequate to generate enough investment to maintain that value of k and thus to keep the system in a state of dynamic equilibrium. At the initial equilibrium k*, the production function, f(k), lies above the $\frac{gL+\lambda}{s_1}$ k line. This means that the growth rate of k (k) is positive (>0) as shown by the broken line in Fig. 18.2 above. Therefore both k and 4 will tend to rise towards their new equilibrium values k, and q, respectively. When k and q are growing, K > E = $g_L + \lambda$. and Q > E= $g_L + \lambda$, and, therefore, $\frac{Q}{L}$(output per man) grows at a rate greater than λ i.e. $\left(\frac{Q}{L}\right) > \lambda$. In other words, over the time when k and q are moving towards the new equilibrium, the growth rate of output per man exceeds λ, the slope of the long-run equilibrium path $\left(\frac{Q}{L}\right)$ in Fig. 18.3. When k and q reach the new equilibrium levels k_t and q_t respectively, a stops growing, Q becomes equal to E and hence $\frac{Q}{L}$ begins to grow, once again, at the rate = λ which is shown by the broken straight line $\left(\frac{Q}{L}\right)_1$ in Fig. 18.3. This line is parallel to the initial $\left(\frac{Q}{L}\right)^*$ line thus showing the same slope and therefore, showing that the long-run equilibrium growth rate of the economy is the same as before the rise in the saving ratio. But now k is higher and output per man $\left(\frac{Q}{L}\right)$ is higher, and $\frac{K}{L}$ will also be higher.

Similarly, it can be shown that when s rises, consumption per man will $\left(\frac{C}{L}\right)$ also rise. (For a full explanation of it look up W.H.Branson's Macroeconomic Theory and Policy, pp. 511.14). The equilibrium $\left(\frac{C}{L}\right)$ lines will be similar $\left(\frac{Q}{L}\right)$ to the lines in Fig. 18.3.

Thus we see that there are different long-run equilibrium paths, each, associated with a particular saving ratio, the higher path signifying higher levels of output, per capita output, K/L ratio, per capita consumption, being associated with a higher saving ratio.

Now we return to our starting question, namely, if there are different equilibrium paths, each of which specifies a given saving ratio, which saving ratio and, therefore, which growth path should be chosen by a society. The Golden Rule of Accumulation of Phelps describes the growth path which, once the economy attains it, will give a higher level of per capita consumption than any other growth path for all times.

It is to be noted that all dynamic equilibrium per capita consumption paths running parallel to one another have constant, but different K/E (=q) ratios. Thus all paths are the golden rule paths in the sense that along each one of them each generation must pass on the same K/E or q ratio that it inherited. Which is the optimum path? The answer to this question in terms of the Golden Rule can be found with the help of a simple explanation given by Solow as follows:

Imagine an economy with free costless capital dispensing with the necessity to save. It can thus freely choose the level of its long-run equilibrium path. As already explained, keeping along a particualr chosen equilibrium path requires that the K/E ratio implied in it and thus freely chosen must be kept up for all times. That is the equilibrium condition. Now, for each increment of capital, AK, there is an increment in the output of the economy equal to :

(1) $\Delta Q = f\,'(k).\ \Delta K$ f (k) denotes marginal return to $\left(\frac{K}{E}\right)$ k

Since the K/E ratio is to be maintained, therefore the capital stock must grow at the same rate at which effective labour (E) increases. Therefore, $\Delta K/K = I/K = gL + \lambda$

Or (3) $I = (gL + \lambda)\ K$

$\therefore$ (4) $\Delta I - (gL + \lambda)\ \Delta K$

Now, as long as the increment in output, ΔQ, exceeds the increment of investment, ΔI, ΔK increment will increase consumption by ΔC. but the marginal product of K $\left(\frac{dQ}{dK}\right)$. that is, f (k) decreases with increments in K. Thus sooner or later the economy will reach a stage when

(5) $\Delta Q = \Delta K f\ (k) = I = \Delta\ k\ (g_L + \lambda)$

At this point, using more free capital will increase the level of investment required to maintain the given equilibrium & ratio more than it will increase output. This implies that. C will have to be reduced to maintain the equilibrium value of k.

The above analysis demonstrates that the original free capital to accept according to the Golden Rule is the amount of K that will equate the ratio of profit If (k) or $\left(\frac{dQ}{dK}\right)$ to the natural rate of growth, that is

(6) $f\ (k) = g_L + \lambda$

At least two more interesting corrollaries can be derived from (6).

Multiplying both sides of (6) by K we get :

(7) $\frac{K}{Q}\ f'\ (k) = \frac{K}{Q}\ (gL + 1) = \frac{1}{Q} = s$

in equilibrium, $I = (g_L + \lambda)k$

While the ratio $\frac{1}{Q}$ tells the proportion of Q invested which in equilibrium equals the saving ratio, s, the left-side term of (7) represents the profit rate [=f (k)] times the capital/output ratio $\frac{K}{Q}$ which can also be written as follows: $\frac{\Pr ofits[f'(k)K]}{capital(K)} \cdot \frac{capital(K)}{Output\,(Q)}$

So that the equation (7) implies that

$$\frac{\Pr ofits}{capital}\ \frac{capital}{Output} = \frac{Investment}{Output} = \frac{Saving}{Output}$$

Thus the second important implications of the Golden Rule is that the Share of profits in output must equal the ratio of investment to output. This Golden rule implication can be stated in the form of an optimal norm : invest all the profits, consume all the wages." This is the principle to determine the optimum saving ratio, s, in terms of the Golden Rule of Accumulation.

The above equation also yields another important K implication. The term f'(k) $\frac{K}{Q}$ in it can be converted into the elasticity of ouptut with respect capital input as follows:

(8) $$\frac{f(k)K}{Q} = \frac{f'(k)k}{q} = \frac{dq}{dk} \cdot \frac{k}{q}$$

Therefore, the equation (7) can be written as follows:

(9) $$\frac{dq}{dk} \cdot \frac{k}{q} = \frac{1}{Q} = s$$

The equation (9) implies that the saving ratio, s, be equal to the elasticity of output with respect to capital in order that the economy may move along the golden rule path.

The conclusions of the Golden Rule thesis may be summarised follows:

In order to attain the k* ratio = $\left(= \frac{K}{E} \right)^*$ which will give the highest longrun equilibrium per capita cosumption $\left[= \left(\frac{C}{L} \right)^* = e^{\lambda t} \left(\frac{C}{E} \right)^* \right]$ the saving ratio, s. must be such that at the equilibrium value of k (k*), the slope of the production function [f (k)] which equals the rate of profit must equal $g_t + \lambda$, that is, the natural growth rate (n). The equilibrium value of [f (k)] of k (k*) that will result from it will be the golden rule equilibrium value of (k*g) that will determine "the equilibrium growth path that maximises consumption per man for all times, once the economy arrives at that path.

Self Check Exercise-3

Q1. Discuss golden rule of accumulation.

18.7 Optimal Growth Turnpikes.

It should be noted that the Golden Rule explained in the preceding section distinguishes between the various long-run equilibrium growth paths in terms of their equilibrium $\frac{C}{L}$ ratio, that is, per capita consumption level on the assumption that the economy can freely choose amongst these alternative paths. The assumptions, in other words, is that such a choice involves no cost. But, if an increase in saving is required to move to the golden rule path, the present generation will have to sacrifice consumption in order to save more for the benefit of future generations. Therefore, the golden rule path the one which maximises per capita consumption) would be the target growth path, only if the costs of moving towards this path are rather small compared to the longer-run benefits promised by this path. This in fact, is the essence of the turnpike theorems of optimal growth.

It was shown in the preceding section that we can find the value of the equilibrium golden rules k (i.e. k*g) which gives the highest possible equilibrium growth path for per capita consumption $\left(\frac{C}{L}\right)^*$.

We also noticed that all long-run equilibrum growth paths are parallel paths having a common slope = $g_t + \lambda$. In the absence of any costs, the society's welfare would be maximised by reaching this golden rule path. But, if there are costs involved, the golden rule path need not be the optimal path maximising the social utility or welfare.

Suppose that an economy is in the state where equilibrum k* values in less than its golden rule equilibrium value k*g so that only a small cost is involved in moving to the golden rule path k*g which may be due to the existing saving ratio being less than that associated with the golden rule path. Moving on to the golden rule path k*g would, then, involve a cost. This cost equals the sacrifice of present consumption necessary for raising the saving ratio to the level associated with the golden rule path. The present generation has to sacrifice for the benefit of the future generation. The "turnpike" theoretic problems is: should this sacrifice be undertaken or not? Should this cost be accepted or not?

The answer to the above question cannot be a categorical one. It depends. Supposing the existing value of k* is very close to the golden rule value k*g and further supposing that the society's time horizon is very long so that it or the authorities taking decisions on its behalf can consider the benefits to many future generations of being on the golden rule path, then, in that case, the optimal policy would be to move as quickly as possible towards the golden rule path. On the other hand, if the initial k* were far below k*g so that a substantial sacrifice of present consumption is involved in order to increase the saving ratio to the level required for the golden rule path and, moreover, if the planners' time horizon is rather short, the optimal policy would be to move rather gently towards the golden rule path.

It is the considerations like the above which underline the importance of turnpike theorems of optimal growth paths. In essence, these theorems suggest that the longer the time horizon, the smaller the percentage of time that should be spent away from the turnpike (i.e. the golden rule path). It is because then the benefits of being near the turnpike would be much greater than the costs of reaching to it.

In general, if the future consumption is not discounted and, therefore, the objective function is to maximise social welfare as an undiscounted function of per capita consumption over a long planning horizon, the golden rule growth path is also the optimal turnpike growth path.

However, a more general turnpike model is the one in which future consumption is discounted and. therefore, a discount rate is introduced into the social welfare integral. As the result of it, since the discont rate is positive, the discounted turnpike path would involve a lower saving rate and lower k value than the golden rule path requires.

The above result can be derived from the simple model of Solow for the golden rule result that we considered towards the end of the preceding section of this lesson.

We, again, assume an economy which can get capital free on the condition that it must maintain forever the ratio (k) it initially accepts. Then the present value of future output gained by accepting an increment of capital is given by

(1) $\Delta Q = f\,(k)\,\Delta K — r\,\Delta K = (f\,(k) — r)\,\Delta K$ where r is the rate of discount.

In order to maintain the $\frac{K}{E}$ ratio as E grows at the rate $n = g_t + \lambda$, an increment to K will require an increment to investment (I) as follows:

(2) $\Delta I = n.\,\Delta K = (g_t + \lambda)\,\Delta K$

Now, the economy with a discounted social welfare integral will want to accept capital with diminishing $f(k)$ until $\Delta K = \Delta I$, giving us

(3) $f\,(k) — r = n = g_t + \lambda$

Which follows by putting equation (1) into equation (2) The equation (3) above is the turnpike condition with future income discounted at rate r. The economy with a long planning horizon should set its saving rate to move fairly rapidly to an equilibrium growth path along which the marginal productivity of capital I/f (k)], inclusive of the negative outputs such as pollution, is equal to the sum of the natural rate or growth ($g_t + \lambda$) and the social discount rate (r), is so far as they can be correctly measured.

Self Check Exercise-4

Q1. Discuss Optimal Growth Turnpikes.

18.8 Summary

Kendrick, Kaldor and Solow, among others have attempted to demonstrate the role of technological change in the growth of on economy. A technical change is said to be neutral when it is neither capital saving nor laour saving. On the contrary, non neutral technical change is either capital saving or labour saving. The neutrality or non-neutrality of technical change can be determined through its effect upon Marginal productivity of factors and Marginal rate of substitution of one factor for the other.

18.9 Glossary

Embodied technical change implies technological improvement in only a specified kind of capital and in the associated labour force. Technical progress increases the productivity of new machines compared with machines made in the previous period.

Disembodied technical change occurs when it is Possible to obtain more out-put from the unchanged inputs of the two factors. There is improvement in the productivity of all the factors or all units of a given factor already existing.

18.10 Answers to self check Exercises

Self Check exercise -1

Ans.1. Refer to Section 18.3

Self Check exercise -2

Ans.1. Refer to Section 18.4

Self Check exercise -3

Ans.1. Refer to Section 18.6

Self Check exercise -4

Ans.1. Refer to Section 18.7

18.11 References/ SUGGESTED READINGS

1. E. Shapiro, Macroeconomic Analysis, Ch. 21
2. W. H. Branson, Macroeconomic Theory and Policy, Ch. 24
3. E.S. Phelps, "The Golden Rule of Accumulation: A Fable for Growth Men", AER, Sept. 1961, reprinted in A.K. Sen (ed.) Growth Economics, Penguins.

4. E. S. Phelps., "Second Essay on the Golden Rule of Accumulation", AER, Sept. 1965

5. K. Shell (ed), Essays on the Theory of Optimal Economic Growth.

18.12 TERMINAL QUESTIONS

1. Explain how the introduction of technological progress affects the neoclassical growth model.

2. Explain the Golden Rule of Accumulation.

3. What are turnpike theorems? How do they differ from the Golden Rule?

*****

Unit - 19

THE THEORIES OF THE PRICE LEVEL

Structure

19.1 INTRODUCTION

The general or the average price level in a money economy is seldom found to be constant. The common experience is that it goes through periods in which it is either rising or falling. Rising or falling prices have often far reaching effects on an economy, since they affect significantly both production and distribution in an economy,, apart from affecting its balance of payments with the rest of the world. It is, therefore interesting and enlightening to go through some important explanations of fluctuations in general price level.

19.2 Learning Objectives :

After going through this chapter you will be able to

- understand the classical theories
- know the Real Balances and the Quantity Theory
- know the implications of the Quantity Theory

- understand the Keynesian Theory
- know the Implications of the Keynesian Theory

19.3 The Classical Theories

The oldest explanation of fluctuations in the general price level is to be found in the classical Quantity Theory of money, the essential idea of which can be traced as back as the French writer Jean Bodin, if not earlier. The basic argument of this explanation was repeated over times by economic thinkers like David Hume, Ricardo, Thornton and others culminating, in more recent times, into what is now known as Irving Fisher's form of the Quantity Theory. Though, in modern times, Friedman has asserted that the Quantity Theory is neither a theory of the price level nor of the income level but is only a theory of the demand for money, yet the fact goes that in the hands of the classicals it was nothing but a theory of the price level.

The Quantity Theory explanation of the determination of the general price level is derived from an indentity famously known as the Equation of Exchange which, in Fisher's form, states: $MV \equiv PT$. The M in this identity stands for the quantity of money in circulation; V is the transaction velocity of money, that is the average number of times a unit of money is exchanged for goods and services during a given period of time; P is the average price level; and T is the total volume of transactions taking place during a given period, say, an a year. It can be easily seen as to why this Equation of Exchange is stated to be an identity. The left side of the equation expresses, in fact, the aggregate money expenditure taking place in the economy during a given period. On the other hand, the right side of it expresses the aggregate money income of the economy the money income received by all the suppliers of goods and services taken together. Since one man's expenditure is another manis income. the aggregate money expenditure (MV) in an economy during a given period must, by definition, equal the aggregate money income. In terms of the national income accounting, this simply implies the accounting identity between gross national expenditure (GNE) represented by MV and the gross national product (GNP) or the gross national income (GNI) represented by PT. In fact, T is usually greater income which, according to the standard practice, we can denote by the letter Y, So, if we replace T in the above version of the Equation of Exchange with Y, we shall have this identity in the following form:

$MV = PY$

But, in that case. V should be interpreted as the income velocity of money, that is, the average number of times a unit of money exchanges for goods and services produced during a given period of time (which is the definition of income. Y) and not for all types of transactions which may include, beside the goods and services produced during the given period, old goods produced in previous periods also. In our subsequent discussion we shall make use of the latter form of the Equation of Exchange rather than the former form of it:

The Equation of Exchange in itself is not a theory but only a tautology, that is, a statement which is true by definition and stands no chance of being refuted even in principle. However, the classicals derived their theory of the general price level from this Equation of

Exchange by making certain assumptions with regard to the behaviour of some of the variable involved in this Equation of Exchange.

They assumed that in equilibrium the level of income the full employment level of income and is therefore, fixed (constant). They also assumed that the velocity of money, which is determined by, institutional factors such as whether wages and salaries and are paid per day per week, per fortnight or per month and whether payments against transactions are done in cash or by cheques. etc., is also constant. Making these behavioural assumptions they derived their theory of the price level as follows:

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

Since Y and V are assumed to be constant, therefore price level (P) is determined solely by the quantity of money in circulation (M) Moreover, the above equation clearly shows that the price level is a direct and proportionate function of the quantity of money. Thus the classical quantity theorists came to the conclusion :The general price level in an economy changes in the same direction and in the same proportion as the total supply of money Doubling of M will double P. and, similarly halving the M will end up with halving the P in the state of equilibrium of the economy.

But how does it come about? This result in the classical theory comes about through two kinds of mechanism, one of which is known as the direct mechanism, while the other is known as the indirect mechanism. Though most of the classical most of the times emphasised the direct mechanism, economists like Thornton also pointed towards the indirect mechanism.

The direct mechanism refers to the process in which any change in the supply of money leads directly to a change in the general price level Suppose the supply of money in the initial state of equilibrium is M_u and the price level is P_n. Now, there is an increase in the supply of money $M_1 = 2M_n$. The classicals assumed that money is demanded only to transact exchange of goods, that is they recognised its function as the medium of exchange only. When the supply of money is increased, it comes into the hands of the people and they find that they possess much more money balances than they require to purchase goods at the existing price level P_n. Thus, the increment in the supply of money disturbs the existing monetary equilibrium, there being now more money balances in the hands of the people than they need, creating a situtation of excess supply in the money market. People will, therefore, try to get rid of their excess holdings of money balances by spending on goods. The aggregate demand for goods will thus rise, But the aggregate supply of goods (Y) is fixed, as it is already at the full-employment level. Thus excess supply in the money market causes excess demand in the goods market. The latter, due to the assumed perfectly inelastic supply of goods, causes a rise in the prices of goods. There is no effect on the output and supply of goods. The goods prices will go on rising till a new equilibrium is attained at a higher level of prices P_1 which is double the initial equilibrium price level P_0 ($P_1 = 2P_0$). Thus, doubling the supply of money doubles the general price level through the above mechanism which is described as the direct mechanism.

The above end result can also come about through an indirect mechanism which refers to a process in which a change in the supply of money first affects the rate of interest and through it affects the aggregate demand for both capital goods and consumers goods and ultimately affects the price level. The increase in money supply will lower the rate of interest which, in turn, will cause an increase in the demand for investment goods. The prices of investment goods will rise. There being full employment of productive resources, the supply of investment goods can be increased only by diverting some of the resources employed in consumer's goods industries to the production of investment goods. This reduces the supply of consumer's goods leading to a rise in their prices also. Thus the prices of all sorts of goods will rise until the new equilibrium is attained when the price level will be found to have increased in the same proportion in which the supply of money had increased.

There is Cambridge version of the Quantity Theory of money also. This version differs from the pure classical and Fisher's version in that the former, unlike the latter, recognises the function of money as a store of value or as an assest form also in which people can hold their wealth. On this basis, the propounders of this version like Marshall, Pigou and Robertson, who belonged to the Cambridge University of England and on account of which this version came to be known as the Cambridge Quantity Theory of Money, gave it the following form :

$$MV = kPY$$

In the above equation M, as earlier, denotes the supply of money ; P is the general price level; Y is real income or output and k is the proportion of the income which the people want to hold in the form of money balances. From this equation, they derived their hypothesis as follows:

$$P = \frac{M}{kY}$$

In the classical tradition, the authors of this version also assumed Y to be fixed at the full-employment level and they also assumed k to be the institutional constant. On the basis of these two assumptions they logically arrived at the classical conslusion that the price level (P) is a direct and proportionate function of the supply of money (M).

It can be seen that k of the Cambridge Equation is but the reciprocal of the income velocity of money (V) of Fisher's equation. Both the versions assume only the transaction demand for money. Money is assumed to be held in order to carry out transactions. Since incomes are received by people at the beginning of the period but are to be spent all over the period, they have to keep a portion of their income in the form of money balances. This porportion (k) is determined by the institutional factors, Let us suppose that an individual's income is Rs. 1000 which he receives at the beginning of every month and which he spends uniform by over a month so that he starts with money holdings of Rs. 1000 and at the end of the month holds only zero amount of money. This means that his average holdings of money during the period are $\frac{Rs 1000 + Rs\, 0}{2}$ = Rs. 500 which is $\frac{1}{2}$ of the income of the period this means that the value of the constant k = $\frac{1}{2}$. On the other hand, an amount of money worth Rs. 500 is used to make purchases worth Rs. 100 which means that a unit of money is used, on the average, twice in order to make exchange transactions. Thus the income velocity of money is 2 = $\frac{1}{\frac{1}{2}} = \frac{1}{k}$. Thus V is the reciprocal of k and k is the reciprocal of v : $\left(k = \frac{1}{v}\right)$

In view of the above explanation, the Quantity Theory can be written in a form incorporating both the versions as follows:

$$P = \frac{M}{ky} \frac{MV}{Y}$$

In Fisher's equation a distinction is made, at the secondary level of explanation, between currency and bank money and the form given to the Quantity Theory is as follows :

$$P = \frac{MV + M'V'}{Y}$$

Where M is the amount of currency and V is its velocity of circulation; M' is the bank money the money created by commercial banks through their lending operations or deposit creation, and V' is the velocity of circulation of this bank money. The above modification of the original Quantity Theory of money corresponds to modern economies with developed banking system. But it makes no difference to the results of this theory, for in this version of Fisher, M', that is, the bank money is assumed to bear a constant relationship with M' or currency, the former being a certain fixed proportion of the latter.

Self Check Exercise-1

Q1. Discuss the classical theories.

19.4 The Real Balances and the Quantity Theory

The explanation of the mechanism through which. according to the classical Quantity Theory of money and prices, a direct and proportionate relationship between changes in money supply and changes in the price level is established, can be given with the help of the concept of the real balances as used by Patinkin. The real balances refer to the purchasing power of the nominal money balances and are therefore denoted with the ratio $\frac{M}{P}$ where M represents the nominal balances and P is the general price level. Any change in the price level, given the amount of M, will change the real balances: A fall in the price level increases real balances, while a rise in the price level decreases real balances. On the other hand, given the price level any change in the quantity of money will change the amount of real balances: A fall in M reduces real balances and a rise in M increases real balances in this case.

According to Patinkin, the demand for nominal balances arises bacause the people desire to keep a part of their real income and wealth in the form of readily available purchasing power as assumed in the Cambridge Quantity Theory. When the money supply is increased at a given equilibrium price level, the real balances in the hands of the people rise above the level which they want to hold at the prevailing equilibrium price level. So they start getting rid of their excess real balances by spending a part of their nominal balances on goods as well as bonds and securities. The increased demand for bonds and securities pushes up their prices also. Since bonds and securities yield a fixed return per unit of time, a rise in their prices amounts to a fall in the rate of return yielded by them. In other words, the rate of interest falls which in turn increases, the demand for investment goods and consequently their prices rise. The system goes into disequilibrium. The demand for goods goes an increasing pushing up their prices and the demand for bonds and securities also goes on increasing resulting in the falling rate of interest till a new equilibrium at a higher price level is established.

A decrease in money supply, by reducing real balances, will start the process in the reverse gear. Prices of goods and bonds will start falling. Fall in bond prices will raise the rate of interest and thus reduce demand for investment goods and, therefore, their prices also. The process will go on till the price level falls in the same proportion in which money supply is decreased.

Self Check Exercise-2

Q1. Discuss the real balances and the quantity theory.

19.5 The Implications of the Quantity Theory

There are some important implications of the Classical Quantity Theory of the price level which are in fact, related to its underlying assumptions.

In the first place, the theory implies that the demand for money as the function of its value or purchasing of power has unit elasticity. The value of money, that is, its purchasing power equals the reciprocal of the price level and thus it indicated by $\frac{1}{P}$. The demand for money, as already indicated, is assumed to come from the transaction motive. The demand function for money which can be derived from the Quantity Theory can be written as follows:

$$M_d = \frac{1}{v} . PY = kPY$$

If the demand for money is to be interpreted as the demand for real balances rather than nominal balances as such, then the above equation will have the following form:

$$\left(\frac{M}{P}\right)_d = \frac{1}{v} . V = ky$$

The above equation can also be written as follows:

$$M_d \left(\frac{1}{P}\right) = \frac{1}{v} . Y = kPY$$

Since V or its reciprocal k is a constant and Y, the full-employment level of income, is also a constant, the above is of a rectangular hyperbola of the type xy = constant which has a unit elasticity over it. Thus, if we plot the demand for nominal balances (M_d) along the borizontal axis and the value of money $\left(\frac{1}{P}\right)$ along the vertical axis, we shall get the demand curve for money which will be a rectangular hyerbola showing unit elasticity of demand for money.

Secondly, the theory implies that a change in the quantity of money has no effect at all on the real output of the economy, the whole impact is on the prices. This follows from its assumption of a unique equilibrium at the full-employment level. In equilibrium the real output, that is, real income is constant. But, if we accept the equilibrium can take place at less than full employment level also, the Quantity Theory itself can imply that an increase in money supply need not have the whole impact on prices but it may also increase output. In fact, if the elasticity of output is infinite at less than full employment level, the whole impact of an increase in the supply of money would be on the output and there will be no impact at all on prices.

A corrolary of the above-said assumption of the Quantity Theory is that the real output is determined only by the real factors such as the quantity and quality of the available productive resources and the available technology. Changes in money supply do not affect the real output of the economy and other real variables; they only determine their nominal values such as money wage rates, the money rate of interest and money income and money prices of goods. They do not affect even the relative prices of goods which implies that all demand and supply functions are assumed to be homogenous of zero degree in money prices and money income.

The above leads to the further implications that real outputs of goods, their demand and supply, their relative prices and real income received by the suppliers of factor services, etc., are all determined by real factors alone. On the other hand, the general (the average or the absolute) price level is determined by the quantity of money alone, that is by monetary factors alone. Thus, the Quantity Theory of prices implies a dichotomy known as the classical dichotomy in the classical economic theory. We have already discussed it in an earlier lesson. (See lesson 2)

A further implication of this theory, to which we have already referred in an earlier lesson, is that money is neutral which automatically follows from the above arguments.

Lastly, there is the implication or the assumption implied in the classical hypothesis of neutrality of money, namely, that a change in money supply does not change the distribution. This plies that the Quantity Theory implicitly assumes that a change in money supply is a "neutral" change in the sense that it changes the money balances in the hands of all the individuals in the same proportion so that the distribution remains unaffected.

Since most of the above implications are not borne out by the facts of the real world, the Classical Quantity Theory may not be valid.

Self Check Exercise-3

Q1. What are the implications of quantity theory.

19.6 The Keynesian Theory

The Keynesian approach to the analysis of the determination of the general price level is known as the income expenditure approach which can be found in the analysis of the Swedish economist, Knut Wicksell, of the late nineteenth century neoclassical school. The essential argument in this approach is that the general price level is not determined by the supply of money directly as supposed in the classical theory. It is rather determined indirectly through its effects on the aggregate effective demand. Moreover, this approach assumes that the aggregate effective demand or which is the same thing the aggregate expenditure in the economy is affected by changes in the quantity of money suplied not directly but indirectly through their effect on the rate of interest.

At a very simple level of it, the Keynesian theory argues that an increase in money supply will have no effect on the price level when the economy is in a state of less than full employment equilibrium. The argument is that in such a situation a lot of unemployed productive resources and excess productive capacity are available. On account of it, the elasticity of output is infinite which means that the aggregate supply of goods is perfectly elastic. The supply of labour is also perfectly elastic due to the widespread high level of unemployment so that any increase in the demand for labour will have no effect on the real wage rate. In such a situation, if the supply of money is increased, it will first have the effect on the rate of interest which will be lowered. The fall in the rate of interest will shift the consumption function upwards indicating a higher consumption expenditure at any given level of income. However, the much more important shift that will be caused by a fall in the rate of interest is the upward shift of the investment function. The fall in the rate of interest will make the marginal efficiency of capital (MEC) and consequently the marginal efficiency of investment (MEI) greater than the rate of interest. This makes additional investment profitable. On account of it, at given level of income, there will be more investment at any diture as well as increase. Thus there is increased consumption expenditure as well as increased investment expenditure in the economy leading to a rise in the aggregate expenditure to a much greater extent due to the multiplier effect of these changes on the level of income and expenditure. The aggregate demand for goods and services increases.

However, the increased aggregate demand for goods will not result in any rise in the price level, because the supply of goods and services is perfectly elastic as is also the supply of labour. The whole impact is thus on the level of outputs or real income and there is no impact of the increase in money supply on prices. The prices remain cosntant.

But, once the economy attains the state of full- employment equilibrium, the classical Quantity Theory, according to Keynes, comes into its own. At this stage no idle productive capacity is available and no involuntary unemployment exists. Consequently, the labour supply function as well as the aggregate supply function becomes vertical showing zero elasticity of output. Now, if, there is an increase in money supply resulting in a fall in the rate of interest and consequently in a rise in the aggregate expenditure in the economy showing increased demand for goods and services, the increased demand cannot be met by increased supplies, as supply functions are now perfectly inelastic. On account of it, the whole impact is on the prices and there is no impact on the output which is the proportion that we came across in the classical Quantity Theory. It is in this state, that is, after full-employment has been attained that there is, according to the Keynes, true inflation.

However, the above is only a simplified and abstract version of Keynes's theory of income and prices. The hypothesis that in a state of underemployment equilibrium, an increase in the supply of money has absolutely no impact on prices and has its whole impact on output crucially depends on the assumption of perfectly elastic supply function of labour and supply functions of goods as well. This assumption to be valid requires a number of other assumptions to which Keynes himself referred in his General Theory as follows.

(1) It is assumed that all unemployed resources are homogeneous.

(2) Unemployed workers are willing to work at the prevailing money wage rate as long as unemployment is not completely eliminated and full employment is not attained.

(3) There are constant returns.

(4) Resources are prefectly substitutable.

(5) The aggregate demand increases in the same proportion as the money supply.

The Keynesian argument that changes in money supply do not affect prices at all as long as there is less than full employment, after which they affect prices alone and not output is sometimes referred to as the reformed version of the Quantity Theory. But it can be seen that this so-called reformed version of Quantity Theory can be valid only if the above assumptions are fulfilled.

Keynes was quite aware of the abstract nature and the limitations of the above simple explanation of the relation between money and prices. Even in a state of less than full-employment equilibrium, (1) the aggregate effective demand may not change in the same proportion in which the supply of money changes, (2) productive resources în reality are not homogenous and therefore not perfectly substitutable, therefore diminishing returns and increasing costs rather than constant returns and constant costs will actually prevail, (3) it follows from (4) above that supply functions will not be perfectly elastic even when elastic, when unemployed resources are present, or, at least, some of them may not be elastic which may create bottlenecks; (5) the real wage rate may rise even before full employment and (6) the factor prices entering into the marginal costs need not change in the same proportion.

On account of the above complicating factors an increase in money supply, by causing a rise in aggregate effective demand, will change both the level of output and the level of prices even when there is less full employment. Thus, referring to the above mentioned five complicating factors, Keynes himself had observed in his General Theory: "The Theory of prices, that is to say, the analysis relation between changes in the quantity of money and changes in the price level with a view to determining the elasticity of prices in response to change in quantity of money must, therefore, direct itself to the five complicating factor, set forth above".

In any case, Keynes believed that the above complicating factors are likely to assert themselves with the result that costs of some complementary factors, at least, may begin to rise while there is still unemployed labour available. In this case, even when the workers are willing to work at the ruling wage rate, the costs will start using and supply curve as of goods will begin to slope upwards which implies that the price level will rise along with increase in output. But since the output elasticity is not zero, as supposed in the Quantity Theory, an increase in the supply of money will not lead to proportionate rise in the price level. Keynes referred to this type of rise in the price level as bottleneck inflation.

Self Check Exercise-4

Q1. Discuss the Keynesian theory.

19.7 Implications of the Keynesian Theory

Some of the important implications of the Keynesian theory of prices are as follows, Firstly, the theory clearly implies that money is not neutral, specially in a situtation of unemployment. An increase in the supply of money has a definite determining influence on the real variables, such as output and employment, and also on the real rate of interest and even the real wage rate. We have already seen that an increase in money supply the aggregate effective demand as the result of which there is more employment and large output. We also saw that an increase in money supply lowers the money rate of interest and prices remaining the same, the real rate of interest also falls which, in turn, affects both real investment as well as real consumption.

Secondly, it follows from the above the economic theory cannot be divided into two separate water-tight compartments, one part consisting of the theory of value and distribution or relative prices where only the real factors count, and the other part consisting of the monetary theory or the general or the absolute price level in which only monetary factors count. Thus, Keynes's theory of prices, in a way, eliminates the classical dichotomy by integrating the value theory and the monetary theory.

Thirdly, as demonstrated in the preceding section. Keynes's theory refutes the proportional relation between changes in money supply and the general price level hypothesized in the classical Quantity Theory of money and the prices and by so doing it refutes some of the important implications of the classical theory of money and prices. It refutes, for example the implication, that the demand for money has unit elasticity. The proportional relationship between changes in money supply and the general price level can be held only if. firstly, a change in money supply leads to proportionate change in the aggregate demand, that is, if the elasticity of aggregate effective demand or aggregate expenditure in the economy with respect to change in money supply is unity $\left(\frac{dD}{dm} . \frac{M}{D} = 1 \right)$, where M is money supply and D is aggregate effective deman). Secondly, the prices must into also change in the same proportion in which the aggregate effective demand changes in response to the given change in money supply, that is, the elasticity of prices with respect to aggregate demand must also be unity (i.e. $\frac{dP}{dD} . \frac{D}{P}$ must be unity). This latter condition can be satisfied either if the elasticity of output with respect to change in the agrregate demand is zero, that is, if $\frac{dY}{dD}.\frac{D}{Y}$ (Y reperesnts output here) or if the money

wage rate increased in proportion with aggregate effective demand, that is, if $\frac{dW}{dD}.\frac{D}{W}=1$, elasticity y of the money wage rate with respect to aggregate effective demand is unity. But either of these two conditions implies that output must remain constant despite an increase in money supply. But the implication of Keynes's theory is that these conditions cannot be satisfied when there is substantial unemployment in the economy in the which case money wage rate is most likely to remain constant rather than increase, not to speak of its increasing in proportion with increase in aggregate demand. And, when excess capacity is available, an increase in aggregate demand consequent upon a given increase in money supply must increase output.

In views, of the above arguments, an important policy implication of Keynes's theory is that monetary policy can, in principle, be useful in eliminating unemployment and bringing about full or near-full employment. However, Keynes was not too hopeful about its effectiveness during depression. Firstly, since in his theory money output and employment through its effect on the rate of interest, the monetary policy may not work if the rate of interest is already at a level where there is liquidity trap. Moreover, even if the rate of interest is above the liquidity trap level, the monetary policy may not be of much, use if the required rate of interest for full-employment equilibrium is less than the liquidity trap interest rate. Even otherwise Keynes believed the interest elasticity of investment to be rather too small for the monetary policy to have very effective results. Therefore, his preference was for fiscal measures to control output and employment. However, in situations of what he described as true inflation, he did concede that monetary policy might be relativity more effective.

Self Check Exercise-5

Q1. What are the Implications of the Keynesian theory.

19.8 Summary

Ever since the begining of Economics as a science, economists have been concerned with the theory of value explaining that it is determined by the intersection of the supply and demand curves and the elasticities of these curves influence prices significantly. However, the value of money, we are told, depends on the Quantity theory of money, which constitutes an important pillor of the classical macro theory, states that any change in the Quantity of money Produces a Proportionate change in the same direction in the general level of prices. In other words, the Quantity theory of money states that the value of money is a function of the supply of money such that when the supply of money is doubled its value is halved and vice versa. The conclusion is based on the assumption of full employment given aggregate output. The causal relationship between changes in the supply of money and the level of prices constitutes the care of the Quantity theory of money. In the classical economic system, money has no inherent utility and it is exclusively demand for transactions purposes.

19.9 Glossary

Keynes's theory of prices is superior to the old Quantity theory of money. While according to the old Quantity theory of money, every increase in the money supply is necessarily the cause of price rise, Keynes's theory of prices exposes the Quantity theory fallacy by stressing the fact that money inflation will result in price inflation only after full employment is reached. So long as there exist unemployed resources in the economy. Increases in the Quantity of money will increase employment and not prices. As a guide to practical policy, Keynes's theory of prices stresses the desirability of deficit financing by creating more money to remove the rot of unemployment from the economy. The theory relieves policy makers of the false fear of inflation when the economy is caught in the whire pool of depression. But it warns us to guard against inflation as soon as full employment is reached.

19.10 Answers to self check Exercise

Self Check exercise -1

Ans.1. Refer to Section 19.3

Self Check exercise -2

Ans.1. Refer to Section 19.4

Self Check exercise -3

Ans.1. Refer to Section 19.5

Self Check exercise -4

Ans.1. Refer to Section 19.6

Self Check exercise -5

Ans.1. Refer to Section 19.7

19.11 References/SUGGESTED READINGS

1. Gail F. Makinen Money. The Price level, And Interest Rates part I & II
2. J.M. Keynes, The General Theory of Employment, Interest and Money Ch. 21.
3. A.H. Hansen, A Guide Keynes Ch. 11
4. D. H. Robertson. Money, Ch. II
5. ML. Burstein, Money, Ch. II

19.12 TERMINAL QUESTIONS

1. Explain and examine the Quantity Theory of money and prices.

2. Explain the Keynesian theory of money and prices. How does if differ from the classical theory?
3. In what sense Keynes can be regarded as having reformed The Quantity Theory?

******

Unit-20

THEORY OF INFLATION (1)

Structure

20.1 Introduction

Inflation, which today confronts the Policy markers throughout the world in the form of dominant economic problem, is by no means a new phenomenon because from the earliest days of recorded story mankind has been puzzled and discomfited by rising prices. Throughout the ancient period, the Mediterranean civilizations frequently experienced higher prices in terms of mettatic currency due to the discoveries of new mines and the improved methods of mining gold. The early Mediterranean wars also caused inflation as result of the release of hoards of metallic money accumulated though pillage. The capture of the Persian gold hoards by Alexander the Great was perhaps the Largest single inflationary act of the ancient period. Acquisition of substantial gold and silver hoards by the conquering Roman Emperors also had inflationary impact in the Kingdom. The Frequent debasements of coins in Ancient China, Greece and Rome resulted in inflation. The Metallic inflation which followed the discovery of America constituted one of the most important instances of inflation in history.

20.2 Learning Objectives

After going through this chapter you will be able

- To Define Inflation
- To know the types of Inflation
- To understand Demand Pull Inflation
- To know the Keynesian Model of Inflation
- To understand Bent Hansen's Model of Inflation.

20.3 Definition of Inflation.

The first task in a theoretical study of inflation is to known what the concept of inflation exactly means. Generally, the term, inflation, is sought to be defined with reference to the general level of prices which, as a matter of fact, is layman's way of looking at it rather than that of a trained economist. In this sense, inflation is defined as a phenomenon in which the general price level is rising with the consequent depreciation of the internal as well as external value of the monetary unit. Such a definition, though plausible, is not quite precise. Prices may rise, for example, on account of new goods entering the market (e.g. synthetic cloth where formerly, say, only cotton cloth was available). Or, they may rise because of an improvement in the quality of already existing goods (e.g. superior fine cotton cloth replacing the coarse varieties of it). Prices may also rise on account of changes in the consumption habits of the people. The definition of inflation in terms of the rising- price level, as such will suggest that such increases into the price level indicate presence of inflation, while, in fact, such increases are not inflation in its true economic sense. Conversely, when due to the prevalence of price controls, price level in the open market is not allowed to change, does it mean that there is no inflation? This raises the question which price level is to be taken into consideration in order to decide whether inflation exists or not: the open-market price level or the black-market price level? And, supposing price controls are there but black-market is not allowed to develop, will there be inflation or not? In fact, there may exist in such a situation what the economists describe as repressed inflation, even though the price level is not rising at all.

In fact, a definition of inflation stated in terms of the price level as such ignores a number of other complicating factors also. For example, where taxes and. subsidies are used widely, should the prices be taken gross or net of such taxes and subsidies? Similarly when prices are rising following destruction and disruption due to war, floods, earthquakes, etc., shall we consider such a rise in prices as inflation ? Should a rise in the price level be considered inflationary, even if it is accompanied by a rise in output and employment. And, then, there is the case when due to technological progress, productivity increases but the prices remain constant or even fall to some extent so that profits are inflated, should or should not we consider this as situation of inflation?

The above seems to suggest that a definition in terms of a rising price level is not quite satisfactory. A couple of alternative defations have also been put forth. According to one these, inflation is a condition of generalised excess demand in which "too much money chases too few goods". As we shall see, this definition is associated with the demand-pull theory of inflation according to which inflation can never take place unless there emerges a situation of excess demand. This definition also is quite unsatisfactory, because it rules out inflationary situations arising from the side of supply in the form of what is described as cost-push inflation. Another definition, of which, again, seeks to describe the situation of inflation from the standpoint of aggregate demand is that it is a rise of the money stock or money income, either total or per capita. This definition is associated with the 'neutral money' school in whose opinion any such increase in money stock raises the general price level without changing the relative prices. Other definitions seek to define it with reference not only to the price level but also to some additional factor or factors, such (i) it is incompletely anticipated; (ii) it does not increase employment and real output; (iii) it is faster than some 'safe' rate; (iv) it arises from the side of 'money'; (v) it is measured by prices net of taxes and subsidies; (vi) it is irreversible. Sometimes it is also defined in terms of the exchange value of the currency. In the last of the above mentioned cases, it is defined as a fall in the external value of money as measured by foreign exchange rates, by the price of gold or as indicated by the excess demand for gold or foreign exchange at the official rates.

A definition of inflation, which is unusually comprehensive and is relatively more satisfactory, has been by given Turvey in his 'Some Aspects of the theory of Inflation in a Closed Economy' (Economic Journal, Sept. 1951). He defines it as "the process resulting from competition in attempting to maintain total real expenditure and/or total output at a level which has become physically impossible, or attempting to increase any of them to a level which is physically impossible".

The qualitative results of most of these definitions are common. But inflation, when defined in terms of rising prices, refers not to the higher level of prices as such but to the process of persistently rising prices. Because it is a persistent rise in prices. Casual rise in prices due to random factors is not inflation. Because it is a process, it is dynamic in nature.

Self Check Exercise-1

Q1. What do you know about Inflation.

20.4 Types of Inflation

In the light of what has been said above, it should not be difficult to understand that there can be more than one type of inflation. It may be asked there is any meaning in making distinction between various types of inflation, for the plain fact is that inflation is inflation to whatever type it may belong and all types of it have, more or less, the same qualitative results. However, despite it, it is useful to distinguish between different types of inflation, first, because their quantitative effects might be different, and, secondly, because if we have to formulate an anti-inflationary policy, we must first be able to distinguish between the different types of inflation so that an appropriate type of policy to fight it may be evolved. Before we are able to prescribe remedy for the disease of inflation, the disease itself has to be properly investigated to know its etiology, It is such an investigation which leads us to the conclusion that there is not one but different strains of this particular economic disease and, not infrequently, these strains might even be found in a mixed form. Hence, it is quite necessary to distinguish between different types of inflation.

Types of inflation may be classified on more than one basis. But the classification which is analytically important divides inflation broadly into two types: demand-pull inflation, and (ii) the cost-push inflation. Sometimes a third type, described as the structural inflation, is also thrown in.

Self Check Exercise-2

Q1. Discuss various types of Inflation.

20.5 Demand-Pull Inflation:

Basically the process of persistenly rising prices, whether it is a creeping process or a galloping one, whether it is an open phenomenon or a repressed or a suppressed phenomenon, is due to a continuous imbalance between aggregate demand for and the aggregate supply of real output. When the aggregate demand increases, while the aggregate supply of goods either does not increase at all or increases at a relatively lower rate then the aggregate demand, the more powerful force of demand has the effect of 'pulling' the prices of goods upward in a continuous process. Such an inflation is usually referred to as the 'demand-pull' inflation. An idea of the demand-pull inflation can be had from fig. 20-1

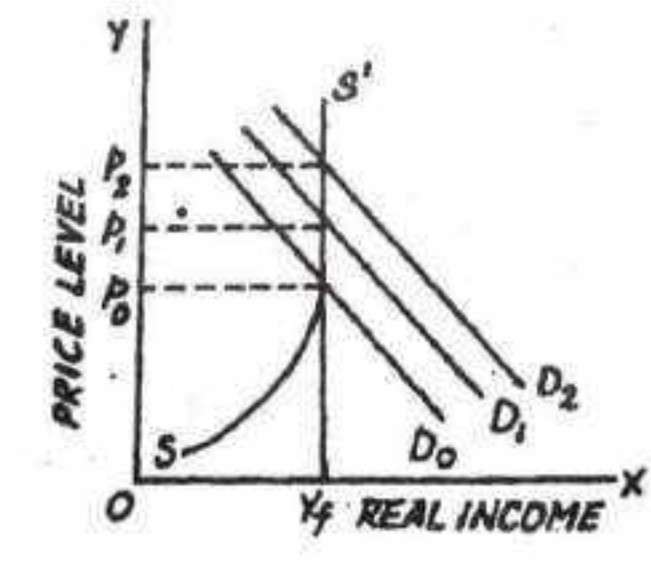


Fig. 20.1

The X-axis in Fig. 20-1 represents' real output or income. Yf is the full-employment level of the real income at which the aggregate supply (out-put) curve SS' becomes vertical. Y-axis represents the price level. D_o, D_1, D_2, ... represent different levels of aggregate demand in real terms which is an inverse function of the level of prices. Therefore D_o, D_1, D_2,.................. have negative slope. Any given level of the D-function, such as D_o, D_1, D_2, etc. presumes a given amount of nominal money and the negative slope of the aggregate demand functions, D_o, D_1, D_2, ... show Patinkin's real balance effect. According to this effect', a rise in the price level, nominal cash balances remaining the same reduces the real balances. Since, according to Patinkin, demand for holding balances, is in fact, a demand for holding real balances, people tend to add to their nominal cash balances as their real value falls with a rising price level. Because the total nominal money is assumed to remain the same, therefore adding to nominal cash balances by the public to restore their real value involves cutting down on their expenditures. It is thus that Patinkin's real balance effect accounts for the negative slope of D_o, D_1, D_2, ... in fig. 20-1. The negative slope of these D-functions also implies static price expectations, that is, it is assumed that future price rises are not anticipated, It is also conceivable that a rising price level may make the distribution more unequal and may thus result in a downward shift of the consumption function. This is an additional factor accounting for the negative slope of the D-functions.

Now, let us suppose that the total quantity of money in the system is such that D_0 is the relative D- function. In this case the price level is P_0 and supply or real output equals the full-employment level. If the quantity of money in the system is increased, the people find that they have now larger real balances with them (more nominal balances with the same price level p_0) than they desire to hold. So they will try to bring their real balances to the desired level by spending a part of their nominal cash balances on goods and services. The D-function is thus shifted upward from D_0 to D_1 and the price level is also pulled up to the level P_1. Any further rise in the aggregate demand shifting the D-function still higher to a position like D_2, will further pull up the price level to a position like P_2 and thus the process may continue.

The above is a simple case of what may be described as the pure demand-pull inflation.

A number of models of demand-pull inflation have been put forth. The earliest of all these is the classical model embodied in the Quantity Theory of Money which we have met earlier too. The Quantity Theory of the general price level is represented in the equation: $P = MV/Y$. Since V, the velocity of circulation of money, and Y, the real output at full employment, are assumed to be constant P, the price level, becomes a direct and proportionate function of quantity of money. Since, in this model, real output, Y, is constant. The demand for money is also constant as, in this model, money is demanded to be used only as a medium of exchange and thus the demand for money is function of the level of real output alone. Since real output remains constant at full employment level, the demand for money also remains constant. Therefore an increase in money supply leads to excess holdings of money, to get rid of which people increase their expenditures. The aggregate demand increases but the real output stays put. So the price level is pulled up. Price level is increased exactly in proportion to the increase in the quantity of money.

The above Quantity Theory explanation has been dubbed as 'naive' by Ackley who thinks that it does not throw light on the mechanism through which an increase in money supply creates a situation of excess demand which pulls up the price level. But we have seen that it does suggest at least a part of this mechanism manifesting itself in increased expenditure. It is admitted. However, that it did not suggest the full mechanism. The deficiency cy was overcome by the refinements introduced by the neoclassical economists like Knut Wicksell who gave a remarkable account of the mechanism through which increased money supply causes a rising price level (cf. his Interest and Prices) Suppose there is full employment and the banking system increases the supply of money. The banking system can persuade the public to accept the increased supply of money only through a reduction in the rate of interest. Or, the same effect of an increased supply of money on the rate of interest can be explain in terms of Patinkin's real balance effect too. As already noted, when the real income remains the same, an increase in the quantity of money increase the real balances with the public, for they now find, in their hands, larger nominal cash balances, while the price level is still at the old level. So they try to get rid of the unwanted money by spending on goods, as explained in the preceding paragraph, or/and by buying bonds. The latter pushes up the bond prices and lowers the rate of interest.

Wicksell described this rate of interest as the money rate of interest. He distinguished it from the real rate of interest by which he seemed to imply the rate of interest which equates the full-employment level of savings with the full-employment level of investment and this also implied that the real rate of interest equals marginal productivity of investment. As the money rate of interest fall in relation to the real rate of interest, investment expenditure is stimulated. For the market or money rate of interest is less than the marginal productivity of capital. This increases the demand for investment goods. But, as there is already full employment, the supply of investment goods cannot be increased except by raising their prices so that factors of production are attracted from the consumer goods industries to the investment goods industries. This reduces the supply of consumer goods and raises their prices. The people are thus "forced" to consume less and save more. Incidentally, it implies that in situations of full employment, inflation can be employed as a means of capital formation. Since the prices of factors of production increase, it ultimately shows up in increased money incomes. As money incomes are increased, the demand for consumer goods also increases which augments the increase in the aggregate demand. Thus a situation of excess demand develops and the general price level is continuously pulled up until the marginal productivity of investment falls sufficiently or/and the money rate of interest rises again due to a restrictive policy of the banking system to an extent sufficient to equate the money rate of interest and the real rate of interest.

During the World War II and after it, the models of demand-pull inflation have been further refined. A restatement of the Quantity Theory approach was put forth by Warburton in his "Misplaced Emphasis in Contemporary Business Cycle Theory". He demon-started that changes in the supply of money are the causal force in the fluctuations of the price level, partly directly (because increase in Money directly raise not only income but also price level) and indirectly-through its effect on the velocity of circulation too (because change in M may cause to change V which, in turn, may change income as well as the price level). Another development has been the introduction by Friedman (cf. his "Restatement of the Quantity Theory of Money") of a quantifiable "expected rate of price change" as a major determinant of the velocity of circulation of money. The relative stability of the resulting velocity function, while the velocity itself increased tremendously, was demonstrated by Cagan's study of seven hyperinflations (cf. Cagan, "The Monetary Dynamics of Hyperinflation" in Friedman (ed.) Studies in the Quantity Theory of Money. A typical postwar monetarist position on inflation is provided by Friedman in his A Programme for Monetary Stability where he maintains that money stock rather then the income flow determines both the price level as well as the level of economic activity. Many countries in the postwar period, he argues, pursued "cheap money" policies. Every such country experienced either open inflation of a network of controls designed to suppress the inflationary pressure. In every case, the stock of money rose as a result of the cheap-money policies and so did the price level. He observes, "No country succeeded in sterling inflation without adopting measures directed at restraining the growth of the stock of money. And every country that did hold down the growth of the stock of money succeeded in checking the price rise."

Although Wicksell had pointed to the increase in the supply of money, which causes the money rate of interest to fall below the real rate of interest and thus to start a cumulative process of rise in prices, as the initiating cause of an inflationary process, the focus of his analysis was on income and expenditure. Consequently the antecedents of both the modern Quantity Theory approach as well as the Keynesian income-expenditure approach to the demand-pull inflation may be found in Wicksell's analysis. An essential difference between the two approaches is that while the monetarists like Friedman emphasise the money stocks as the causative factor, the Keynesian income-expenditure approach emphasises the flow of income and expenditure in the analysis of inflation.

We have tried to give, in the preceding section of this lesson, a broad view of the monetarist models of the demand-pull inflation. We shall now consider some salient features of the Keynesian model of inflation.

Self Check Exercise-3

Q1. Diagramatically discuss Demand pull inflation.

20.6 The Keynesian Model :

The basic Keynesian income-expenditure approach to the analysis of inflation is to be found in a series of articles by Keynes which were subsequently published as How to Pay for the War. Just as Keynes had shown is his General Theory, how the equality of income and expenditure could take place at less than full employment such that under-employment maintained by an excess of the full-employment savings over the full-employment investment, even so he showed, in the said articles, that inflation could result from the fact that, under certain circumstances, the reverse would be true, that is, at full employment there might be an excess of planned expenditure over income (or, alternatively, excess of planned investment over planned saving) which would pull the prices up. The excess of planned expenditure over income at full employment has been christened as the inflationary gap." and the analysis of inflation in terms of this gap has come to be known as the "gap analysis".

The Keynesian version of the demand-pull inflation, in its elementary form, may be presented in a conventional "Keynesian cross' as in fig. 20-2. In this figure C+I+G line is aggregate expenditure line. XX represents aggregate production capacity at full employment expressed in terms of prices of the initial period. OF (=OX) is full-employment income in the same units, i.e., in terms of the price level of the initial period.

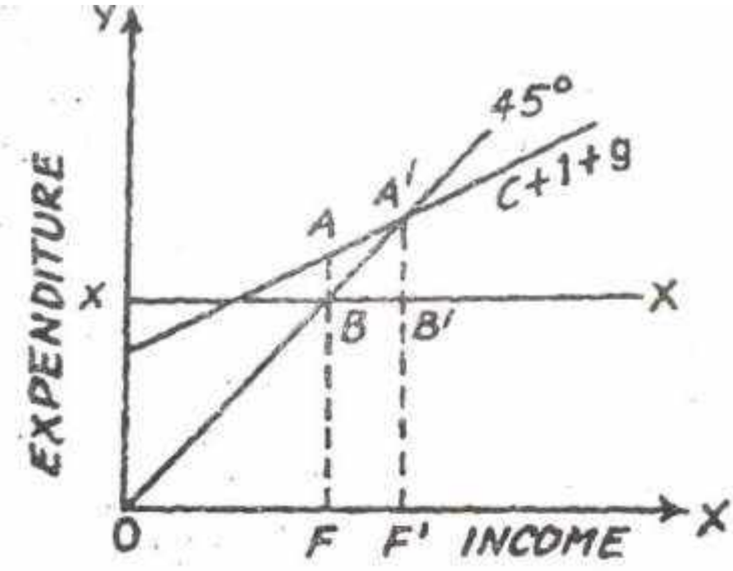


Fig. 20.2

The aggregate expenditure (C+I+G) at full- employment level of income, OF, is FA, which exceeds the full-employment capacity OX (=OF), giving rise to the gap AB, which is described as the "inflationary gap". Due to the force of this 'inflationary gap" prices are pulled up, for the aggregate demand (C+I+G) exceeds the aggregate supply OX (=OF). In terms of the elementary Keynesian theory of income determination. A represents the equilibrium position of the economy under the condition depicted in Fig. 20-2. Real income in terms of the initial price level cannot exceed OF (=OX), the full-employment capacity output. Therefore the income rises to the equilibrium level OF' (=F'A') only in money terms through a process of inflation. The degree of inflation is measured by the ratio, A'B' / OF or AB/OF

The above interpretation of the representation in Fig. 20-2 is rather too simplistic. Difficulties with this kind of presentation become apparent as soon as we try to lebel the axes of the above Fig. 20-2. If income and expenditure are represented in real terms no equilibrium price level will emerge and inflation will continue indefinitely, so long as the gap persists. On the other hand, if income and expenditure (but not the capacity line XX) are represented in money terms, the stability of the aggregate expenditure (demand) curve C+I+G, as a function of income alone is highly questionable, unless the inflation is both small and short.

An advanced Keynesian analysis, making a substantial use of different equations to recast Keynesian theory in dynamic terms, was designed primarily to find out the determinants of the speed and stability of the inflationary process. This analysis posed and tried to answer the question: will an inflationary process, once under way, peter out, when a new and higher price level has been attained, or will it continue indefinitely and take the form of hyper-inflation until the system breaks down? To answer such a quation one is to analyse and find out whether the gap between real expenditure and the fixed level of real output is widened or narrowed as a result of the impact of real-balance effect, money illusion, progressive taxation, lags, etc. behaviours of consumers, business and the government, The stability is achieved eventually only if the rising prices serve, in effect, to reduce the real demands of these sectors so that they do not add to more than the output. This point is illustrated in Fig. 20-3.

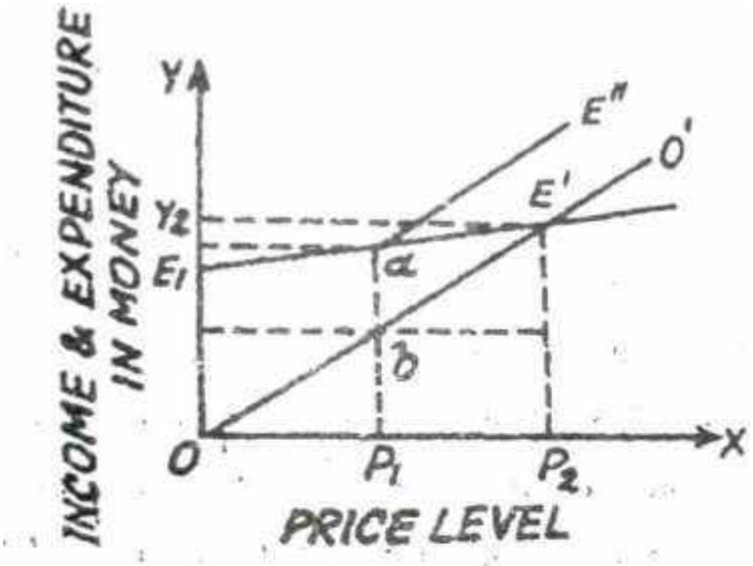


Fig. 20.3

OO' in Fig. 20-3 represents the proportionate relation between the money value of the constant and full-employment real output and the price level. The money value of the constant real output or income is represented along the vertical axis and so is the money expenditure. Price level is represented along the horizontal axis.

Let real expenditure C+I+G be a function of both, the real income as well as the price level. Increase in the price level is a function of the inflationary gap represented by ab in Fig. 20.3. If rising prices cause real expenditure to decline as a result of factors mentioned above, such as the real balance effect, money illusion, progressive taxation etc., the aggregate expenditure curve will follow a path like aE' with the inflationary gap eliminated at E'. If, on the other hand, rising prices do not reduce real demands, the expenditure curve will follow a path having a slope equal to or greater than OO'. For example, it may take the path aE". in Fig. 20.3 above. aE" runs parallel to OO', so its slope is the same as that of OO'. In such a situation, the inflationary gap is never eliminated.

Self Check Exercise-4

Q1. Discuss Keynesian Model of inflation.

20.7 Bent Hansen's Model

Bent Hansen, in his A study in the Theory of Inflation, has carried the gap analysis of the demand-pull inflation still further. Keynesian gap analysis had been largely confined to the consideration of excess demand in the market for goods. Hansen brought about a disaggregation in his model of inflation. He considered the market for factors of production separately from the market for goods. In his view the excess demand for goods or "goods gap" should be measured separately from the "factor gap", that is, the excess demand for factors the "factor gap" is primarily related to labour.

According to B. Hansen, for a full Inflation to exist, there must be both, a goods and factor gap, each involving a positive excess demand. If there is a positive goods gap combined with a negative factor gap, the situation is considered less a situation of inflation, but is treated as a consequence of disequilibrium due to the overpricing of productive services.

The dynamics of Hansen's full-inflation case can be illustrated with the help of Fig. 20-4. The horizontal axis in this figure represents real income demanded and supplied and the vertical axis represents the ratio of price level to money wage rate (W-P/w) or the reciprocal of the real wage rate. The function D represents the behaviours of the aggregate demand. Its negative slope implies the assumptions that (i) total labour income changes directly with changes in real wage rates, and (ii) workers' marginal propensity to consumer is greater than that of the profit receivers. The S function is a hypothetical aggregate supply function in the sense of representing what the employers will be willing to produce with unlimited supplies of labour. It is positively sloped to show that there will be greater volume of employment as well as output as the real wage rate falls. It should be carefully noted to understand the diagram 'properly that, as we move upward along the vertical axis, the rate $\left(\frac{w}{P}\right)$ goes on falling as its reciprocal = $\left(\frac{w}{P} = W\right)$ goes on rising. The curve X is introduced as a constraint fixed by economy's full-employment capacity. Its shape suggests that workers respond to higher level of real wages by having more leisure as well as more goods.

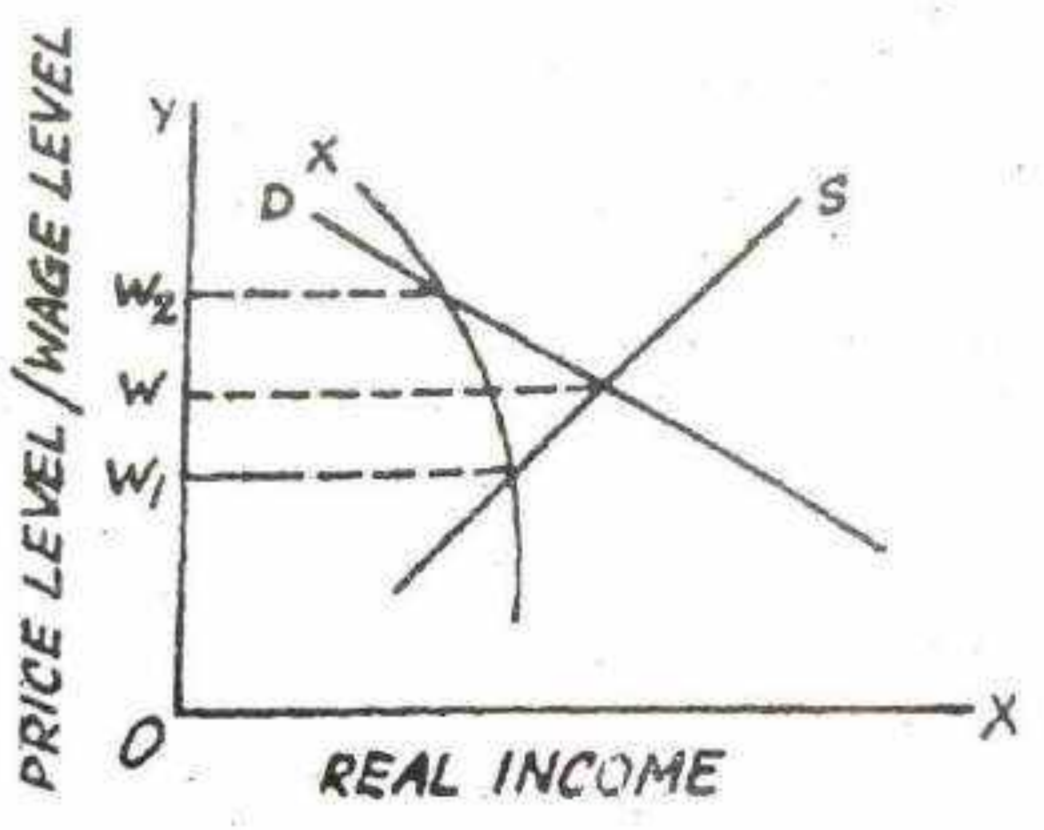


Fig. 20.4

The 'goods gap' is measured horizontally by the difference, (D-X), and the 'factor gap' is similarly measured by the difference, (S-X). In Fig. 20.4 above, both of them are positive between W_1 (a high level of real wager rate and W_2 (a low level of real wage rate). Just below W_1, the 'goods gap' is larger and the 'factor gap' is small. Just below W_2 it is the reverse, the 'factor gap' being large and the 'goods gap' being small. The assumed rates of both, the price inflation and wage inflation, are given by Samuelson's conditions:

$$\frac{dp}{dt} = f_p(D-X), \text{ and } \frac{dW}{dt} = f_w\,(S-X)$$

In plain language, it means that the rate of price- inflation depends on the extent of the 'goods gap', (D- X) and the rate of wage-inflation depends on the extent of 'factor gap' (S–X).

Now consider a position slightly above W,. Here the 'factor gap' is very small compared to the 'goods gap'. Consequently, money wage will rise slowly but goods prices will rise rather rapidly. This will result in lowering the real wage rate so that its reciprocal rises to the position W in Fig. 20-4. At a position slightly above W, the situation is reversed with 'goods gap' becoming very small and the 'factor gap' becoming relatively large so that money wage rises rather rapidly but the goods prices rise slowly. The real wage rate is thus increased. Meanwhile, both, the goods prices and money wages, continue to rise. But, the wages may fluctuate between $\frac{1}{W_1}$ and $\frac{1}{W_2}$ The inflation, open or suppressed, continues until the D-curve shifts to the left, or the X-curve shifts to the right. Neither of these movements will necessarily occur in time to avoid hyper-Inflation.

Hent Henson's analysis of demand-pull inflation is, no doubt, an elegant one. But in the words of Ackley, it is perhaps rather empty analysis of demand inflation". (cf. his Macro-economic Theory, Chapter XVI). It is basic assumption of his model, as embodied in the two equations referred to above, which is questioned. These two equations are :

(i) $\frac{dP}{dt} = f_p$ (D—X) and

(ii) $\frac{dW}{dt} = f_w$ (S—X).

These equations imply that there is some relationship (largely unspecified) between the above said gaps and the rate of price rise. According to Ackley, depending upon the specific nature of this relationship, the qualitative conclusion will be different under different hypotheses with regard to the exact nature of this relationship. For example, the conclusion will be different, if this relationship for the goods market is like B in Fig. 20.5 from the one that will be reached, if this relationship has been of the type A in Fig. 20.5.

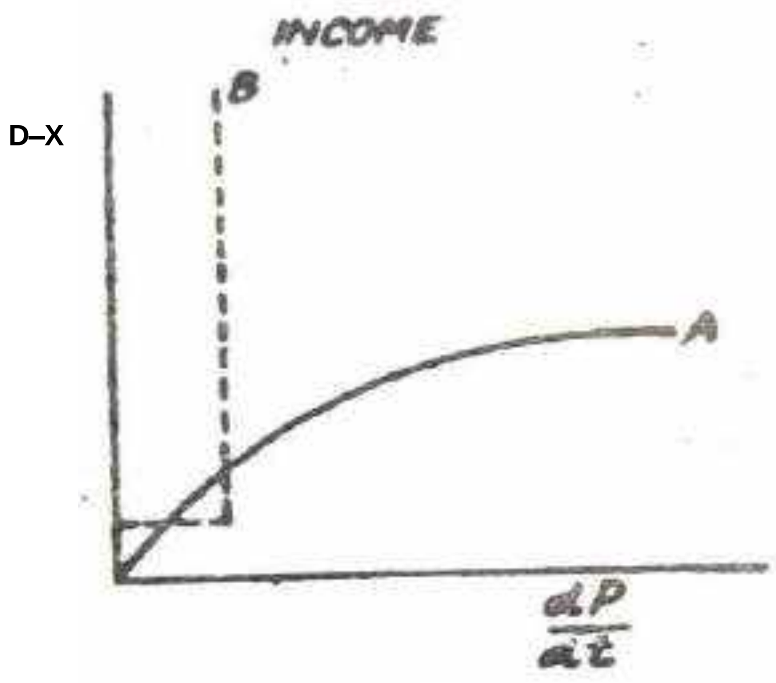


Fig. 20.5

In fact, Hansen's analysis can be said to contain a basic contradiction, namely, that the seeks to describe a situation of demand inflation free from such institutional elements as "wage policy", "administered pricing" or trade union pressures. But his assumption that there is a functional relationship between the sizes of the gaps and the time rate of inflation rests upon some kind of institutional behaviour in situations in which markets are not "cleared" by price variation. This institutional behaviour remains unexplored and finds no place in Hansen's analysis.

Self Check Exercise-5

Q1. Discuss Bent hansen's Model of inflation.

20.8 Summary

Inflation is a highly controversial term which has undergone modifications since. It was first defined by the neo-classical economists. They meant by it galloping rise in prices as a result of the excessive increase in the Quantity of Money. They regarded inflation as a destroying disease born out of lack of monetary control whose results undermined the rules of business, creating havoc in markets and financial ruin of even the prudent.

But Keynes did not believe like the neo-classical that there was always full employment in the economy which resulted in hyper inflation with increase in the Quantity of money. According to him, there being under employment in the economy, an increase in the money supply leads to increase in aggregate demand, output and employment. This process continues till the full employment is reached. The rise in the price level during this period's known as bottleneck inflation or semi-inflation. If the money supply increases beyond the full employment level, out-put increases to rise and prices rise in proportion with the money supply. This is true inflation, according to Keynes.

20.8 Glossary

There are several types of inflation observable in an economy. These can be classified as

(a) Creeping Inflation : When the price rise is very slow like the pace of a snail or creeper. It is called creeping inflation. It is the mildest type of inflation. The price level, rises approximately by 2% annually under creeping inflation.

(b) Walking or Potting Inflation : When the prices rise moderately and the annual inflation is a single digit it is called walking or trotting inflation.

(c) Running Inflation : When the prices rise rapidly like the running of a horse at a rate of speed 10 to 20 percent per annum. It is called running inflation.

(d) Galloping Inflation : When the prices rise very Fast at double or triple digit rater from more than 20 to 100% per annum or even more, It is called hyper inflation or galloping inflation.

20.9 Answers to Self Check Exercises

Self Check exercise -1

Ans.1. Refer to Section 20.3

Self Check exercise -2

Ans.1. Refer to Section 20.4

Self Check exercise -3

Ans.1. Refer to Section 20.5

Self Check exercise -4

Ans.1. Refer to Section 20.6

Self Check exercise -5

Ans.1. Refer to Section 20.7

20.10 SUGGESTED READINGS

1. G. Ackley, Macro-economic Theory Chapter XVI.
2. F.S. Brooman, Maero-economics Chapter XIII.
3. RJ. Ball and P. Doyle (eds), Inflation. Penguin Readings No. 4, 8, 13.
4. Bronfenbrenner and Holzman, "A Survey of Inflation Theory" in Survey of Economic Theory Vol II.
5. H.G. Johnson, Essays in Monetary Economics, Chapter III.
6. E. Shapiro, Macro-economic Analysis Chapter 22.
7. R. Dornbush and S. Fischer, Macro-economics. Chapter 13, 14.

20.11 Terminal Questions

1. What is meant by inflation? Explain the Demand-pull model of Inflation.
2. Explain Keynesian Theory of inflation. How does it differ from the classical theory of inflation?
3. Explain Bent Hanson's model of demand-pull inflation. How does it differ from Keynesian model?

*****

Unit-21

THEORY OF INFLATION (2)

Structure

21.1 Introduction

21.2 Learning Objectives

21.3 Cost Push Inflation

Self Check Exercise-1

21.4 Wage Push Inflation

Self Check Exercise-2

21.5 Mark-up Inflation

Self Check Exercise-3

21.6 Profit Push Inflation

Self Check Exercise-4

21.7 The Dilemma Model

Self Check Exercise-5

21.8 Summary

21.9 Glossary

21.10 Answers to Self Check Exercises

21.11 References/ Suggested Readings

21.12 Terminal Questions

21.1 Introduction

Inflation is a global phenomenon in present day times. There is hardly any country in the capitalist world today which is not afflicted by the specter of inflation. It is on account of this that the phenomenon of inflation has widely attracted the attention of the economists all the world over, but despite that there is no generally accepted definition of the term inflation as It is highly controversial term which has undergone modifications. Different economists have offered different definitions of inflation. Inflation in the popular mind is generally associated with rapidly rising prices which cause a decline in the purchasing power of money.

21.2 Learning Objectives

After going through this chapter you will be able:

- To understand cost push inflation

- To understand wage push inflation
- To understand mark up inflation
- To know the Dilemma Model

21.3 Cost-Push Inflation

We considered, in the last lesson, the nature and some models of the type of inflation that has come to be referred to as the 'demand-pull' inflation in the theory of the general price level. In the present lesson, we shall consider and explors the nature of the other very important type of inflation which is referred to as the "cost-push" inflation.

While the demand-pull inflation is believed to be caused by factors acting upon the aggregate demand, the cost-push inflation is persumed to be the work of forces working on the side of supply. You might recall that, while examining Bent Hanson's model of demand - pull inflation, we had referred to the neglect of certain institutional factors in this model. These institutional factors are no other than the existence of monopolies or Soligopolies, trade unions and other pressure groups in a modem economy. A basic weakness of almost all models of demand-pull inflation is their assumption of perfect competition which, not found in the real world economics. In real world economies which are characterised by various types or monopolies or semi- monopolies, the various pressure groups are able to hike there shares through their organized power this has the effect of shifting the aggregate supply curve upwards indicating a higher cost at each level of output (income).

The cost-push inflation theorists argue that, in economies characterised by the prevalence of monopolies, oligopolies, trade unions and other such pressure groups, the aggregate supply curve may move upwards as from S_u, to S_t to S, in Fig. 21.1 whatever may happen to the aggregate demands. In Fig. 21.1 D_0 D_1, D_2. represent the aggregate demand functions (as a function of the price level). Their negative slope has already been explained in the last lesson. Please go back to it, if you cannot recall it from memory. Y_0 represents the full employment level of real output or supply so that, at this level, all supply curves become vertical as shown in the figure. Suppose D_0 represents the initial aggregate demand conditions and S_0 represents the initial aggregate-supply conditions. The equilibrium price level is given by the point a so that it is P_0. Now let us suppose that due to a wage rise won by the workers' unions and/or price increase effected by the organised producers of some inputs, the costs rise so that the supply curve shifts upto the position S_1. If the demand conditions remain as they are, as shown by D_0, the new equilibrium price level will be given by the intersection of D_0, and the shifted supply curve S_1, which means that the new equilibrium price level. p_1, must be higher than before. This is not the end of the story. The point of intersection b between D_0 and S_1 shows that there would be unemployment and the real output would be less than full-employment output Y_0. Now, if the government is committed to maintain full employment. it will increase the government expenditure which will shift the aggregate function from D_0 to D_1. This pushes the price level still higher to $P_1 > P_1$. If there is a further rise in wages or prices of some other inputs so that the supply curve moves upto S_2. the equilibrium first moves to d which denotes some unemployment, and, at the same time, a rise is the price level. Commitment of the government to full employment will pull the demand curve to D_2, and thus the equilibrium moves upto e indicating a still higher price level P_2.

The above illustration given us a simple mechanism of the cost-push inflation. Incidentally, this also informs us that unemployment is the price that has to be paid in order to curb a rising price level.

Cost-push inflation has been the layman's instinctive explanation of a general and presistent rise in price level since the beginning of a monetary economy. As Bronfenbrenner and Holzman observe in their "A Survey of Inflation." "We know of no inflationary movement that has not been blamed by some people on 'profiteers', 'speculators', 'hoarders' or 'workers' and 'peasants' living beyond their stations." However, on the analytical level, 'Keynes gave some suggestions in his Treatise on Money wherein he made a distinction, between a "spontaneous' and an 'induced' increase in earnings, the former of which represented the cost-push inflation. Unfortunately, this insight was not further pursued by Keynes in his subsequent works.

The cost-push theories seem to be opposed to the demand-pull theories of inflation. But the fact is that they do not deny that the cost-push may involve increrases in money supply, money incomes and money expenditure, particularly, if decreases in output and employment are to be avoided. What basically distinguishes cost-push approaches to inflation from the demand-pull approaches is that, while the latter believes that the initial force starting the inflationary process comes in the form of increased aggregate expenditure in the community in response to increased aggregate monetary demand, the former believes that this initial force comes from the side of supply in the form of an upward shift in the supply curves caused by a 'spontaneous' rise in wages or profit margins (mark-ups) or prices of some inputs like raw materials or by a combination of two or more of these. The cost-push approach to inflation embodies the view that the strength of economic pressure groups together with increased public commitment to the goal of full-employment has increased the possibility, in a modern economy, of 'disequilibrium' price and wage increases being validated by expansive monetary and fiscal policies resulting from organised pressure on monetary and fiscal authorities. The combined effect of these changes is clearly towards a monotonic secular inflation, although the rate of such inflation need not be extreme.

Self Check Exercise-1

Q1. What is Cost Push Inflation.

21.4 Wage-push inflation

A particular types of cost-push inflation is the wage-push inflation. It is so called, because in this model the initial push comes in the form of a rise in wages, which raises the cost of production inducing the producers to cut back on their production and thus to reduce the supply of goods, and prices of final goods may rise as a direct consequence of the rise in wages extorted by the workers' unions and also as an input affect of the rise in the wage rates in industries producing inputs for the final goods industries. The rise in the prices of goods particularly, of goods entering the daily budgets of the workers make the workers' unions once again, act in order to get a rise in wage rates to protect their real wages. If they are successful, it, once again, starts the process of rising costs and prices. Thus, there may start a spiral in which rising wags push up costs and prices which, in turn, react on wages through trade union action so that there is further rise in wages, a further rise in costs and consequently a further rise in the prices of final goods, and so on. This spiralling process in which wages push up the prices and the prices push up the wages is described by economists as the 'wage- price spiral."

Let us now see under what circumstances a wage-push inflation can come about.

At the micro level such a 'push' can come about as a result of market forces only under non-competitive conditions. The demand for labour as a whole, or for a particular type of labour, must be less than perfectly elastic. Labour must be able as well as willing to shift its supply functions upward despite an unchanging demand. This suggests that there are certain conditions, on the side of demand as well as supply, which must be satisfied, if there is to be a wage-push inflation.

The Marshallian analysis of joint demand provides us with useful tools for analysing the factors on the side of demand for labour. The inelasticity of demand for labour which, as noted above, is a precondition for a wage-push to appear, depends on (i) the elasticity of substitution between labour and at her cooperant factors, (ii) the elasticity of demand for the final product, (iii) the ratio of wage costs to total cost and (iv) the elasticity of supply of the cooperant factors. The lower is value of the three elasticities mentioned above under (i), (ii) and (iv), the more inelastic the demand for labour would be. A low ratio mentioned above under (iii) also augments the inelasticity of demand for labour. Since the condition of a very low elasticity of substitution is not likely to be fulfilled in the case of a very large part of all workers, therefore there is not much of a chance for a wage-push inflation to appear in the economy as a whole by this route. In the absence of this condition, a substantial wage-push could come about only if workers were organised into a strong union which could effectively reduce the elasticity of substitution between union labour and non-union labour and other factors.

However, even the organised unions, not to speak of unorganised labour, will fail to raise wages in an enterprise, the demand for whose final product is more or less perfectly elastic, unless, of course, the entreprise possesses special advantages, which are a source of windfall profits to it. It is because, under competitive conditions a rise in wage costs in a particular firm alone will immediately reduce or eleminate its profits and thus drive it out of business.

The above, however, need not imply that wage- push inflation is unthinkable within an environment of competitive industries. For, it is possible that the union. bargaining on behalf of the workers, may proceed on a multi-union or multi-employer basis. As H.W. Singer has observed in his paper. "Wage Policy in Full Employment," (E.J. Dec. 1947), if unions act in unison or bargain with many employers simultaneously wages may be pushed up, because the firms in question face, in the aggregate, a less than perfectly elastic demand curve. This argument applies to oligopolistic industries as well. But it may be said, as demonstrated by Carter and The Ulman, that this line of reasoning is double-edged; for the employers, as a group, may as well resist the union demand for increase in wage and may collectively decide to face strikes rather than raise wages. However, whether they do or do not actually resist the higher-wage demands of the workers would depend on the additional variables, such as the level of business activity and expectations with regard to the changes in that level. Under relatively buoyant business conditions, firms will not generally resist such demands, as they will not like to have strikes. At such times, the short-period demand curve is less elastic and may even be expected to shift upwards profits are higher and the cost of strikes is greater than when the business activity is rather at low level and unemployment is at a high level, Multi-employer bargaining in such a situation of brisk business activity removes the last restraint on wage increase. However, in times of depressed business activity, the reverse is likely to be true.

In theory, the opportunities for obtaining wage increases in the absence of current increases in demand are greater in oligopolistic firms. The product demand curves facing oligopolists are less elastic than they are in competitive markets, giving the unions something "to climb up on" as well as making it possible to pass a part or most of a wage increase on to the consumers insofar as oligopolists practice 'mark up' or 'cost plus' pricing policies, as most of the empirical studies seem to show. it is not improbable that the whole increase in wages may be passed on to consumers in the form of higher prices, which, through the chain reaction described earlier, may actually cause a 'wage price' spiral of inflation. Large profit margins in some oligopolistic industries may encourage inflation by inducing workers to demand and force large wage increases. Statistical evidence in support of it has been provided by economists like Levinson, Bowen, Bhatia, Eckstein and Wilson.

We have so far examined some important factors on the side of demand which may account for a wage- push. Now we shall go over to the supply side to discover similar factors. Here the goals of trade unions as well as their control over the supply of labour are important. A major goal of all unions is to secure a rise in wages. There are three distinct sets of circumstances which can activate the unions for getting a rise in wages. They are (i) rise in the cost of living, (ii) rise in the productivity and profits, and (iii) rise in the neighbouring strategic wage rates.

It is sometimes suggested that there is less chance of a wage push inflation developing from the first two sets of circumstances enumerated above than from the third. It is argued that an increase in the cost of living is likely to be caused by a previous increase in aggregate demand so that the rise in wages in this circumstance, and its further repercussions on the general price level, will be tritely speaking, more of a demand-pull than a cost-push inflation. However, this need not always be true. A number of successive harvest failures or government support to food and other agricultural prices may also raise cost of living and thus push upward the supply curve of labour. In the second circumstance of higher profits and higher productivity increase in wages, it is said, may not cause a rise in prices at all. if it can be absorbed by the increased productivity. But the difficulty arises when the combined claims of the workers (in the form of higher real wages) and the firms (in the form of higher real profits) sum up to more than the increase in productivity, and neither of the two groups is willing to budge from its claims. This may cause a wage push as well as a profit push, if both the real wages as well as the real profits are sought to be increased through an increase in money wages and money profits. If profits are not sought to be increased, but the increase in wages by the unions is greater than the increase in productivity. there will be a clear-cut case of wage push. It is the third circumstance which, undoubtedly, gives rise to a wage- push inflation. The alternative hypotheses regarding wage structure, such as Dunlop's wage contour.' Ross's 'orbits or coercive comparisons', and Harbison's "wage constellations' suggest that different wage rates move around some key wage rates for the unions see to it that wage differentials are not heightened. The attempts to prevent wage differentials from increasing is likely to involve a 'wage-push' because push attempts are usually uncorrelated with excess demand, excess profits or large increases in productivity.

A mechanism, through which a wage-push inflation may develop from wage differentials, may be as follows: A high-productivity worker may be hired at a high wage within a certain job category : a high-productivity firm within an industry may grant a large wage increase; high profit oligopolistic firms may grant wage increases: the demand for products of some firms or industries may rise and for others may fall, in of which prices and wages rise but only in the former type of firms or industries. Thus wage differentials between different types of workers between different firms or industries increase. Elimination of these differentials becomes an immediate goal of the unions. To the extent that unions succeed in removing them, and, in doing so, secure wage increases which are greater than what can be justified in terms of productivity or demand for labour, prices will have been pushed up.

The operation of the above mechanism depends largely, as Kuhn has suggested in his Market Structures and Wage-Push Inflation, on short-term labour on immobility regardless or wage differentials. If mobility is present, a rise in productivity or demand in a firm or industry, which raises wages in that firm or industry, would attract labourers from other firms or industries. This reaction will tend to equalise wages, though at a level slightly above the old one, but not so high as would prevail, if mobility had been absent. It is thus, differential rates plus immobility of labour which leads to the 'greater than competitive wage-push. We have seen that in this mechanism, a raise in wages in one firm or industry generates a chain reaction on wages in other firms and industries so that there is a general rise in wages. Thus, this mechanism in referred to as "wage- wage' spiral, which ultimately pushes up the costs and prices.

The ability of unions to push up wages depends on their degree of control over the supply of labour which, in turn, depends on the extend and strength of the trade union organisation.

Self Check Exercise-2

Q1. What is Wage Push inflation.

21.5 'Mark-up' Inflation:

G. Ackley has presented a model of cost-push inflation in which costs and prices are pushed by the practice of setting prices according to the 'mark-up' principle. A similar model has been presented by Weintraub also in his Report, Growth Without Inflation, prepared by him for National Council of Applied Economic Research of India.

Mark-up pricing tends to facilitate the inflationary consequences of a cost-push. The mark-up pricing tends to contribute to a cost-push inflation due to the following reasons: (i) the price rise follows directly and. therefore more rapidly upon a wage increase or an increase in the costs of some raw materials. (ii) Since under monopolistic and oligopolistic conditions where as the empirical studies tell us. prices are set according to the mark-up or the cost plus principle, prices are insensitive to demand, therefore any rise in wages or prices of raw materials induces a rise in prices for profit margins to be maintained: therefore, in the event of a cost-push coming up either in the form of a wage rise or a rise in the prices of some raw materials. the final- product prices are apt to be set at a higher level than what is warranted under the conventional short run profit-maximisation principle, (ii) The foregoing argument implies that management of an enterprise will not care much to resist wage increases, when mark-up princing is practised.

In his model of the make-up inflation. Ackley assumes that all firms base their prices on some mark-up over the costs of labour and materials, and that labour seeks and increase in money wages that involves a mark-up over the cost of living. The result is a ratchet 44 effect on prices, which we described earlier as wage-trice spiral on the assumption that the initial push comes from the side of wages. Ackley father points out that much of this process develops in inter-flam transactions as each firm is induced to mark-up price as a result of the mark-ups included in the prices of intermediate products it purchases from other firms.

Thus, if all wages and prices are set by mark-ups an inflation could not be initiated in the short run by excess demand, nor be stopped by deficient demand. However, over a longer run: the picture might be different, when the excess demand may induce firms to revise upwards their mark-ups, which may bring on acceleration in inflation without a change in costs.

It is interesting to note that the logic of mark-up pricing implies that a purely demand-pull inflation tends to be curbed by the mark-up pricing during short period.

Self Check Exercise-3

Q1. What is Mark-up inflation.

21.6 Profit-push Inflation:

When the initial upward push to the price level is given by an increase in profit margins or mark-ups, the ensuing inflationary process is described as 'profit-push inflation' which is only a particular type of cost-push inflation (Try to spell out the process of profit-push inflation following the analogy of the wage-push inflation). The system of administered prices always has the potential of a profit-push inflation, for, by raising mark-ups, the firms may increase prices even when no increase in costs or demand takes place. However, it is often argued that a profit-push is likely to be smaller than a wage-push, because (i) profits make up a smaller part of price than wages, and (ii) a profit-push is more likely to be a 'once and for all' push, while wage pushes are more likely to be continuous. The latter proposition is generally based upon the following considerations: (i) Profits of a firm depend not only on high prices but also on the volume of sales and the level of unit costs and sales and unit costs' depend, in part at least, on the prices charged. This consideration may keep a profit-push under check. (ii) There is much less likelihood of a profit-profit competitive spiral than of a wage-wage spiral, Moreover, even if there is some competition among firms to increase, their profit margins it is more likely to be conducted on some non-price basis than on the price basis. Thus, for example, it may assume the form of competition to increase productivity and/or sales through advertisement etc. (iii) The positive expenditure wit effects of higher profits are likely to be much less than those of wage increase.

The above arguments against the possibility of an acute and continuous inflation developing from a profit-push are not by any means, conclusive. The first argument is not very strong in view of the assumed inelastic demand curves in oligopolistic markets and. insensitivity of mark-up prices to demand conditions. Though it seems plausible that there is much less chance of a profit-profit spiral, yet, if the profit, competition takes the form of competitive advertisement, it is not clear how it can prevent prices from rising, especially under mark-up pricing system for, advertisement after all, is only an input involving an addition to costs over which mark-ups are based. It is also true that the primary expenditure effects of increase in profits are not as large as those of wage incfenses, but when we take account of secondary dies and recognise that a profit-push to prices will result in an increase in cost of living which, along-with the high and increased profits, is sure to provoke unions to strike for higher wages, we cannot but concede that a profit-push may start a profit- price spiral no less serious than a wage price spiral.

Self Check Exercise-4

Q1. What is Profit-push inflation.

21.7 The Dilemma Model:

It was explained in the beginning of this lesson that, whenever due to a cost-push the aggregate supply curve shifts up, as it does in Fig. 21.1 while the aggregate demand conditions remain the same so that there is no shift in the demand function, there is not only a rise in the price level but also a fall in employment, This is evident from Fig. 21.1 that If an effort is made to maintain full employment through measures, fiscal and monetary, to increase the aggregate expenditure of the economy, it adds the demand pull to the cost-push, which would further shift up the supply curve, resulting in further rise in price level as well as a reversion to less than-fill-employment position. Now, this definitely puts the economic and political authorities in a true dilemma, for the cost of maintaining full employment is an ever rising price level. While the cost of maintaining a stable price level is a certain degree of unemployment. Which alternative of the two to choose is the dilemma we are in is high-lights the impossibility of achieving simultaneously and without price or wage controls, the win objectives of full employment and price stability?

While Keynes and Joan Robinson had forseen, this dilemma in the pre-war period, this model was developed by Reder, in this paper. "The Theoretical Problems of a National Wage Price Policy" (1948), and by Bowen, in his paper. "The Wage-Price Issue" (1960). The records of many nations with, strong producer pressure groups show that, as unemployment is reduced below a certain critical level. prices begin to rise; and that when prices are stable, unemployment is above the level that is considered "socially tolerable". The so called Phillips Curve is based on such data concerning U.K. and it does in a way throw up the essentials of the dilemma referred to above.

A.W. Phillips in his "The Relation Between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom. 1862-1957: presented a new approach to the problem of inflation and anti-inflationary policy. His approach by passed the argument over the cause of inflation, and. instead concentrated on the dynamics of the market for labour The Keynesian analysis on the policy problem of inflation had long included the general notion that the rate of wage increase is in part at least a function of the rate of unemployment such that wages (and therefore. prices) tend to rise faster, the lower is the rate of unemployment. Phillips's "contribution was to develop an empirical relationship, apparently stable over a long period of British economic history, incorporating the idea of a functional relationship between the rate of money wage increase and the percentage of unemployment". It is this empirical functional relationship between the rate of increase in unemployment and the rate of change of money wage rates that has come to be known as the "Phillips Curve".

The Phillips Curve, as already noted, relates changes in the rate of unemployment to the rate of change in money wage rates. But, since prices may safely be assumed to be positively and quite strongly correlated with money wage rates, it can be easily converted into a curve relating the rate of price change to the rate of unemployment, which will look like the curve in Fig. 21.2. As we move from B, which is a point of a high rate (percentage of unemployment, to the left, unemployment rate falls, but the rate of price increase goes on increasing. Moving from O towards B and beyond, we find the percentage of unemployment increasing, though the rate of increase of prices is falling such that, beyond B. prices stop rising and, instead, start falling. To many policy makers it obviously presents a dilemma full employment or a stable price level?

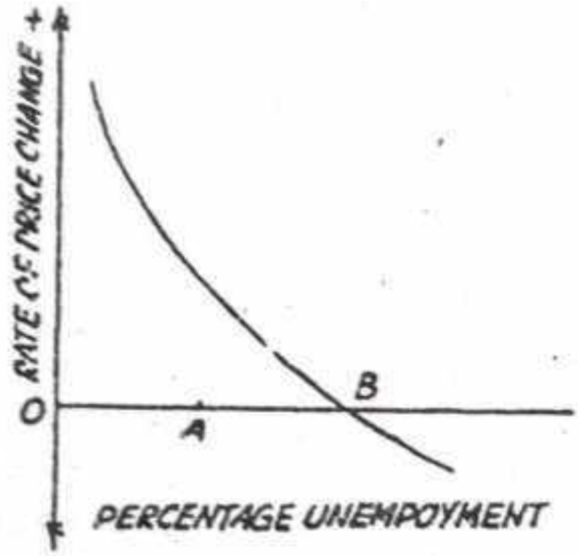


Fig. 21.2

Price may begin to rise before full employment for serveral reasons involving no exercise of market power by any economic group. A.H. Hansen points out, in his "Cos: Functions and full Employment" (AER, Sep. 1947), that, as capacity is reached, the marginal as well as average cost may increase because of diseconomies of scale. A number of analyses, involving low elasticity of substitution between factors, suggest that non-labour-factors may be over-employed, while unemployment of labour still exists (cf. A. Smithies. The Conrol of Inflation' RE and S Aug. 1957). Any attempt to reduce un-employment of labour by increasing aggregate expenditure in the economy would raise the prices of non-labour factors which cause a persistent rise in the price level. Moreover, attempts to reduce frictional and structural unemployment of labour below some reasonable: limit may lead to rising wages and prices before the number of unfilled vacancies exceeds the number of the unemployed.

Whatever be the extent to which unemployment can be reduced most rapidly or permanently by increasing aggregate expenditure, it can be done only at the risk of rising costs and prices. Hence, the authorities are faced with a dilemma between the desirable alternatives of stable prices and high employment.

There are, at present, two economic views regarding the gravity of this dilemma, A.G. Hart had estimated that upwards of 10 percent unemployment was required to stabilise prices. Phillips' estimate was 7 to 8 per cent which too is quite high. The monetarist view, as represented by Morton and Friedman, is that there is almost no dilemma. They feel that a small amount of unemployment, and no state guarantee of full employment, would rapidly end the wage-push, and that inflation occurs only because the fiscal authorities insist" on validating all wage increases, thereby encouraging abnormal wage demands.

The existence of the dilemma and its inflationary close-to-full-employment solution by most nations led Reder and Hicks to point to the fundamental changes that have taken place in the macro-adjustment mechanism and which are not taken note of by the monetarists like

Friedman who denies the existence of any dilemma at all. Reder points out that Keynesian theory assumes the existence of a "unified monetary authority" which can affect the global magnitudes such as the price and employment levels. Morton and Friedman go a step further in any such authority, on behalf of the state, of its commitment to full employment or a high level of employment. The fact is that in a modern advanced economy, the monetary authority is only a part of a trilateral monopoly, its other two adjuncts being the monopoly power enjoyed by labour unions. On the one hand and by the big business on the other. All these three monopolies-the monetary authority the labour unions and the employer' associations can exert independent power in the macro-market place. Like other monopolies, the monetary authority can control either the price level or employment level but not both at the same time, Hicks. following the same like of thought, argues that nations are no longer on a gold standard but rather on a "labour standard". In the old days if wages were too high unemployment ensued and wages yielded. Today there is no such thing as a disequilibrium wage, because the monetary system accommodates to disequilibrium in the labour market.

The upshot of this discussion of the dilemma model so far is that in a modern welfare state committed to the objective of maintaining a high level of employment, if not to full employment, one must learn to live with rising prices. This is the price we have to pay to realise the objective of a fairly high level of employment.

Self Check Exercise-5

Q1. Discuss the Dilemma Model.

21.8 Summary

There is a great Controversy among economists as to whether inflation promotes economic development. There is a group of economists, including Keynes which is of the view that inflation promotes the economic development of the country.

(1) The first argument adduced by these economists is that inflation redistributes income and wealth in favour of the entrepreneurial classes who have a high propensity to save or low propensity to consume.

(2) Inflation invariably creates optimistic condition in the economy and affords fresh opportunities for businessmen and the entrepreneurs in new productive enterprise.

(3) There is no doubt that there will be some inflationary rise in prices at least in the initial stages consequent upon deficit financing in a developing economy. Inflation becomes some what inevitable in the process of economic growth. In fact, economic growth and inflation generally go together. Inflation leads to economic growth and economic growth, in its turn results in inflation.

21.9 Glossary

Inflation may be considered to be unjust on the following grounds :

(1) It increases economic inequalities through its redistributive effects. By transferring purchasing power from the poorer to the richer sections, inflation widens the gulf between the richer and the poorer classes.

(2) Inflation is also regressive in character. By raising the prices of essential goods, it imposes a heavier burden on the poor sections of the community.

(3) Inflation also results in an invisible taxation of the people.

(4) Inflation gives rise to a sort of artificial prosperity in the country. Inflation feeds inflation. The price level goes on rising and after sometime it reaches its highest limit.

(5) Inflation is also highly demoralizing in character. It gives rise to a spirit of gambling among the people.

21.10 Answer to Self Check Exercises

Self Check exercise -1

Ans.1. Refer to Section 21.3

Self Check exercise -2

Ans.1. Refer to Section 21.4

Self Check exercise -3

Ans.1. Refer to Section 21.5

Self Check exercise -4

Ans.1. Refer to Section 21.6

Self Check exercise -5

Ans.1. Refer to Section 21.7

21.11 References/ SUGGESTED READINGS

1. G. Ackley, Macroeconomic Theory Ch. XVI.
2. H. G. Johnson, Essays in Monetary Economics Ch. III
3. E. Shapiro, Macroeconomic Analysis. Ch. 22
4. D.E.W. Laidler, "Inflation: A survey". Economic Journal sec. 1975
5. R. Dornbush and S. Fischer, Macroecoomics Ch. 13 and 14

21.12 Terminal QUESTIONS

1. What is cost-push inflation? How does if differ from demand-pull inflation?
2. Explain the basic model of cost-push inflation.

*****

Unit - 22

PHILLIPS CURVE

Structure

22.1 INTRODUCTION

We had referred to Phillips curve in the last Unit in connection with the Dilemma Model of inflation. The Phillips Curve hypothesis held a great sway on the minds of economic theorists as well as policy makers for over a decade after its publication in 1958. Its author, Prof A.W. Phillips of the London School of Economics and Political Science, published in 1958 his famous study of the relationship between the changes in the rate of unemployment and the rates of change in the money wage rates in the British economy over a longish period extending from 1862 to 1957 under the title, The Relation Between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1862-1957", utiliing annual data for Great Britain from 1861 to 1913. Phillips, in this study, suggested that there was an apparent stable relationship between changes in the unmployment rate and the rates of change in money wage rates. The stability of this functional relationship between the two variables, the unemployment rate and the rate of change in money wage rates, was inferred from the findings that except for minor exceptions, the relationship which fitted for the data form 1861-1913 also fitted for the data for the periods 1913-48 and 1948-57. This apparently stable relationship was discovered in this study to be an inverse relationship, that is, lower levels of unemployment rate were associated with higher rates, of change in money wage rates as shown by a hypothetical Phillips curve of our Fig. 221 below. It clearly points to the hypothesis that a decrease in the rate of unemployment is accompanied by or results in a rise in the rate of change in the money waye rates, and, conversely rise in the rate of unemployment results in a fall in the rate of change in the money wage rates.

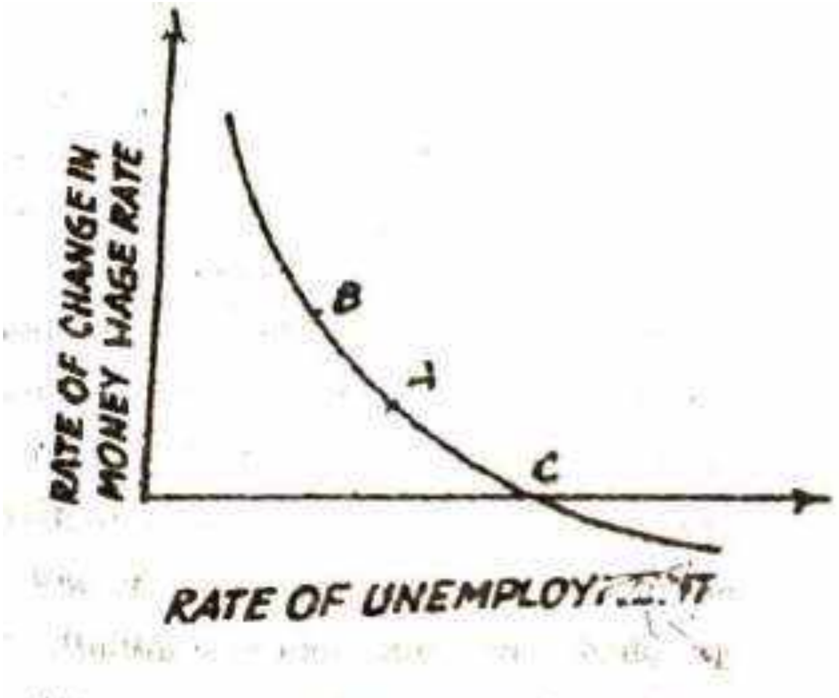


Fig. 22.1

The Phillips carve shown in Fig. 22.1 is a negatively sloping curve (declining downwards to the right) showing the above said inverse relationship between the rate of unemployment and the rate of change in the money wage rate. Moreover, the Phillips curve has another attribute too. It is that it is non-linear re and convex to the origin indicating that its slope goes on falling as we move along this curve downwards. The implication of this attribute is that a given percent fall in unemployment from a high level like that indicated by the point C is accompanied by a smaller change in the rate of change in the money wage rate than that which the same percent fall in unemployment from a lower level like that indicated by points like A or B would be accompanied by. It is because as we move upwards along this curve, unemployment is falling and its slope.

$$\left(whicheuqals \frac{Rateof\ changeinmoney\ wagerate}{Rateof\ unemployment} \right)$$

is rising. Thirdly, the point at which the Phillips curve the intersects the horizontal axis indicates zero rate of change in the money wage rate which is defined as the stable money wage rate. If the rate of unemployment exceeds this rate, that is, if it moves to the right of point. Cin Fig. 22.1, the rate of change in the money wage rate will become negative as the

Phillips curve will then fall below the horizontal axis. But, this brings us to another below the horizontal axis. But, this brings us to another attribute of the Phillips curve, below the horizontal axis the Phillips curve. becomes flatter and flatter indicating that there is some minimum money wage rate below which it cannot fall which lends support to the Keynesian hypothesis that even under an extreme level of unemployment, as would be the case during a period of deep economic depression, the money wage rate will refese to fall further below a certain minimum level. This hypothesis of Keynes lies behind his labour supply function which is assumed to be horizontal at such a critically minimum wage rate.

The above Phillips curve is sometimes referred to as the simple Phillips curve or the short-period Phillips curve, specially in the monetarist comments on it.

22.2 Learning Objectives

After going through this chapter you will be able to :

- understand the Philips Curve
- know the Implications of Philips Curve
- know that the Philips Curve is a Menu for Policy Choices
- understand the Long run Philips Curve

22.3 Implications of the Phillips Curve

Apart from some of the implications of the Phillips curve that we have already hinted at in the preceding section, it provides us with a model of wage inflation which can be suitably amended to yield a model of price inflation too. Its implication with regard to wage inflation is quite obvious. The hypothesis embodied in it implies that reduction in unemployment causes and increase in the rate of increase in money wage rate. Therefore any policy, monetary or fiscal, which aims at reducing unemployment below a certain minimum level such as that indicated by point C in our Fig. 22.1 above would not have raise the money wage rate but also the rate at which money wage rate would be rising.

How, we assume that the productivity remains manifested by a change in the rate of unemployment, the relationship between the rate of change in money wage rate and the change in the rate of unemployment: depicted in the Phillips curve implies that the rate of change of money prices will also be inversely related with the change in the rate of unemployment. If we plot the rate of change of the money price level instead of the money wage rate along the vertical axis, while the rate of unemployment is measured along the horizontal axis, we shall get a curve similar to the Phillips curve of Fig. 22.1 above having the same properties as shown in Fig. 22.2. below.

Since the rate of increase of the general price level is technically known as the rate of inflation, the modified Phillips curve of Fig. 22.2, unilke the original Philips curve, related the rate of price rise or the rate of inflation with the falling level of unemployment and by the faction with the rising level of unemployment in nutshell the Phillips curve implies that the lower is the level of unemployment, the higher is the rate of inflation or the higher is the level of employment the higher is the rate of inflation. Conversely, the higher is the level of unemployment and, therefore, the lower is the level of employment, the lower will be the rate of inflation.

In a sense the Phillips curve is indeed a model of the demand-pull inflatior. As employment increases and unemployment falls, the aggregate effective demand increases and thus exerts its pressure on both the money wage rates and goods prices. The prices of goods may rise directly as well as indirectly, Directly because the supply of goods may not increase immediately and, moreover, even over a short period when increasing amounts of labour can be combined with the existing productive capacity, there might be diminishing returns causing costs rise which, in turn, would raise the prices of goods.

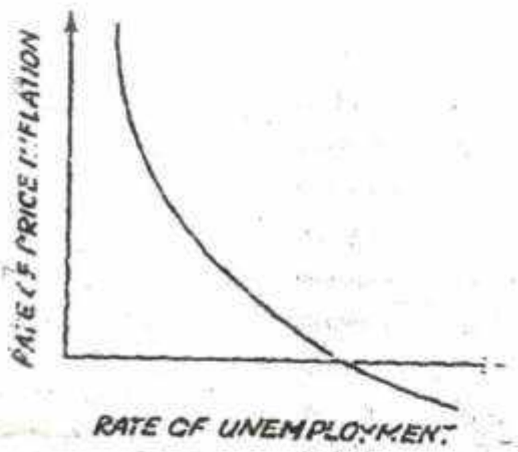


Fig. 22.2

In simple Keynesian models of demand-pull inflation (represented by the so called gap analysis), inflation is generally shown to take place when there develops a positive gap between the aggregate effective demand of expenditure at the full-employment level of real income as shown in the following Fig. 22.3.

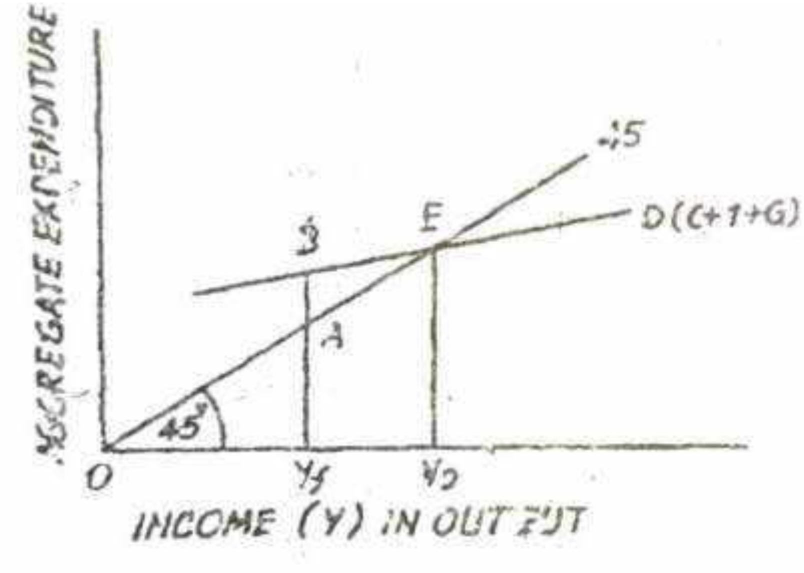


Fig. 22.3

In Fig 22.3 Y_t is full-employment income. D(C+I+G) is the aggregate demand or aggrgate expenditure function which determines the equilibriem level of income in conjunction with the 45° line, fulfilling the equilibrium condition that aggregate demand equal the aggregate supply or, alternatively, aggregate expenditure equal aggregate income. This condition is satisfied at giving the equilibrium level of income Y_t. But, at the full-employment level of income Y_f, agregate expenditure Y_f B is greater than the income $Y_f A = OY_f$ by AB which is the positive inflationary gap. The bigger is gap, the greater is the pressure of aggregate demand on the prices to be pulled up as output cannot exceed the full-employment output Y_f More precisely, the rate of inflation will be determined by the ratio $\frac{AB}{AY_f}$ or, alternatively, by the ratio $\frac{Y_f Y_0}{OY_0}$. However, the important point to note here is that in such simple models inflation starts only after full employment. It is because in these models the supply of labour as well as its complementary inpouts is assumed................elastic and even diminishing returns assumed away so that the supply of output is also assumed to be perfectly elastic.

But the real-world economies do not reveal suchos perfectly elastic supplies, if for no other reasons, at least because diminishing returns would make supply curves upward sloping. In fact, there had been a Keynesian perception that money wage rates raight rise before full employment and, consequently, prices might also start rising before full employment (the so-called bottle-neck o inflation of Keynes). Prices may begin to rise before full employment for several reasons involving no exercise of marker power by any economic pressure group. A.H. Hansea, for example, had observed in his "Cost Functions and Full Employment" (cf. American Economic Review, Sept. 1947) that as capacity output was reached, the marginal as well as the average costs might increase because of diseconomies of scale. Similarly, some other analyses like A. Smithies's The Control of Inflation" (cf. Review of Economics and Statistics, Aug. 1957), referred to low elasticities of substitution between factors suggesting that non-labour factors might be over-employed while unemployment of labour still existed. In such under-full employment situations any attempt to reduce unemployment of lacour by increasing aggregate expenditure in the economy would raise the prices of non-labour factors which cause a persistent rise in the price level. Moreover attempts reduce fractional and structural unemployment below some reasonable limit many to rinaing money wage rates and prices before employment.

The above theoretical reasonings seem to provide a theoretical support to the Phillips curve or hypothesis which is an empirical hypothesis. On the hand, the Phillips curve may be thought to have provided an empirical ballast to the Keynesian gap anaylsis.

However, the greatest significance of Phillips curve lies in its bringing out into the open the dilemma which the policy-makers have to face and of which, a explained above, Keynesians were ever quite aware not too vaguely. Thus we can state that the most important implication of Phillips curve is that inflation and in of unemployment can cosxist and that they are not antithetical or polar cases as misleadingly suggested in simple abstract acynesian models like the one depicted .... and, moreover, it suggests in strongly that a permanent decrease in unemployment can be purchased only at the cost of a permanent increase in the rate of inflation. Thus the dilemma brought into the open by the Phillips curve for the policy makers was what to choose: a high level of employment (or a low level of unemployment) with a high rate a Inflation or a low rate of inflation with a high leavel of unemployment Cow level or employment).

Self Check Exercise-1

Q1. What do you know about Philips curve discuss its implications.

22.4 Phillips Curve: A Menu for Policy Choices

There is no doubt that the Phillips curve points towards a dilemma for the policy makers inches seneschal they can opt for either a stable price level or full employment. Both at the same time would be as impossible target. However, a careful examination of the Phillips curve also, in fact, suggests a constraint in the sense that to have a little more of one thing implied having, less of the other thing. If we go in for greater employment and therefore less unemployment, then we must accept less price stability and higher rate of inflation. Thus the Phillips curve implies a trade-off relation between unemployment and rate of inflation: An attempt to reduce the unemployment rate by a given percentage point has to be paid for by accepting certain rise in the rate of inflation. The choices open to the policy makers are not just the two extreme ends: full employment and a very high rate of inflation on the one end, and stable price level with a very high rate of unemployment on the other. This is the type of situation unrealistically imagined in the Dilemma Model, or inflation.

There are, in fact, quite a number of other choices also which are indicated by all the points lying on the continuous Phillips curve. Each point on it indicates a given combination of rate of unemployment (employment also by implication) and the rate of inflation. All those points or combinations thus represent alternative choices for the policy makers, that is, a sort of menu for policy out of which the policy makers can choose only a particular combination at a time. Since the Pop curve also suggests a trade-off relation between rate of unemployment and the rate of inflation, it implied the esponsible policy makers must weigh the benefits flowing from a given reduction in the unemployment rate against the risks involved in the accompanying rise in the rate of inflation.

Thus Phillips curve can be regarded as a menu for policy choice implying that for a given structure of the labour market and for given 'external' factors such as the rate of change of import prices, the policy makers could only make a choice only out of the combinations of the unemployment rate and the inflation rate lying on this curve. Aiming at a zero rate of inflation of a zero or a near-zero rate of unemployment would be an impossible, if not an utterly foolish, enterprise.

However, we should note that from the point of view of policy making, the slope as well as the position of the Phillips curve is important. A steeper Phillips curve would indicate a higher rate of inflation consequent upon a given decrease in the unemployment rate from a given level then on a flatter Phillips curve. Conversely, along a flatter Phillips curve a larger decrease in unemployment can be brought about at the cost of a given increase in the rate of inflation than it can be done along a steeper Phillips curve.

On the other hand, if any two Phillips curves have equal slopes, the one nearer to the origin is to be preferred to the one which is farther away from the origin. It is because for any given rate of inflation the former represents a lower rate of unemployment than the latter.

Lastly, consider that the society has a preference scale which gives the policy makers feasible menu of choices. Let us suppose that the society is not prepared to accept a rate of inflation which is higher than that depicted by OA in Fig. 22.4 below, and it is also not prepared to accept a rate of unemployment which is higher than OB in Fig. 22.4. In that case, the feasible menu for policy choices will be indicated by the area bounded by the rectangle OBCA in Fig. 22.4. if the Phillips curve has a position like that of P which passes through this area, then all the combinations lying on that portion of it which lieser this rectangle will be the feasible combinations any one of the which will be socially acceptable. On the other hand, if the Phillips curve has a position like that of P, in Fig. 22.4 above so that it neither passes through nor touches the rectangle OBCA, then there would be indeed a dilemma for the policy makers, there being only two choices open new: either L or M either of which satisfies only one of the two constraints. If L is chosen, the rate of unemployment associated with it (OB) it would be greater than the socially acceptable rate OA. On the other hand, if M is chosen, then the rate of inflation associated with it (OA) is socially acceptable, but the rate of unemployment associated with it will be greater than the socially acceptable rate OB. Any other choice involves rate of unemployment and inflation which are not socially acceptable. Hence there is a dilemma whether to choose L or M.

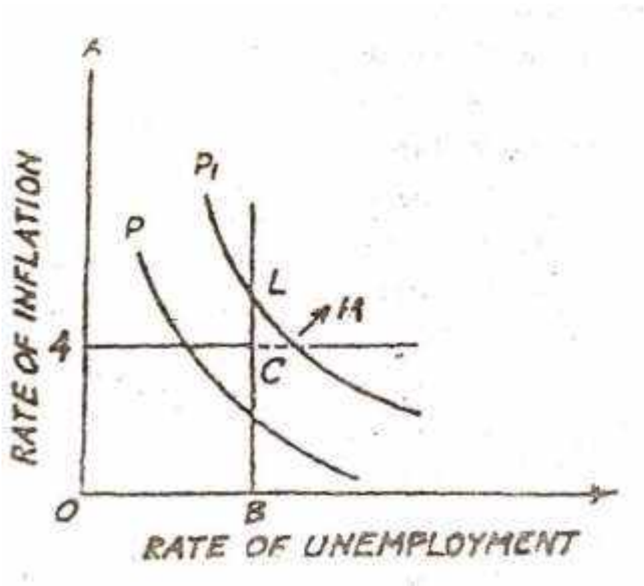


Fig. 22.4

Self Check Exercise-2

Q1. Why Philips Curve is regarded as a menu for policy choices?.

22.5 The Long-run Phillips Curve

The Phillips curve that we discussed so far has been described by the monetarists as the short-run Phillips curve and they have challenged the claim that it is stable over time. It was indeed based upon the Keynesian perceptions and rather on a long-term data of the British economy extended over a period of nearly a hundred years which, in no way, is a short period. Moreover, Phillips study showed that the relationship enraptured in the Phillips curve fitted the data for the three contingent shorter periods within the longer-run period of 1862-1957, as this relationship between the rate of unemployment and the rate of money, wage inflation was found to be valid for the data related to the periods 1862-1913, 1913-1948 and 1948-1957. But beginning with the late sixties, the Phillips curve came under increasing doubt. In the first place, most of the advanced economies as well as some developing economies went through an economic situation during the late sixties and early seventies in which rising rates of unemployment were accompanied by rising rates of inflation too. This phenomenon referred to as "stag flation" obviously contradicted the Phillips curve. This led to the increasing doubt being cast on the notion that the Phillips curve represented a stable permanent relationship between the rate of unemployment and the rate of change of money wage rates (and, therefore, by implication, the rate of inflation). This doubt was further strengthened as the monetarists claimed that the Phillips curve did not fit the data related to the American economy. So, the monetarist critics of the Phillips suggested that the U.S. data indicated that Phillips curve was not permanently stable and was subject to periodic shifts move over, they claimed that the direction of these shits was such that it indicated a worsening trade-off relationship: that is, every shift indicated higher inflation rate consistent with a given unemployment rate or conversely, higher unemployment rate colisistent with a given rate of inflation.

Various shift parameters causing these shifts in short-run Philips curve were considered. Among these the most important was the so-called expected or anticipated rate of inflation introduced by Milton Friedman. The monetarists perception that the Phillips curve is not stable but is subject to shifts has led to a distinction being make between the short-run and the long-run Phillips curve. This distinction has also led to a controversy whether a trade-off between rates of unemployment and inflation does exist or not.

The long-run Phillips curve is based on the neo-Fisherian prceptions belonging to the monetarist school of economic thought. The basic hypothesis implied in the long-run Phillips curve is that to the extent that workers are able to correctly forecast inflation and can adjust their wages according to such forecasts, there will exist no trade-off in the long-run between unemployment and inflation. The hypothesis was suggested powerfully first by Milton Friedman in his Presidential Address to the American Economic Association in 1967.

Friedman denied that Phillips curve was anything other than a purely transitory phenomenon. According to him, Phillips's error was that he confused money wage rate with the real wage rate. He measured along the vertical axis the rate of change in money wage rate instead of measuring the rate of change in money wage rate minus the anticipated rate of change in prices.

In the exposition of his hypothesis he introduced the concept of the natural rate of unemployment which is the key to the understanding of his argument. It is agreed upon by both the contending schools of thought, namely, the Keynesians and the monetarists, that full employment does necessarily imply not zero unemployment. On the contrary, both agree that full employment is consistent with some voluntary unemployment apart from the structural and frictional unemployment which might be caused by the structural rigidities of the labour market, on the one hand, and by workers changing jobs and registering themselves as unemployed while looking for another job. The existence of such unemployment that is consistent with full employment implies that measured unemployment will never be zero. It is in this context that Friedman proposed the concept of the natural rate of unemployment. Most briefly, it is that rate of unemployment which is consistent with the equilibrium in the free labour market, that is, with the real wage rate at which the demand for labour equals the supply of labour so that all those who are willing to work at this wage rate are employed. If we define this wage rate as the full-employment wage rate W_f, the natural rate of unemployment will be that proportion of the total labour force which would remain unemployed even at this full-employment equilibrium wage rate, W_r. Or. alternatively, we can define it as that proportion of the total labour force which would remain unemployed such in a situation of full-employment equilibrium due to structural rigidities of the labour market and/ or the frictional unemployment and/or voluntary unemployment.

The concept of the natural rate unemployment is, in fact, related to price expectations. Supposing the productivity remains standstill, then the prices will rise in the same proportion as the money wage rates. Further, suppose that money wage rates and prices are expected to be stable into the indefinite furture. In such a situation the actual and the expected rates of wage and price inflation would be zero. Now, if Phillips curve is assumed to be a true representation of reality, the unemployment rate, at which the actual and the expected rates of wage and price inflation would be zero and therefore the condition of wage-and price stability would be satisfied (at the point where the Phillips curve crosses the horizontal axis), is the natural unemployment rate. The rate of unemployment indicated by this point of intersection between the Phillips curve and the horizontal axis is, according to Friedman, the natural rate of unemployment because it is the only rate-at which the actual and the expected rates of inflation are the same. Thus, more technically, yet still briefly, Friedman's natural rate of unemployment can be defined as that rate of unemployment at which the actual and the expected rates of inflation are the same.

With the help of the above explained concept of the natural rate of unemployment, Friedman demonstrated that there could not exist a trade-off between unemployment and inflation in the long run. This can be explained with the help of the diagram of the following Fig. 22.5.

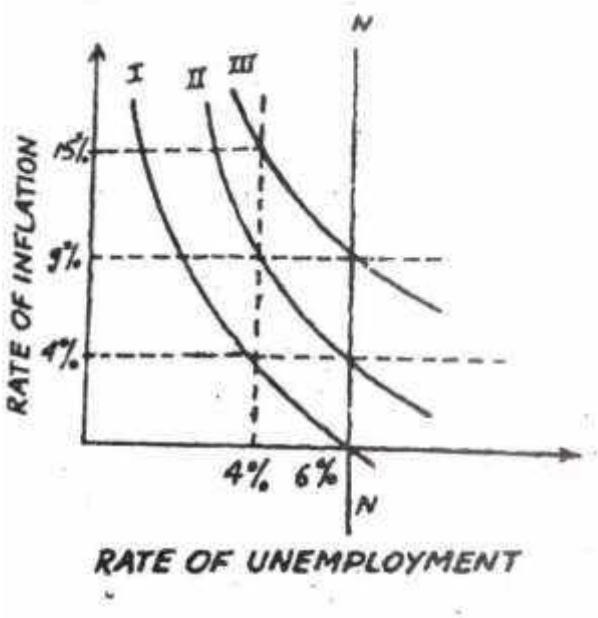


Fig. 22.5

In Fig. 22.5 curve is the standard Phillips curve intersections with the horizontal axis at the 6% rate of unemployment. Now let us suppose that the economy has been enjoying a long period of wage/price stability at this rate of unemployment implying that at this rate of unemployment the actual rate of inflation and the expected of inflation are the same (= zero rate). This means that this 6% rate of unemployment is the natural rate of unemployment and the economy has been successfully coping with the "full-employment" level of aggregate demand that is consistent with the natural rate of unemployment of 6%. Now let us suppose that the policy making authority drawing inspiration from the Keynesian economics in general and the Phillips curve in particular decides to lower the level of unemployment by 2% by using fiscal or monetary methods or some combinaton of both so that aggregate effective demand is raised. The Phillips curve I shows that the end result of it would be a rise in the rate of inflation from zero to 4%. The authorities assume that this trade-off between 2% less unemployment and 4% rate of inflation is socially acceptable.

The policy will be successful to start with. But the crucial question raised by Friedman was that, if the policy making and implementing authority (government) remains committed to maintain unemployment at 4% will the cost of such a commitment continue to remain at 4% rate of inflation. Phillips's analysis which concluded that the Phillips curve was stable will give a positive answer to it and it would be a correct answer provided the Phillips curve had been really stable. It is Friedman's contention that if we take not of the price expectation, the answer would be in the negative. His answer was that such a commitment would tend to accelerate the rate of inflation without changing the actual unemployment rate from the natural unemployment rate in the long run. This is explained hereunder.

As the money wage rate consequent upon the decrease in unemployment and the consequent increase in aggregate effective in inflation at the rate of 4% and so is also that rate of price inflation on the simplifying assumption that productivity remains constant, the workers increase the supply of labour mistaking the rise in the money wage rate for a rise in real wage rate. This implies that workers suffer from "money illusion". On the other hand, the rise in prices raises the revenues of the firms employing labour. So they are also willing to absorb more workers in employment. Thus, in the short run. level of employment rises and unemployment rate falls to 4% from 6%. But by and by both the parties would get over the money illusion as the rates of money wage and price inflation continue to be at 4%. Workers begin to realise sooner or later that their real wage rates have not risen at all. So they withdraw their labour from the labour market. The employers who, in the beginning, looked only at the rising prices and the consequent rise in their revenues begin to consider, by the passage of time, the rise in money wage rates and the consequent rise in their costs. So they also withdraw their demand from the labour market the rate of unemployment rises back to the natural rate of unemployment of 6%. But, in the meanwhile, both workers and employers will have come to expect that the money wage rates and prices would continue to rise at the actual rate of 4%. Therefore, the Phillips curve will now be such as would link the natural unemployment rate of 6% to the 4% rate of inflation. The Phillips I in Fig. 22.5 above relaties the 4% rate of inflation to 4% rate of unemployment which is less than the natural rate of unemployment of 6%. Hence this curve is no longer the relevant Phillips curve. It will, therefore. shift to the position II in which position the Phillips curve cuts the vertical line NN' indicating the natural rate of unemployment of 6% at the point which corresponds to the 4% rate of inflation which would become the stable rate of inflation, provided no further effort is made to lower the level of unemployment below the natural rate of unemployment =of 6%. Thus, in the long-run, there is no trade-off -between unemployment and inflation.

However, if the policy makers (government) are committed to maintain the rate of unemployment at 4% which is less than the natural rate, then, as shown by Phillips curve II, this fall back to the committed rate of unemployment of 4% can be purchased for (traded off against) not the 4% rate of unemployment but the 9% rate of inflation. Thus, this analysis of the long-run Phillips curve demonstrates that any intervention by the government to attain an unemployment rate lower than the natural rate will push the economy along a path of ever accelerating inflation. As shown by the Phillips curve I, the next effort of the government to maintain the unemployment rate at 4% will accelerate the inflation rate to 13%, and so on. Hence three is no trade-off between unemployment and inflation in the long-run, and thus the Phillips curve breaks down.

The implication of the long-run analysis of Friedman with the introduction of expectations and anticipations is that each time the government tries to manage the unemployment rate below its natural rate, the actual rate of inflation will come to be anticipated by the workers, the employers and other economic agents involved in nominal contracts extending into the future. Due to this, the actual unemployment rate will rise back to equal the natural rate of it. In other words, each such demand management attempt by the government will be successful only for a short period, but, in the long-run, each such attempt would shift the Phillips curve in the north-east direction as shown by the curves I, II and III, in Fig. 22.5 above. A given Phillips curve, therefore, cannot be stable. It is a purely short-run phenomenon. As a matter of fact, Friedman's analysis suggests that there would be an infinite number of Phillips curves, each one corresponding to a given expected rate of inflation.

Another implication of this analysis is that in the long-run the only unemployment rate which is consistent with a stable rate of inflation is the natural rate of unemployment. But there is no unique rate of inflation which is consistent with the natural unemployment rate. It can be consistent with any rate of inflation depending upon the position of the given short-run Phillips curve. Lastly, the analysis also implies the futility of attempts to interfere with market forces of demand and supply in the labour market in order to peg the unemployment rate at the level lower than the natural unemployment rate. Because such attempts can succeed only in the short period while in the long period they would fail in their objective, though they would set in prices in which inflation rate goes on increasing.

Self Check Exercise-3

Q1. Diagramatically discuss the lon run Philips Curve.

The Long-run Phillips Curve

22.6 Summary

Since wage cost constitute the back bone of the price structure, the economists interested in the study of supply analysis have focussed their attention on the relation ship between the rate of wage increase and the rate of labour unemployment in the economy.

In the Keynesian model once the full-employment level of out-put is reached and aggregate supply curve becomes vertical, further expansionary measures will only raise the price level and not employment. There is no trade off clash between inflation and unemployment. The simple Keynesian macro model is, however, not supported by empirical evidence.

British Economist A.W. Philips presented in 1958 on empirical theory of inflation commonly known as Philips curve. On the basis of the data for the period 1861-1957 in U.K., Philips found that there existed a stable, inverse and non linear relationship between the rate of change of money wage and unemployment rate. In other words, when unemployment is high, wages will tend to fall but slowly because of the downward rigidity of wage rates. The inverse relationship between the rate of change of money wages and the rate of unemployment is shown as a downward sloping curve, which is called Philips curve.

22.7 Glossary

The Philips curve suggests the extent to which monetary and fiscal policies can be used to control inflation without high levels of unemployment. In other words, it provides a guideline to the authorities about the rate of inflation which can be tolerated with a given level of unemployment.

However, the greatest significance of Philips curve lies in its bringing out into the open the dilemma which the policy makers have to face and which Keynesian were ever Quite aware not too vaguely. Thus we can state that the most important implications of Philips curve is that inflation and unemployment can coexist and that they are not antithetical or polor cases as misleadingly suggested in simple abstract.

22.8 Answers to Self Check Exercises

Self Check exercise -1

Ans.1. Refer to Section 22.1 and 22.3

Self Check exercise -2

Ans.1. Refer to Section 22.4

Self Check exercise -3

Ans.1. Refer to Section 22.5

22.9 References/ SUGGESTED READINGS

1. J.A. Trevithick, Inflation, Ch. 4
2. G.E. Makinen, Money, The Price Level, and Interest Rates, Ch. 11. pp. 342-46 and 359-62.
3. R. Dombush and S. Fischer, Macro Economics, Ch. 14, 15.

22.10 Terminal Questions

1. How does the Phillips curve represent a "trade-off" or a menu for policy choices ? Is there really a trade-off between unemployment and inflation?
2. Explain Friedman's view on the Phillips curve and bring out the implications of his long-run analysis.

*****

LESSON - 23

PROBLEM AND METHODS OF STABILISATION [MONETARY POLICY]

Structure

23.1 Introduction

Monetary Policy refers to the credit control measures adopted by the central bank of country. Johnson defines monetary Policy as policy employing central bank control of the supply of money as an instrument for achieving the objectives of general policy. The importance of monetary policy as on integral part of general economic policy has considerably increased in recent years.

23.2 Learning Objectives

After going through this Chapter you will be able:

- To know about Economic Stabilisation.

- To know the Meaning of Monetary Policy.
- To understand Monetary Policy as Interest Rate Policy.
- To know the Practical Difficulties of Interest Rate Policy.

23.3 Economic Stabilisation :

Macro-economic policy in modern economies can have various objectives such as attainment of full employment, the attainment of some target rate of growth, attainment of the balance-of-payments equilibrium, bringing about a balanced regional development and, last but not least, attainment of price stability. When we speak of economic stabilisation, it should not be taken to mean the objective of price stability alone. Price stability, though desirable on many of economic consideration, cannot be an end in itself. Price stability at the cost of a very high level of unemployment, for example, would not be socially acceptable. This meaning of economic stability has to be related to the other objectives also, specially to the objective of attaining full or near-full employment of the available labour as well as non-labour resources of the economy. It has also to be related to the objective of long term growth of the economy. The problems of employment and growth as well as price stabilising the balance of payments. Therefore economic stabilisation, in its broad and comprehensive sense, refers to the problems of setting the economy along a path of stable economic growth such that it avoids, on the way, violent up and downs of economic activity known as the business fluctuations, price instability and acute balance- of-payments deficit etc.

The main problem of economic stabilisation arises from the fact that stabilisation in one sense, say, for example, in the sense of price stability, will not necessarily bring about relevant stability in some other sense, it is because the various objectives or macro- economic policy mentioned above are not positively correlated with each other. A high stable level of employment, for example, may not automatically bring about price stability. If anything, as we saw in the lesson on the Phillips curve, such a policy may lead to a very high and ever accelerating inflation rate.

In view of the above, the term, economic stabilisation, is usually interpreted in the narrow sense of attaining near full employment of productive resources of an economy consistent with price stabilty and some desirable rate of growth over the long-run, avoiding on the way cyclical fluctuations in output and prices.

The instrument of macro-economic policy that are available to a modern community in order to try at achieving economic stabilisation in the above sense are generally listed as follows:-

(i) The monetary policy, (ii) the fiscal policy, (iii) the prices and incomes policy, and (iv) the debt management policy. However, we-shall be focusing mainly on the first two policies, the monetary and fiscal policies, in the present and the next lesson.

Self Check Exercise-1

Q1.What do you understand by economic stabilization?

23.4 The Monetary Policy: Its Meaning:

The very first question that is to be posed, while starting a discussion to monetary policy is: what do we exactly mean by the term, monetary policy? The traditional answer to this question would be that it is a policy aiming directly at altering the supply of money in order to vary the rate of interest. But it would be more appropriate to define it as referring to those measures which aim at inflauencing the level of total spending either through variation in the rate of interest or through changing the liquidity position of the economy. However it should be noted that even the fiscal measures may end up in the change in the level not only of total spending but also of the total supply of money. But this effect does not entitle such fiscal measures to be considered as a part of the monetary policy. The said effect is but a monetary effect of fiscal policy.

All the monetary explanations of business cycles, such as Hawtrey's and Fisher's, underline the strategic role played by the rate of interest and the availability of credit in causing cyclical fluctuations in economic activity. By implication these theories of business cycle suggest that by controlling the supply of money, the rate of interest and the supply of credit, it is possible to stabilise economic activity and to remove fluctuations. Our task is to explain how far such an assumption is valid. We shall perform this task in two parts, one dealing with the interest rate policy, and the other with liquidity or the availability of credit.

Self Check Exercise-2

Q1.What do you know about Monetary Policy?

23.5 Interest-Rate Policy:

The Interest-rate policy itself may be examined in two parts, one dealing with the short-term rate of interest, and the other with long term rate.

A change in the short-term rate of interest can be brought about by changing the bank rate-the rate at which the central bank of a country discounts the first-rate short-term bills like the treasury bills. It is assumed that a change in the bank rate directly influences the rate of interest charged by the commercial banks on their advances as well as the other short-term interest rates, such as those charges for money-at-call, bills discounted, hire-purchase finance, etc. The basic arguments of the advocates of an interest-rate policy is that rise in it raises the cost of credit and thus discourages credit-financed investment as well as consumption. On the other hand, a lowering of the rate of interest cheapens credit and thus encourages investment expenditure as well as consumption expenditure. Hence, the interest-rate policy can be manipulated in a contra-cyclical manner.

But the above argument could be valid only if the investment and consumption expenditures had been interest-elastic. It is highly doubtful if it is so. The short- term rate of interest is relevant to investment in inventories. A change in this rate is not likely to influence it significantly, insofar as interest makes up only a small part of the total costs. Similarly, it may not affect the consumption facilitated by the hire-purchase system for interest charges might make up a very small part of the total installment payment, Furthermore, because, in a modern society, most of the individual saving is done in a contractual form, such as provident- fund contributions and insurance premium, changes in the short-term rate of interest are not expected to influence the total spending in an economy to any appreciable extent.

However, although the interest-rate may not be quite helpful in checking an inflation or deflation, if has, at least, this negative virture that when manipulated contra-cyclically, it does not have the effect of adding to an inflationary or deflationary process.

Even if it is assumed that a change in the short-term rate of interest can effectively change the value of credit, it is, nevertheless, still doubtfull if this policy would be a desirable one, when we take some other factors also into consideration. For example, if the short-term rate of interest is increased with a view to control an inflationary situation, it may give rise to the following difficulties: (i) It will add to the balance-of- payment difficulties on current account by increasing the cost of short-term borrowing from abroad; (ii) It will increase the cost of serving the national debt: (iii) It may also tend to pull up the long-term rate of interest, as people may begin to expect a rise in the long-term rate of interest too, and thus they may begin to sell long-term securities in of which their prices will fall and the long-term rate of interest yielded by them will rise; (iv) It be with long-term objectives of economic policy.

Let us now examine the long-term rate of interest as a means of manipulating aggregate demand and thus influencing the level of economic activity. A little consideration will show that, while, under certain circumstances, it might be impossible to change the rate of interest, under other circumstances, even if the long- term rate of interest is amenable to control, it might fail to influence the aggregate spending. There might also be circumstances when a change in the long-term rate of interest might jeoparadise some other policy objective.

The first, and the most important, case where the interestrate policy may prove to be ineffective is the well-known Keynesian case of the "liquidity trap" during a depression, when the long-term rate of interest is already so low that the demand for holding money in the form of 'idle' cash balances has become infinitely elastic. In this situation, the rate of interest cannot be lowered either by increasing the supply of money or by decreasing the demand for holding "idle" cash balances.

According to the Keynesian hypothesis of the liquidity trap there might be some critically minimum rate of interest, like i_0 in fig. 23.1. at which the liquidity preference function becomes horizontal Indicating an infinite elasticity of demand for money. Let the liquidity preference function L_0, in Fig. 23.1 represent the initial position and let M_0 represent the initial supply of money. The equilibrium rate of interest is, then, i_0 at which there is a "liquidity trap". Decreasing the demand for money implies a leftward shift of liquidity function L_0 to a position like L_1 in Fig. 23.1. Apart from the fact that it is generally not possible for the policy-making and policy-implementing authorities to manipulate the demand function for money directly, such a shift of the liquidity function will fail to lower the rate of interest, as is shown in Fig. 23.1 for, the lower liquidity function L_1 too cuts the supply function of money M_0 at i_0 It is much easier for the monetary authority to increase the supply of money than to decrease the demand for money.

Let us now suppose that instead of decreasing the demand for money, the supply of money is increased to M_1. The equilibrium rate of interest still remains at i_0, it refuses to be lowered.

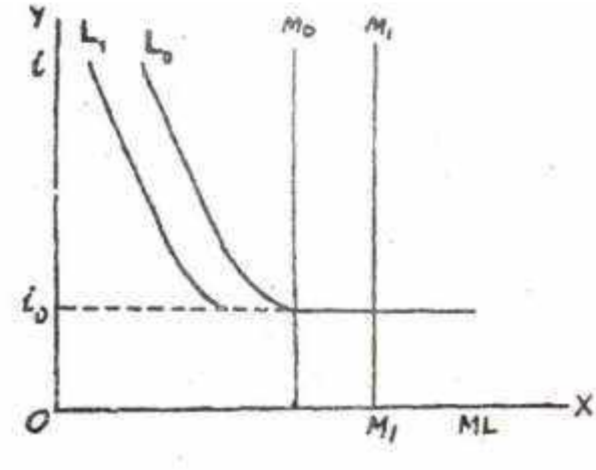


Fig. 23.1

The above, then, represents the case when it might not be possible to lower the long-term rate of interest, and, consequently, the monetary policy might prove ineffective.

Even when the situation is not as hopeless as in the above case of the 'liquidity trap' and it is possible to lower the rate of interest through an increase in the supply of money, the investment might be so interest-inelastic that it might not lead to any significant increase in investment expenditure and the secondary increases in output and employment, implied in the multiplier analysis, might be too microscopic in magnitude. We can illustrate this point with the help of a pure case in which investment function is perfectly inelastic, as shown in Fig. 23.2.

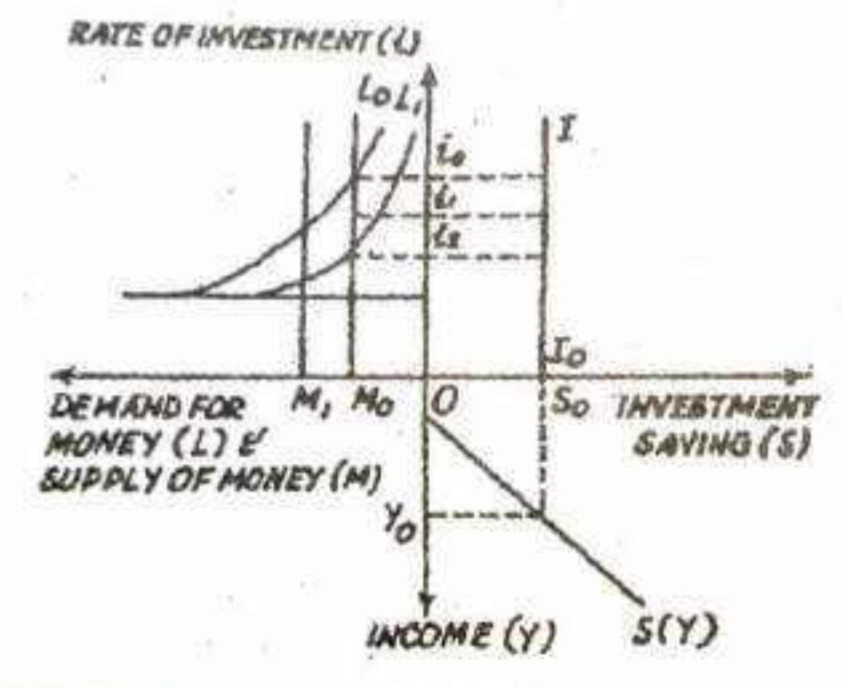


Fig. 23.2

In Fig. 23.2 above, the investment as a function of the rate of interest is shown to be perfectly inelastic. It is drawn as vertical in the first quadrant. In the second quadrant are drawn the liquidity preference functions L_0 and L_1 and the money supply functions M_0 and M_1. In the fourth quadrant is drawn the saving functions S Y on the assumption that saving is a function of the level of income. Let us assume that, in the initial position, the liquidity preference function is L_0 and the money supply function is M_0 so that the equibilrium rate of interest is i_0. At this rate of interest, the investment is I_0. This amount of desired investment would be exactly matched by the desired amount of saving at the level of income Y_0 as is clear from the fourth quadrant of Fig 23.2. We assume that Y_0 is less than full employment level of income. Now, the rate of interest can be lowered either by increasing the supply of money or by decreasing the demand for money. Let us suppose that the supply of money is increased to M_1. The rate of interest falls to i_1. But investment being perfectly inelastic with respect to the rate of interest, there is no change in investment, no change in the level of income; no change in saving; as shown in Fig. 23.2. Similarly, a fall in the rate of interest from i_0 to i_2, through a downward shift of the liquidity preference function from L_0 to L_1 fails to change investment, income and saving. Thus, the rate of interest can be lowered, but due to the insensitivity of investment to the rate of interest, the change in the rate of interest proves to be ineffective in increasing the total spending and the level of income.

In real world, investment would not be, perhaps, perfectly inelastic. But its elasticity with respect to the rate of interest may indeed be very low so that a proportionately much bigger fall in the rate of interest would be required to induce a given increase in investment. Such a reduction in the interest rate may not be feasible.

You may recollect that, in our lessons on the theory of investment, we had seen that there is a theoretical case for supposing that investment is interest-inelastic. We had also referred, there, to the corroboration lent to this hypothesis by a number of empirical investigations (you may, please, look up those lessons once again to refresh your memory on this point). This analysis implies that interest-rate policy will not prove to be an important for economic depression. The same analysis can be used to demonstrate that such a policy will not cut much ice in curbing a boom either (Please try to do it yourself with the help of a diagram like the one in Fig. 23.2. If investment is a function more of expectation and technology, it is the shifts in the in the investment function which will prove to be more effective in raising the levels of investment and income rather than changes in the rate of interest.

It may, however, be claimed that a change in the rate of interest may become an indirect cause of a shift in expectations and in the investment functions. Lowering of the rate of interest may be taken as the herald of an expansionary policy on the part of the government. This may make businessmen optimistic, with the result that the MEC and investment schedules hose are shifted upward. On the other hand, an increase in the rate of interest during a boom may be taken as the herald of a contractionary policy by the government, which, ultimately, has the effect of shifting down the investment function. But such an indirect effect of change in the rate of interest can at best, come about in the midway stage between boom and depression. When the boom is already astride, a high rate of interest will fail to rein it in. On the other hand, when the economy has already slumped into depression, no decrease in the rate of interest may succeed in reviving the confidence and shifting the investment function upward.

Self Check Exercise-3

Q1.What do you know about Intrest rate Policy?

23.6 Practical Difficulties of Interest-Rate Policy

The above analysis highlights the ineffectiveness of the interest rate policy, except when it indirectly has the desirable effect on expectations. But, the fact is that such a policy might be undesirable (even when it is effective). for it might conflict seriously with other policy objectives. Firstly, a small change in the long-term rate of interest may create complications in the short-term market. A given increase in the long-term rate of interest may cause expectation of a decrease in it in future, especially if the higher rate of interest is believed to be above the 'normal'. In other words, the prices of long- term bonds would be expected to rise in future. This will induce bondholders to switch over to long-term-bonds from the short term. The prices of the latter will fall heavily, and, in consequence, the short term rate of interest will rise very much, Secondly, a higher rate of interest increase the cost of borrowing from abroad, especially when there has been a considerable impact on the short-term rate. This increases invisible payments on the current account of the balance of payments. Thirdly, a higher rate of interest increases the cost of domestic borrowing. Fourthly, the interest-rate Policy is non-discriminatory as between firms exporting a high proportion of their outputs and firms which do not, and also between of high and those of low social value. Fifthly, interest-rate policy might increase instability. This risk arises from the problem of 'timing' the change in the rate of interest and its ultimate effect on the economy. The decision to change the rate of interest may quite well come about at a wrong time, thus adding to instability rather than checking it. For example, if the rise in the rate of interest happens to coincide with a downturn in investment activity, it will aggravate the downward trend of economic activity.

All the above considerations may make this policy to some extent undesirable.

In view of the limited effectiveness of an interest- rate policy, on the one hand, and also a limited desirability of it, on the other, it is now recognised that this policy can at best, be used as one of a number of policies, rather than to put reliance on it alone. The obvious implication of the preceding statement is that at times, at least, resort to an interest rate policy may be desirable. If it is desirable to control the rate of interest, it makes it also desirable to control the availability of credit or the liquidity of the credit market. This brings us to the discussion of the liquidity aspect of the problem.

Self Check Exercise-4

Q1.Discuss practical difficulties of Intrest rate Policy.

23.7 Liquidity or Availability of Credit

"If a high long-term rate of interest is deemed to be undesirable on the grounds mentioned above or on some other grounds involving the interest of the economy, the rate of interest can be 'pegged' at a level lower than one which would prevail under the free play of the market forces. But this will create situation of "excess" demand in the credit market. This 'excess' demand can be reduced, if it is deemed to be desirable from the point of view of the policy goals, by increasing the liquidity of the credit market. On the other hand, if it is decided to be desirable in terms of the policy goals to reduce the total volume of credit without a resort to an increase in the rate of interest, the liquidity will have to be decreased.

Now the question is how the liquidity of the economy is increased or decreased. Basically, the more liquid is the position of the banks, the greater is the liquidity of the economy as a whole. The liquidity of the banks depends on their liquid or cash reserves. The central bank of a country can change the liquidity of the banking system as a whole through the manipulation of instruments which ultimately tell upon the reserves of the member banks. These instruments are open-market operations and variation in the obligatory cash reserves to be kept by the member banks with the central bank. The purchase of long-term securities by the central bank from the member banks as well as the non-banking public has the effect of pumping liquid assists into the reserves of the member banks and thus increasing the liquidity of the system. The sale of long-term securities by the central bank to banks and non-banking public has the effect of depleting the reserves of the banks and thus decreasing the liquidity of the system as a whole. The same effects can also be achieved by decreasing or increasing the ratio of the obligatory deposits to be kept by member banks with the central bank.

However, a distinguishing feature of the post-war situation has been that the liquidity of an economy has been seldom increased to the eliminating of 'excess' demand from the credit market altogether; as in the case of commodity markets, it necessities the institution of 'rationing' of credit, that is, direct controls over the supply of credit. Rationing of credit may work through imposing limits of some sort on the maximum credit that can be granted by a bank to its clients. More important is the fact that such a policy can be made discriminatory as between different uses for which credit is advanced. Another merit of such a policy is that direct controls on credit can be introduced or changes quickly. Moreover, the effects of such changes are felt quickly.

However, the policy of direct controls is not without its limitations. They tend to freeze the economic activity into the existing channels, because controls tend to prevent efficient firms from expanding and they inhibit innovation. At best, controls are effective only in boom. Even that much is doubtful, for, when the borrowers cannot get loans from the banks, they manage to get credit from outside the regulated bank system by offering higher rates of interest. This possibility has increased recently due to the growth of non-bank financial intermediaries like insurance companies, mutual aid societies, building societies, finance companies, and, in our country, we have still quite a large indigenous banking sector which falls outside the controls of the Reserve Bank. Since the governments usually persists in borrowing through the Sale of treasury bills in order to keep the burden of servicing national debt low, this very act of the government has the effect of increasing the liquidity of the system. The fact is that no control of bank advances can ever succeed for long in reducing the aggregate expenditure, unless it is backed by general restriction of liquidity and a general increase in interest rates.

Moreover, the borrowers, who are denied credit under a policy of direct controls, are generally those who need funds so urgently (in order to finance short- term investment, or to complete investment projects already under way) that they are not discouraged by higher rates of interest charged by the non-bank financial intermediaries. The implication of it is that the main effect of interest-rate policy is likely to be exerted on the long-term investment plans and will thus operate with a substantial time lag. This further implies that even for controlling an inflationary situation, monetary policy is not enough in itself. It has to be reinforced with a fiscal policy. And, when we remember that neither the lowering of the rate of interest to the utmost extent possible, nor a large increase in liquidity, can cure a depression by themselves, for as the hackneyed but very apt saying goes, 'you can take the horse to water but you cannot make it drink', the necessity of a complimentary fiscal policy alongwith the monetary policy for controlling fluctuations of economic activity becomes more than obvious.

Self Check Exercise-5

Q1. How the liquidity of the economy is increased or decreased?

23.8 Summary

Monetary Policy in an underdeveloped country plays on important role in increasing the growth rate by influencing the cost and availability of credit. Monetary Policy is an important instrument for achieving price stability. It brings a proper adjustment between the demand for and supply of money. Monetary Policy in the form of interest rate Policy Plays an important role in bridging the balance of payment deficits. Monetary Policy in underdeveloped countries create banking and financial institutions in order to encourage, Mobilise and Channelise savings for Capita formation. Thus an appropriate monetary Policy, as outlined above, helps in controlling inflation, formation and promoting economic growth.

23.9 Glossary

Since the depression of 1930's right up to 1950's there had been a wide spread belief that Monetary Policy is relatively ineffective in controlling depression. In comparison, it was believed to be more appropriate to deal with boom and inflation. It must be recognised that the degree of efficacy of monetary controls during severe declines is rather too weak. The central bank in such a situation can release large cash to be made available at lower cost to different categories of borrowers.

23.10 Answers to Self Check Exercises

Self Check exercise -1

Ans.1. Refer to Section 23.3

Self Check exercise -2

Ans.1. Refer to Section 23.4

Self Check exercise -3

Ans.1. Refer to Section 23.5

Self Check exercise -4

Ans.1. Refer to Section 23.6

Self Check exercise -5

Ans.1. Refer to Section 23.7

23.11 SUGGESTED READINGS

1. F.S. Brooman, Macro-economics 4th ed. Ch. 10.
2. R.F. Harrod, Money, Ch. 10.
3. Redcliffe Report Chs. 2, 5, 6, 7.
4. D.C. Rowan, Output, Inflation and Growth Ch. 24.
5. E. Shapiro, Macro-economic Analysis Ch. 25.
6. R. Dornbusch and S. Fischer, Macro-economics Ch. 4, 17, 18.

23.12 Terminal Questions

1. Explain how monetary policy works as an instrument of economic stabilisation.

2. What is meant by economic stabilisation? Examine the effectiveness of monetary policy as a method of stabilisation.

Unit - 24

THE FISCAL POLICY

Structure

24.1 Introduction

We examined, in the previous lesson, the monetary policy as a variant of macro-economic policy having the objective of stabilising the level of economic activity. We had found, there, some serious limitations on the policy, particularly in times of depression when, according to Keynes and his followers, there is the liquidity trap in the money market and no amount of increase in the supply of money can cause the rate of interest to fall so that the investment might increase, Moreover, as it was noted in the lesson, even if the rate of interest is brought down despite the liquidity trap, and the liquidity of the economy is increased, investment may refuse to increase because of the adverse expectations of the investors. It was this realisation that made Keynes emphasise the fiscal policy, rather than the monetary policy, as an instrument of controlling the level of economic activity, particularly during a depression. However, this should not be taken to mean that fiscal policy is recommended to the exclusion of monetary policy. In fact, both to be employed to reinforce each other, although the main reliance has to be put on the fiscal policy especially during depressions.

24.2 Learning Objection

After going through this chapter you will be able to :

- know the meaning of fiscal Policy
- understand discretionary fiscal Policy
- understand fiscal Policy as Taxation Policy
- understand fiscal Policy as Public Expenditure Policy

24.3 The meaning of Fiscal Policy

What do we mean by fiscal policy? Obviously, it refers to the government policy with respect to its taxes and expenditures, A more precise definition of it may be given in the words of G. K. Shaw who defines it "to encompass any decision to change the level, composition or timing of government expenditure or to vary the burden, structure of frequency of tax payment." the objective of the changes, referred to in this definition, may be to influence the level as well as the pattern of economic activity. However, as in the case of the monetary policy, we shall be discussing fiscal policy in relation to the problem of stabilising the level of economic activity.

It should be noted that the changes in the government expenditures and taxes are of two types; changes which work automatically without any active decision of the government and the changes wich are the result of an active decision taken by the government and are, therefore, discretionary in nature. Strictly speaking it is the latter changes which truly make up fiscal policy, as should be obvious from Shaw's definition given above. However, the former changes have an importance of their own in relation to the level of economic activity, and they cannot, therefore, be ignored. We start the discussion with the automatic type of changes.

Self Check Exercise-1

Q1. What is the meaning of Fiscal Policy?

24.4 Rules Versus Discretion:

The case for rules, setting up a formula governing the changes in the government expenditures and taxes in order to stabilise economic activity through fiscal measures, is based upon the working of automatic or built-in stabilisers. The contra cyclical changes in tax revenues and expenditures of the government, which take place independently of any discretionary policy decision by the government, are known as automatic or built-in stabilisers. On account of the fiscal character of a modern economy, tax revenues are positively related with changes in the level of national income, while government expenditures of certain types are inversely related with the changes in the level of national income. On account of these functional relationships, budgetary surplus tends to increase, or, there is a deficit, it tends to decrease during the upswing of a business cycle, thus reducing the inflationary positional of the economy. On the other hand, budgetary surplus tends to be reduced or a deficit tends to be increased during the downswing thus restraining the deflationary potential. And, all this takes place without any active fiscal decision by the government. This explains the name automatic or built in stabilisers given to them. They are generally found in the form of taxes, social security contributions, and unemployment insurance benefits, and agriculture subsidies etc.

Tax revenues increase and decrease with a rise or fall in economic activity, when when the rates remain unchanged. This will take place even when the tax system is a proportional tax-system: the tax revenues. In this case, change in direct proportion with changes in the level of income. However, in almost all the countries in modern times, the income-tax system, at least, is a progressive system in which higher income are taxed at progressively increasing rates, with an exemption limit, incomes below which are not taxed. As incomes go on rising during an upswing, more and more individuals cross the exemption limit and fall into the income tax rt. Secondly, incomes already subject to taxation rise to come within the higher brackets subject to higher rates. Consequently, tax revenues increase, infect, more than proportionately with increasing income during the upswing. Other things remaining the same, it has the effect of automatically increasing the budgetary surplus or, if there is deficit in the budget, reducing the budgetary deficit as the case may be.

The above mechanism works in the reverse direction during the downswing. (The student is advised to spell the above argument in the case of a downswing). The result is that, other things remaining the same, the budgetary surplus is reduced or, if there is a deficit, the budgetary deficit is increased. This acts as a brake on the downward movement in the level of economic acticity.

Modern states prefer to be welfare states, and, in such states, social security contributions and social security benefits are common feature. During a upswings of economic activity, social security contributions by workers and employers increase in amounts, linked as they are with wages and wage-bill. They automatically decline with falling wages and increasing unemployment during the downswing.

The automatic changes in taxes and social security contributions described above reduce the disposable income during the upswing and they tend to increase the disposable income during the downswing, and thus these changes tend to stabilise the fluctuations in the consumption expenditure of the community. Ultimately, it contributes to stabilise the aggregate expenditure too. Similarly due to increasing tax payments and social security contributions of firms during the upswing, their net profits rise less than they would otherwise, and, during the downswing, the tax payments and social security contributions of firms decreases and thus their net profits are made higher than they would be otherwise. All this causes contracyclical changes in private investment expenditure and thus helps to stabilise economic activity.

The government expenditure on account of social security benefits, particularly on account of employment relief, tends to decrease during the upswing when unemployment goes on decreasing. During the down spring, on the other hand, the expenditure increases, for unemployment is then on the increase. Many governments are usually committed to support agricultural prices or give subsidies to the farmers, if the agricultural prices fall below fixed minimum. a Obviously, government expenditure on this account generally decreases during the upswing and increases during downswing. Thus, the government expenditure under these heads varies in a contracyclical manner on account of which fluctuations in economic activity are reduced.

Although there is an opinion, as represented by a few economists like Milton Friedman (If. his "A Monetary and Fiscal Framework for Economic Stability"), according to which only automatic stabilisers should be relied upon, yet, as we shall presently see, such a policy suffers from serious limitations on account of which it might prove to be quite ineffective.

In the first place, automatic stabilisers respond with a time lag. Insofar as fluctuations are caused by changes in expectations which, if not checked in time, get momentum, a check would be required before the aggregate expenditure actually begins to decline, and the aggregate expenditure would require a shot in the arm before the automatic stabilisers begin to operate during a downswing. Secondly, the lagged response of automatic stabilisers might accentuate rather than decrease fluctuations. This lag is greater when income taxes to be paid in the current year are assessed on the income of the previous year. If the level of income in the current year has fallen, the individuals and firms have to pay taxes assessed on the basis of the higher level of incomes of the previous year. This will tend to aggravate rather than lessen the decline in the level of income and employment. Thirdly, we know it from the fiscal model of the multiplier, discussed in an earlier lesson that due to taxes the value of the multiplier is reduced but it cannot be zero, for the multiplier is $\frac{1}{1-b+t}$ where b is the marginal propensity to consume disposable income and t is the marginal propensity of tax revenue. Unless the value of t is very high, the value of the multiplier cannot be substintially reduced And very high tax rates for the aggregate incomes, as distinguished from a microscopic part of it which falls within the top bracket, are seldom to be found. this means that the damping effect of taxes on the fluctuatons in the level of income and employment, caused by some autonomous change in private investment or government expenditure, is generally very feeble fourthly, the proportion of the total government expenditure that varies inversely with changes in the level of economic activity, such as expenditure on social security benefits and agricultural subsidies is rather too small. It is because a good deal of government expenditure on social security because a good deal of government expenditure is dictated by policy, as in the case of interest payment on public debt. Thus a very huge portion of public expenditure is independent of the level of economic activity.

The effectiveness of the automatic stabilisers is somewhat enhanced through 'formula flexibility', that is, through laying down fixed rules, according to which tax rates and expenditure rates are varied according to a predetermined formula such that tax rate are automatically increased and expenditure rates automatically decreased, according to the stipulated formula, during expansion; and tax rates are automatically decreased and expenditure rates are automatically increased during contraction. But the difficulty is that cyclical fluctuations often vary in intensity as well as cause. Therefore, a formula which might be right in one situation might not be right in another situation.

It follows, therefore, that discretionary fiscal policy is indispensable for reinforcing or modifying the effect of the built instabilisers, including the built-in formula flexibility. This brings us to be discussion of the discretionary fiscal policy.

Self Check Exercise-2

Q1. Discuss Rules Vs. Discretion of Fiscal Policy.

24.5 Discretionary Fiscal Policy

Discretionary fiscal policy refers to the deliberate manipulation of government expenditure and taxes on the basis not of a previously determined formula but of the judgment of the fiscal authorities, so as to influence the level and structure of aggregate expenditure as well as of taxes of the economy in the desired direction. The discretionary fiscal measures may take any of the following three forms or some combination of them:

(i) Changes in the tax structure which influence, indirectly, the private consumption as well as private investment.

(ii) Changes in the level of taxation which influence the disposable income with consumers and the net profits (net of taxes) of business firms.

(ii) changes in the level of government expenditure.

Self Check Exercise-3

Q1.What is Discretionary Fiscal Policy.

24.6 Taxation Policy

Changes in the tax structure alter the distribution of income and wealth, and they may thus cause a shift in the consumption function. During contractions and depressions, the tax structure can be made more progressive so that its burden falls much more on the classes which predominantly do the savings and less on the classes which largely consume their incomes. This pushes up the consumption function indicating that a larger proportion of the community's income would be spent on consumption. In theory, the consumption function can be shifted down during booms by imposing a greater tax burden on the low-income groups who have higher marginal propensity to consume and less tax burden on high-income groups whose marginal propensity to consume is less. But, in practice, such a policy will not be politically feasible. Even in the case of depression, such a measure may not be quite effective. Insofar as the investors generally belong to the rich classes of the society, shifting of an increasing burden of taxation on to them might discourage investment expenditure. If it is so, what is gained on the consumption front is lost on the investment front and thus there might be little or no increase in the aggregate expenditure and the economy might not pick up. It is, therefore, generally inadvisable to depend on changes in the tax structure in order to influence the aggregate expenditure. It is better and more practicable to influence it through changes in the level of taxation.

Changes in the level of taxation influence the aggregate expenditure through their effects on the disposable income, on the one hand, and on net profits (net of taxes) on the other. When the level of economic activity is at a low ebb, the situation may be sought to be remedied through a reduction of the overall level of taxation; some taxes might be abolished, while the rates of other might be reduced. The reduction of tax rates on personal incomes increase the disposable income, and, consequently, the total consumption expenditure increases. The abolition and/or reduction of taxes on corporate incomes increases profits net of taxes, which may raise the marginal efficiency of capital, Besides, various types of refinements can be introduced in the tax system so as to encourage investment expenditure; for example, rebate might be given in taxes in respect of profits which are reinvested. If successful, these policies increase investment expenditure. Thus, tax policy may be mobilised to increase consumption as well as investment expenditure. If the government expenditure is not decreased correspondingly, the aggregate expenditure in the economy increases, which pulls up the economic activity in general. This precondition, in fact, implies that the fiscal authority should deliberately allow tax revenues to fall below government expenditure and, thus, should adopt a Policy of deficit budgeting, when fall of economic activity is to be checked or when economic activity is to be rescued from the slough of depression.

When there is boom and aggregate expenditure of the economy overreaches the aggregate full-employment level of real income, 'inflationary gap' develops, which might engender a serious inflationary process. In order or prevent emergence of such a situation, the measures mentioned in the preceding paragraph might he employed in the reverse gear. New taxes may be imposed and the rates of existing taxes may be imposed and the rates of existing taxes may be increased. This has the effect of reducing disposable income, on the one hand, and diminishing net profits, on the other. The former tends reduce the private investment to expenditure. If the government expenditure is not correspondingly increased at the same time, it is expected to reduce the aggregate expenditure in the economy and given the proper extent of the rise in the level of taxation, the boom might well be brought under control. You might easily see that the policy, adumbrated in this paragraph, implies a fiscal policy which deliberately allows tax revenues to exceed government expenditure; in other words, it implies a policy of 'surplus budgeting'.

It should be realised that a deficit or a surplus can be created by manipulating either taxes or government expenditure or both. But, in the preceding paragraph, we had the first of these alternative in our mind.

The above simple account of the policy of changing the level of taxation to control the level of economic activity might suggest it to be a simple affair. But, the fact is that there are various limitations of such a policy, on account of which the actual effects of such a policy might fall short of desired effects. Firstly, there is the practical difficulty in view of the general convention of having annual budgets which means that major adjustments can be made only in frequently, Apart from this practical difficulty, this policy will have the desired effect of changing private consumption expenditure, if spending changes directly with changes in the disposable income. If there is depression, for example, and taxes are reduced to increase the disposable income, aggregate expenditure will ease only if, other things remaining the same, corruptions expenditure increases. The Keynesian theory of consumption function does predict this result. But this theory also suggest that the extent of such an effect might be insignificant, if the main beneficiaries of the policy are only the richer classes. On the other hand, during booms, the policy might prove to be ineffective, if a reduction in disposable income, concomitant with a rise in the level of taxation, results not in decrease of consumption expenditure but in a drawing down of savings.

When we come to consider the effect of this policy on investment expenditure, we may find the limitation to its effectiveness much more serious than in the case of the consumption expenditure. During depressions when business expentations are extremely pessimistic, incentives in the form of reduced tax rates might fail to revive optimism among the investing class which is necessary for the revival of the investment activity. During booms, on the other hand, profits might be too high and business expectations rather too optimistic for increased taxation to have any significant effect on investment.

In addition to the above difficulties, there is also the problem of timing. As in the case of the monetary policy, the problem of timing is extremely important and, at the same time, very difficult too. A change in the level of taxation, if it comes about a little too soon or a little too late, might cause contrary effect. Tax changes have their effects after a time-lag. If appropriate allowance for such time-lag is not made, this policy may quite well aggravate rather than alleviate fluctuations in economic activity.

There is the further difficulty, namely, that the attempt to influence aggregate expenditure of the economy through the manipulation of the level of taxation might conflict with some other policy objective. For example, surlus budgeting via a rise in the level of taxation might adversely affect incentives jeo-paradising the desired rate of growth of the economy.

Furthermore, the aggregative analysis of the effects of changes in the level of taxation blinds us to the problem of directing the aggregate demand into particular regions and sectors. If unemployment, for example, is heavily concentrated in particular industries or particular regions, the over-all aggregative tax policy may not prove to be effective. This consideration may call for a policy other than a mere fiscal policy manipulating taxes or public expenditure or both.

Self Check Exercise-4

Q1.Discuss Fiscal Policy as Taxation.

24.7 Public Expendirue Policy:

Another/type of changes in fiscal policy which can be employed to influence aggregate expenditure of the economy and thus to stabilise the level of economic activity is the deliberate contracyclical changes in the government expenditure.

Ever since the Second World War the share of government expenditure in the aggregate expenditure has been increasing and has become quite sub s tantial even in those modern economics which are professedly based on the private enterprise. Consequently, manipulation of government expenditure has become an important instrument of controlling the aggregate expenditure and the level of economic activity. You will recall from the fiscal model of the multiplier that any change in government expenditure is subject to the regular multiplier effect. Therefore, if it is adjudged expenditure of the community which otherwise is falling or is inadequate to maintain a stable full or near-full employment level of income, should be increased, the government can bring about this result by increasing its own expenditure, which through the multiplier effect. Therefore, if it is adjudged to be desirable in the interest of stability that the aggregate expenditure of the community which otherwise is falling or is inadequate to maintain a stable full or near-full- employment level of income, should be increased, the government can bring about this result by increasing its own expenditure, which through the multiplier effect, will increase the aggregate expenditure and income of the economy manifold times the increase in the government expenditure. Similarly, when it is a adjudged to be desirable in the interest of stability to curb the rising aggregate expenditure of the economy, this objective can be achieved by decreasing the government expenditure. The multiplier, then, operates downward, and the level of aggregate expenditure and national money income are brought down to the proper level. It can be seen, therefore, that the changes in the government expenditure serve the purpose of removing the "inflationary gap" or filling up the "deflationary gap" in order to stabilise the full employment level of income.

Government expenditure may be changed and, yet, the budget may balanced one, if taxes are also changed so as to leave the revenue and expenditure of the government to be equal. You should again, be able to recall from the fiscal model of the multiplier that in such a case the value of the multiplier will not be zero but unity. In any case, it will be too weak to be a useful tool of manipulating the aggregate expenditure. It is therefore, understood that when government expenditure is increased in order to raise the level of the aggregate effctive demand, taxes will not be increased to meet the increased expenditure. Similarly, when the government expenditure is decreased to curb the rise in aggregate expenditure, it is understood that taxes will not be reduced along with it. This, also amounts to the adoption of the policy of 'deficit budgeting' during depression or contractions and of "surplus budgeting" during boom and expansion. How then it is different from the tax policy which too, as we have already noted, result in "deficit budgeting" during depression and contractions, and "surplus budgeting" during boom and expansion? the difference lies in this that while one policy operates through changing the government expenditure, leaving taxes more or less unchanged the other policy implies the reverse of it, and this difference is quite important. If a given amount of deficit is created by reducing taxes the multiplier effects less then when the same amount of deficit is created by increasing the government expenditure alone. In the former case, the multiple is $\frac{b}{1-b}$ where b is the marginal propensity to consume, but, in the latter case, it is $\frac{1}{1-b}$ which is greater then $\frac{b}{1-b}$ because I > b. This is the one reason on which other things remaining the same, a policy of manipulating government expenditure may be preferred to a policy of manipulating taxes in order to bring about a given amount of "deficit" or "surplus" in the budget. However this observation is made only to highlight the difference between the strengths of the multiplier effect in the two extreme cases. In practice, it is always judicious and, to some extent even, unavoidable to combine the two instruments, government taxes and government expenditure, to achieve a given objective.

It should be noted that taxes are not the only means of financing a budgetary deficit ;it can also be met through public loans. If it is so, a policy of "deficit budgeting" will have the full multiplier effect, only if the funds received from the public as loan would have been hoarded rather then invested by the public. In fact, we pointed out a number of limitations of a simple fiscal model of the multiplier in the lesson on the Balance Budget theorem. it will be useful to go back to this lesson and take note of their imitations.

A public expenditure policy aimed at varying the government expenditure on public works, such as roads, canals, hospitals, schools, or varying the investment expenditure in nationalised enterprises, is much more effective than a public expenditure policy aimed at stimulating the private investment and consumption expenditure through measures like subsidies and interest-free loans. The reason of the relative ineffectiveness of the latter is that here the initiative is left to the private agencies. Even if it is assumed that the initiative would, in fact, be taken by the private individuals and firm the multiplier effect in this case would be less than in the case of direct expenditure by the government of public works or investment in the nationalised industry. Sublidies or interest-free loans are just transfer payments, any change in which is subject to the multiplier effect, $\frac{b}{1-b}$ which is less than the government (direct) expenditure multiplier which is $\frac{1}{1-b}$.

Apart from the limitations on the fiscal mulptlier mentioned in the lesson on the Balanced Budget Theorem this policy of varying public expenditure in a contra cyclical manner suffers from the following practical difficulties: (1) some government expenditure may simply substitute private expenditure. Government expenditure on health services and education may have this type of effect. To the extent it actually happens, the total increases in aggregate expenditure may be little. (2) Any policy of public works must be planned in advanced and it is essential that no time is lost in stimulating demand when a recession begins. But, in practice, some delay is inevitable, because plans have to be prepared and approved, land has to be acquired, and contracts are to be given, which may involve quite a long time-lag between the conception and the inception of the public works programs. (3) Insofar as this policy suggests the postponing of public works during booms and shelving them till the times of contraction in economic activity, this is not always practicable. For example, roads, hospital, schools, dams and canals and investment in public enterprises cannot be postponed till private expenditure beings to fall off. Such a policy may conflict with the long-term goals of the society. (4) However, the greatest danger may come from the unavoidable time-lag between the conceiving of a public works programmes and its actual execution. The multiplier effect of an increase is government expenditure may, show itself when the expansion is already under way, thus accentuating the upward instability. Similarly, due to the wrong timing, a decrease in government expenditure may show, itself when contraction is already in full swing, thus aggravating the deflationary process.

Self Check Exercise-5

Q1.Discuss Fiscal Policy as Public expenditure Policy.

24.8 SUMMARY

In view of the limitations of the various policy tools, it is now generally recognized that none of these tools, can be usefully employed, if it is to be used the exclusion of all others. All these policy tools will have to be judiciously combined in an effective macro-economic policy aiming at stability. There has to be a proper combining of public expenditure policy with the tax policy which should take care of not only the level of taxation but also the tax structure. And the fiscal policy as a whole must be used in conjunction with the monetary policy so that each reinforces rather than stultifies the other.

24.9 Glossary

- Fiscal Policy Plays a dynamic role in developing countries. Infact an extensive use of fiscal policy is indispensable for economic development. Fiscal Policy, in the words of Nurkse, "assumes a new significance in the face of the problem of capital formation in underdeveloped countries.
- Fiscal Policy aims at the promotion and alliteration of the rate of investment in the private and Public sectors of the economy.
- Fiscal Policy encourages the flow of investment into these channels which are considered socially desirable.
- Fiscal Policy aims at increasing employment opportunities and reducing unemployment and under employment.
- Fiscal Policy Promotes the maintenance of reasonable economic stability in the face of short run international cyclical fluctuations.
- Fiscal Policy aims at counteracting inflationary tendencies inherent in a developing economy.
- Fiscal Policy increases national income and redistribute it in such manner that the extreme inequalities of income and wealth are reduced in the economy.

24.10 Answers to Self Check Exercises

Self Check exercise -1

Ans.1. Refer to Section 24.3

Self Check exercise -2

Ans.1. Refer to Section 24.4

Self Check exercise -3

Ans.1. Refer to Section 24.5

Self Check exercise -4

Ans.1. Refer to Section 24.6

Self Check exercise -5

Ans.1. Refer to Section 24.7

24.11 References/ Suggested Readings

1. F. S Brooman, Macro-economics Ch.9.
2. Dernberg and McDougall, Macro-economics Ch.6.
3. M.G. Muller (ed.), Readings in macroeconmics Reading no.25 by A. P. lerner.
4. R.A. Gordon, Business Fluctuation ch.20.
5. E. Shapior, Macro-economic Analysis Ch.24.
6. R. Dombusch and S. Fischer, Macro-economics. Chapter 5, 18.

24.12 Terminal Questions

1. What is meant by fiscal policy? How does it help in stabilising economic activity?
2. What is deficit budgeting? Explain its utility. Should a deficit in budget be caused by reducing taxes or government expenditure?

Unit - 25

MORE ON STABILISATION PROBLEMS

Structure

25.1 Introduction

The relative effectiveness of monetary and fiscal policy has been the subject of controversy among economists. The Monetarists regard monetary policy more effective than fiscal policy for economic stabilisation. On the other hand, the Keynesian hold the opposite view. In between there two extreme views, there are the synthesis's who advocate the middle path. Modern economists explain these three views in terms of the elasticities of the IS-LM and the LM curve represent Monetary Policy.

25.2 Learning Objectives

After going through this chapter you will be able to :

- know Income Policy
- know Problem of Stabilisation
- understand the Role of Expectations
- understand Budget deficit and Inflation

25.3 IS-LM Model and Alternative Stabilisation Policies

In the proceding two lessons, we discussed two alternative stabilisation policies, namely, the monetary policy and the fiscal policy. That stabilisation can be attempted through either type of policy is, in fact, an important implication of the IS-LM model that we have explained in an earlier lesson. This implication is brought out hereunder with the help of Fig.25.1.

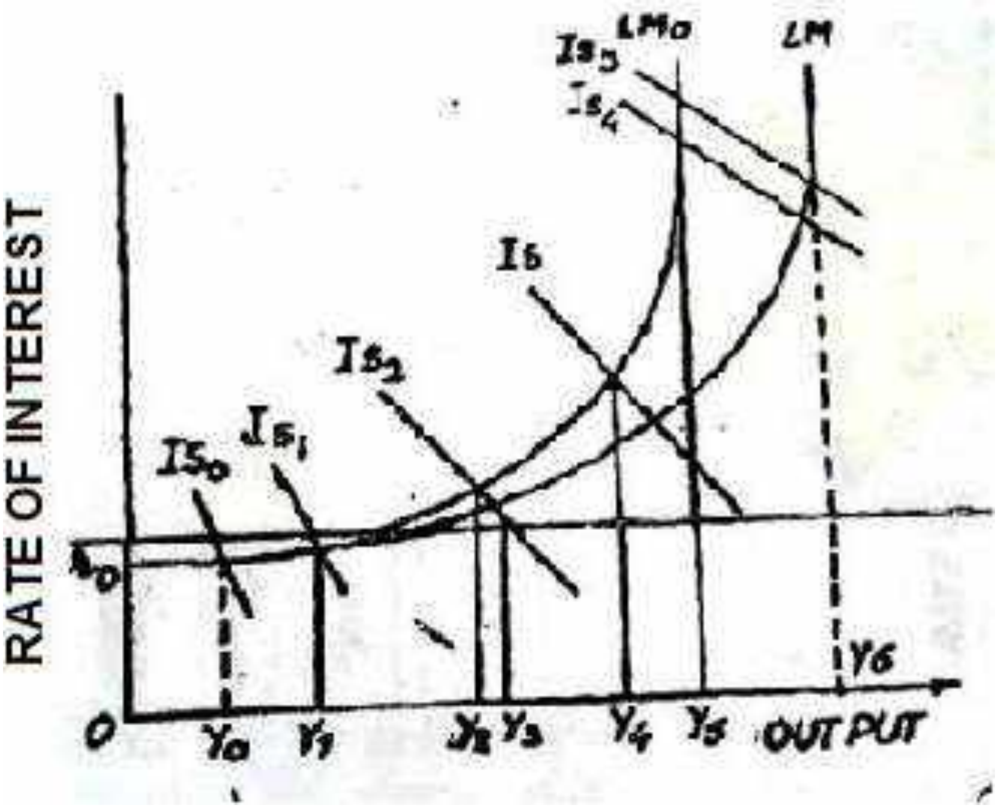


Fig. 25.1

In the above fig.25.1,ISO, IS_1, ... are the various IS- curves, LM curve is drawn on the assumption of a given stock of monly Mo LM- curves becomes vertical at a very high level of real output. At a critically minimum rate of interest r_0 they become horizontal. You can also recall that the LM curve represent money market equilibrium and IS-curves represent product market equilibrioum. And, equilibrium level of out put (y)and equilibrium rate of interest are determined simultaneously by the intersection of these two curve when there is general equlibrium and both the product market and money market are in equilibrium.

Now, suppose the economy is in depression so that there is very high rate of unemployment as well as unused capacity. Consequently, the real output is far below the full-employment level. The price level, in all probability, would be stable, not actually showing a falling trend. The economy, in terms of our Fig.25.1, is at Y_0 level of real output where IS_0 intersects LM_0.

Such a situation - stable price level with high rate of unemployment - cannot be socially acceptable, because stability means not merely price stability but price stability with near-full employment consistent with structural and frictional unemployment. In theory either a monetary policy or a fiscal policy can be employed to correct this situation. Monetary policy implies increasing the stock of money thus increasing real balances in the hands of people. This would increase the aggregate demand directly as well as through lowring the rate of interest. In terms of our Fig.25.1 above, the increase in money stock from m_0 to m_1 shifts down the LM-curve to the position LM_1. But it has no effect on the equilibrium level of output as the IS_0 curve interacts even the LM_1 curve at Y_0 level of output. It is so because due to the liquidity trap the rate of interest is not lowered despite the increase in money supply. This is a pure case of Keynesian liquidity trap. No amount of increase in money supply can change the equilibrium. Hence the monetary policy would be compeletly ineffective in this case.

However, the fiscal policy which, in such a situation, would work by increasing government expenditure or lowering taxes or both and thus having deficit budgets, would shift the IS-curve to the right to a position like IS_1. It is because such a fiscal policy would increase aggregate demand and thus evoke more investment at any given rate of interest. As the result of this shift of IS-curve, equilibrium will shift from Y_0 to Y_1. Thus the fiscal policy would be effective in this case.

If, no the other hand, the economy initially is at Y, level of output, that is, away from the Liquidity - trap, range, though still quite short of the full employment level of Y, both the monetary policy and the fiscal policy would be effective as can be seen in Fig. 25.1. Since IS_2 curve is supposed to be the initial IS- curve in this case and it cuts the initial LM-curve LM_0 at Y_2 level of output, Y_2 represents initial equilibrium. When the supply of money is increased from M_0 to M_1, the LM- curve shift to LM_1 position and intersects IS_2 curve at the higher output level Y_3. Thus, monetary policy is effective. It is effective because in this case the increase in money supply does lower the rate of interest. Which increase investment expenditure in the economy and through its multiplier effect raises the level of output and employment. In the earlier case of liquidity trap, the increase in money supply did not lead to a fall in the rate of interest and thus the monetary policy was not effective.

The fiscal policy too would be effective in this case shifting the IS-curve to a position like IS_3 and shifting the equilibrium output to Y_4.

However, the relative effectiveness of the monetary policy will depend on the elasticity of the IS curve. More elastic is the IS-curve, the more effective will the monetary policy be. But, if IS_3 is inelastic, the monetary policy will be in effective.

In the classical range where LM curves becomes vertical, only the monetary policy is effective while the fiscal policy is completely ineffective. Supposing economy to be in the initial equilibrium position at Y_5 where IS_4 intersects the LM_0 curve, any upward shift of IS curve, say, to a position like IS_5 through a fiscal deficit, will have no effect on the level of output. But increasing the money supply to M, and thus shifting the LM-curve to LM_1 will shift the equilibrium to Y_6. Here only the monetary policy is effective. The complete ineffectiveness of fiscal policy may be due to the "crowding out" effect. Due to the perfectly inelastic LM curve in this classical range, the rate of interest goes up with government expenditure. The LM curve in perfectly inelastic because in the classical theory there is no speculative demand for money. The rise in the rate of interest may choke the privet investment expenditure to cross cancel the effect of the increase in government expenditure. This effect is known as the "crowding out" effect. This explains the ineffectiveness of the fiscal policy under these circumstances. But increase in money supply will lower the rate of interest which, in turn, would stimulatie investment expenditure and through the multiplier effect the level of income would also increase.

In sum the implication of the IS-LM model is that if there is a liquidity trap position, only the fiscal policy will work. If there is a classical situation is which the speculative demand for money is zero, only the monetary policy will work. In the intermediary situation which are likely to occur more often, both the policies will work, but the relative effectiveness of monetry policy in such a situation will depend on the elasticity of the IS-curve. the more elastic is it, the more effective can monetary policy be.

Self Check Exercise-1

Q1.Discuss about IS-LM Model and Alternative Stabilisation Policies.

25.4 Income policy

The monetry and fiscal policies are similar in the sense the both of them seek to stabilise economic activity by acting upon the aggregate demand. How the changes in the aggregate demand that those policies cause effect the specific wage rates and prices is left entirely to the market forces. The market forces may sometime work in such a fashion that what is being done by the demand management of the monetry and the fiscal policies might be undone by the effect of the market forces. For example, when aggregate demand is being increased to reduce the rate of unemployment, it might push up wage rates and prices causing an inflationary situation. Now, if reducing unemployment to an acceptable low rate is accompained by a rate of inflation which is not socially acceptable, the monetary and fiscal policies as instrument of stabilisation will loss their acceptability. It was in the context of such a situation and against theoretical backround of the discussion on the Phillips curves that a new instrument known as the income policy was evolved.

The "income policy" thus refers to the various courses of action which are taken or can be taken in order to hold wage rate and price advances below those that would prevail as the result of the free working of the market forces.

There are two extremes of such courses of action. The weakest courses is "jawboning" or" moral persuction" which consists of the government persuading the trade unions and business not to raise their wage demand and prices. The strongest course would be to introduce a regime of wage rate and price control by the government.Between these two extremes other courses of action such as the use of wage and price guide post in which the government fixes such guidepost on economic considerations and the trade unions and business are persuaded or bargained into accepting such guideposts for determining wage rate increases and rise in price.

It should be obvious that while the monetary and fiscal policies are aimed at controlling the demand side, the income policy is aimed at controlling price level from the cost side.

The rational behind the policy of wage-price guidepost is that when wage rate increase in excess of the increase in productivity, the cost rise and in order to cover this rise in cost, the firm raise their price. The rise in prices which reduce real wage rate might compel the trade unions to demand still higher money wage rates. If they are successful, the price would farther go up, thus setting up a wage price spiral. On the other hand, if wage rates do not rise more than the rise in productivity then the cost will remain also the profit margins of the firm, and, consequently, prices will also remain constant. Wage-price guidepost in an incomes policy are determined according to this basic principal.

There are certain limitations of the income policy on account of which it has not generally proved to be a significantly successful stabilisation policy. Firstly, the policy cannot be successful unless something is done to control the aggregate demand side also. Secondly, if the wage price guidepost are to be genuinely enforce, their implimentation cannot be left to the good sense of the trade unions and the business. A strict enforcement would require a regime of legal wage and price control which creates its own problem. When, for example, specific wage rates and prices are controlled and fixed by low, they would case to perform their primary function, namely to bring about an efficient allocation of resources. Misallocation of resources might cause distortions in the economy which will not allow it to work optimally. As in the case of the monetary and fiscal policies the income policy as a measure for stabilisation has greater chances of success only if it is combined with the and fiscal policies.

Self Check Exercise-2

Q1.What do you know about Income policy?

25.5 Problems of Stabilisation

We have already observed in a preceding lesson that the basic problem of stabilisation arises from the fact that when the policy makers try to stabilise output and employment at full or near-full employment level consistent with structural and frictional unemployment or the natural unemployment rate as Friedman would like to describe it, the price level goes out of hand and might enter upon a course of run-away inflation. On the other hand, if the rate of inflation is sought to be controlled to keep it as low as possible, the level of employment falls and the rate of unemployment is very high. But there are other problems too.

One of the other problems is to pick up an appropriate macro-model in which the current state of the economy requiring correction can fit in, and that is no easy task. However, even if the policy makers are able to choose the appropriate kind of macro-model, the policy makers have still to face the problem of recognising or diagnosing the correct phase of the cyclical fluctuations through which the economy is currently passing; wrong diagnosis may result in wrong remedies which, instead of curing the situation, may further aggregate it. Apart from it, it always takes some time for the specialists to make such a diagnosis which is usually referred to as the recognition lag. If this lag is too long, the situation may worsen still further.

Recognition lag is not the only lag which complicates the problem. There are other lags too. There is a time lag between the formulation of the appropriate policy and its implementation. Due to this lag, the implementation of the policy may take place at the wrong time with the result that its impact may show up at the wrong time which, instead of smoothening out fluctuations, might aggravate them. We have already referred to this problem in the preceding lesson on the fiscal policy. We shall explain these lag problems in some detail in the next section.

However, there is still another problem which has to be solved before an appropriate policy is formulated and implemented. An economic disturbance an inflationary spurt in prices or a substantial fall in output and employment may come about unexpectedly without any prior warning. Before any policy is even tried to be formulated to meet such a situation, the policy makers have first to decide whether they should or should not react to such a distribuance. It is because if this distribuance is purely a transitory phenomenon, there would be no need to react. But if the phenomenon has the potential to persist. a policy reaction has to be thought of. Thus we can say that for the policy makers the first problem is to adjudge whether the economic distrubance is of relatively permanent character of not. If. for example, the aggregate demand falls due to some temporary causes and if the producers know it as such, they would tackle the disturbance by adjusting their inventories, etc., and as the temporary causes that led to this disturbance disappear from the scene, the economy may autonatically recover and move on to the full- employment level. But, if in such a situation, an active 2 stabilisation policy is implemented, it might result in destabilising rather than stabilising the economy. This happens due to the time lag between the initiation of a policy and its effects. The effect of the policy in our above example would show up when the economy has already recovered and is on the expansionary course. This lagged effect would make the economy to overshoot the full-employment target which will require the policy makers to adopt now a restrictive policy which would turn the economy on a downward course towards full employment but perhaps not without some fluctuations on the way. Therefore this is a serious problem for a stabilistation policy. This problem, in fact, is related to what we have described above as the recognition lag.

In fact, the main problems for stabilisation arise from lags, expectations and uncertainty.

Self Check Exercise-3

Q1.Discuss peoblems of stabilization.

25.6 Lags in the Effects of Policy

The lags in the effects of policy can be described by assuming that the given disturbance, say, a fall in aggregate effective demand which pulls down the level of output and employment quite below the full- employment level, has been recognised to be a permanent rather than a temporary phenomenon. There are some steps which must be taken before any action is taken to correct the disturbance. This would certainly involve a time lag before an appropriate policy is chalked out a further time lag would take place between the formulation of the policy and its implementation. The matter would not end there. There would be a further time lag between the implementation of the policy and its effects. Thus we see that the process involves different types of lags on account of which there is a real danger that due to these lags the effects of policy may turn out to be perverse as we explained towards the end of the preceding section.

The time lags to which we referred above are sometimes classified into inside lags and outside lags. An inside lag refers to the time period that elapses before a policy action is actually undertaken. An outside lag, on the other hand, refers to the time period that the policy action takes in order to show its effects; in other words, it is the time that elaspses before a policy action shows its effects on the economy.

25.6.1 Inside Lags : An important inside lag is the recognition lag which refers to the time period that elapses between the occurrence of a disturbance in the economy and the time when the policy makers recognise that action is required. In theory this lag can be negative, if the disturbance could be correctly forecast and appropriate policy, action could, therefore, be considered before the disturbance actually occurs. Not only in theory but in fact also, but that usually happens in the case of regular disturbances which are generally related to change of seasons. For example, in India economic activity suddenly picks up when there is harvest season which would require in increase in money supply in order to meet the increased transaction demand for it. Such a disturbance is correctly foreseen and the appropriate policy to meet it is always there. The Reserve Bank of India, for example, has a regular policy of increasing the money supply in the economy during these busy seasons related to harvesting of crops. But the disturbances which fall in the category of business cycles and which are the real causse of the instability of free-market economies cannot be perfectly predicted, whatever be the sophistication of the econometric model that the policy makers may rely upon. Hence, in the case of really meaningful destabilising disturbances, the cyclical disturbances, the recognition lag is likely to be positive. John Koreken and Robert Solaw have estimated the value of the recognition lag in the case of monetary policy to be abour 5 months. The lag, though, differed in the case of an expansionary policy and a restrictive policy, it being somewhat higher for the latter than the former. The recognition lag for both monetary policy and fiscal policy has been found to be the same.

Two other instances of inside lag are the decision and action lags.

The decision lag refers to the time lag between the recognition of the need for a policy measure and the taking of the appropriate policy decision. This lag is generally shorter in the case of monetary policy which is generally decided by the central monetary authority of a country which is a specialised institution actively concerned with monetary policy formation and implementation. Fiscal policy, especially in democracies, is relatively slow moving on account of administrative, political and legislative problems.

The action lag refers to the time lag between the deciding on a policy measure and its actual execution. This lag too is generally shorter in the case of monetary policy than the fiscal policy for the same reasons as given above in the case of the decision lag.

The over-all inside lag is zero in the case of the automatic or built-in stabilisers that we mentioned in the preceding lesson. That is indeed their major merit. The most important built-in stabilisers is the income tax which is an increasing function of income and therefore has an automatic check on disposable income as well as net profits which determine consumption expenditure and investment expenditure (See again Lesson No. 24. the section on built-in stabilisers).

25.6.2 Outside Lag : As already observed above, outside lag refers to the time lag between the initiation of a policy measure and the showing up of its effects on the economy. It can be easily seen that while the inside lags are discrete lags inasmuch as the policy can have no effect on the economy till it is implemented, the outside lag is generally is distributed lag, because its effects on the economy are distributed over time. We can explain it in the context of monetary policy. Suppose the disturbance appears in the form of falling aggregate effective demand. The monetary policy corrective to such a disturbance is to increase the aggregate effective demand by increasing the supply of money which would be done by the central bank of a country by its open- market operations and/ or variation in the statutory minimum cash reserves requirements of the member banks. The central bank will purchase securities in the open market, the payments for which would find their way into the cash reserves of the member banks who, on the basis of their enlarged cash reserves, would create more credit, Similarly, the cental bank may also lower the statutory minimum cash reserve requirement which would also cause excess cash reserves with the bank who, on that enlarged bse, can create more credit or bank money. The increased money supply will also cause fall in interest rates, in consequence of which both consumption expenditure and investment expenditure will rise and the aggregate effective demand will consequently rise. As the result of it, output and employment will eventually start increasing. It is obvious that the effect of the monetary policy will not the instantaneous. On the other hand, the process has to go through different stages in time at the end of which only the effect begin to show up. Moreover, even when the effects begin to show up they would usually be at the start and will go on gaining momentum as the time passes. This is what is meant by the outside lag being distributed rather than a discrete one.

The 'distributed' nature of the outside lag is of great significance. The important implication of it is that the effects of a policy are delayed, that is, it acts slowly due to this lag. When the policy acts slowly and the impact of it requires time to build up, it would require considerable skill on the part of policy makers and administrators of the policy. if this policy has not to prove counterproductive in its effects. For, as we observed earlier also, if the effects of a policy appear or become strong at the wrong time, such a policy, instead of stabilising, might quite well destabilise the economy so that it overshoots the target of full employment and pushes it into an inflationary process.

The outside lags are usually quite large. The reason is that the time process through which a policy measure has its full impact on the economy involves. more than one functional relation, each one of which is lagged function in real life. Take the above example of monetary policy. There is time lag between the purchase of securities by the central bank in the open market and the increasing of cash reserves of the member banks. There is also a time lag between the increase in the bank's cash reserves and the increase in the supply of bank credit and fall in the rates of interest; the consumption and investment expenditures will also respond to the fall in the interest rates with a time lag. And, finally, the effects of increased aggregate expenditure on the level of output and employment will also show up with a time lag. Thus, rather too many lagged functions are involved in the process on account of which an outside lag tends to be quite large which complicates the stabilisation problem and creates difficulties for the economic policy makers and the economic administrators.

25.6.3 Monetary Versus Fisal Policy Lags : It should be obvious from the above example that the outside lag involved in a monetary policy is rather very large. It is because it works upon the aggregate effective demand indirectly, lengthening the time process that a monetary policy has to go through before its effects on aggregate demand begin to appear. On the other hand, the outside lag in the case of a fiscal policy, particularly if it operates through increase in government expenditure rather than through a decrease in taxes, is small. It is the fiscal policy influences aggregate demand directly, thus shortening the time process and therefore the lag between the implementation of the policy and its effects on aggregate demand.

The above merit of fiscal policy, in terms of the outside over monetary policy might suggest that the former is superior to the latter. But it is not necessarily so, because this advantage of fiscal policy is to be set against its disadvantage in terms of the inside lag. We had explained above while discussing inside lags that the inside lag is generally greater in the case of fiscal policy than in the case of monetary policy.

In view of the above comparative merits of the two types of policies, it would be judicious to combine the two policies and use them as complementary to each other rather than use any one of them to the complete exclusion of the other. This was also the conclusion that we reached on other grounds in the last lesson.

So far we had been discussing difficulties and problems of stabilisation arising from the existence of lags. But they do not exhaust the problems. Problems and difficulties may also arise from the role that expectations play.

Self Check Exercise-4

Q1. Discuss inside lags, outside lags and monetary versus fiscal lags in the effects of Policy.

25.7 The Role of Expectations

Keynes had specially underlined the role of expectations in determining the level of investment expenditure. He believed that while consumption function was, more or less, stable, the investment function was highly unstable. He sought the causes of violent cyclical fluctuations in the volatile nature of the investment expenditure which he explained with reference to the instability of the investment function and this instability of expectations play. In this context he made a distinction between short-term expectations and long-term expectations. As we have already explained in our lesson on the Keynesian theory of investment, he believed the short-term expectations to be more or less stable but the long-term expectations, which, according to him, have no firm basis to be built upon are very unstable. Thus expectations play a pivotal role in determining the expected yield from new investment or the marginal efficiency of investment which is the more potent force determining aggregate effective demand.

The policy implication of the above role of expectations is that the policy makers will have to take into account the way the policy will affect the expectations of the economic agents, otherwise the stabilisation policy chosen and implemented may not turn out to be effective. On the contrary, there is a real danger that a miscalculation regarding expectations may turn a policy intended to be stabilising into an actually destabilising policy.

It is important in view of the above, that the policy makers should know how expectations are actually formulated. The general belief is that the past behaviour of a variable generally influences the expectations about its future value, but Keynes had provided a very useful insight by emphasising that this hypothesis is true in the case of short-term expectations only. In the case of long- term expectations which are the only kind of expectations relevant in determining investment expenditure, there is no scientific basis so that they are determined more by the speculative activity at the stock exchanges than by any other factor.

However, in recent times, there has arisen a new school of economic thought known as the New Classical Economics School or the Rational Expectations School of economic thought. This school assumes economic agents to be rational in their behaviour in the sense that they formulate their expectations not only on the basis of past behaviour of the variables concerned but they also take into account any additional information that they can lay their lands on and that is relevant for predicting or expecting the values of the relevant variables in the future. For example, while forming expectations with regard to the future course of prices, the rational economic agents will, no doubt, consider how they had been changing in the past. But, if, at the same time, a government comes into power with a firm commitment to change the course of prices in a particular direction and if they believe on the information available to them that the government will not play false to this commitment, then the economic agents' expectations will be formulated taking into consideration this additional information also.

The econometric model in the light of which a policy is to be chalked out has to be built upon the basis of all the information that the economic agents use while formulating their expectations. But that is not an easy task. This means inevitable errors in the predictions of the econometric model used to formulated policy. This is very knotty problem and implies that a precise control of economic activity is well high an impossible task.

Moreover, the policy itself may affect expectations. Therefore it is necessary for policy formation that the effects of a given policy action itself on expectations should also be considered. The inter action of policy and expectations is a special feature of the so-called rational expectations approach.

However, despite the emphasis placed by the rational expectations approach on taking into considerations all the information that influences the formulation of expectations in order to build econometric models that can effectively serve as guide for policy making, such a task is so difficult that even in an advanced country like the U.S.A most expectations mechanisms used in the econometric models of the U.S economy assume that expectations affecting consumption and investment expenditures are based entirely on past values.

In conclusion we can say that expectations play a great role indetermining the level of aggregate demand. Secondly, the difficulties of modeling the way expectations are formulated inevitably lead to errors in forecasting the effects of a particular policy measure on the economy. Thirdly, expectations themselves are likely to be influenced by policy measures; therefore failure to take account of the effect of policies on expectations will lead to wrong predictions of the effects of these policies.

Self Check Exercise-5

Q1. What is the role of expectations?

25.8 More on Rules Versus Discretion:

We had made some references to the rules-versus- discretion controversy in the preceding lesson in the context of the fiscal policy. Here we would like to add some important points to what we have already observed.

In the first place, this controversy has a wider context. Basic to this wider context is the question whether we really need an activist policy when we know that there are many imponderables in formulating and implementing an effective stabilisation policy. Will it not be better, if we leave the things to the market forces to work out through the automatic or built-in stabilisers? The answer to such a question by Milton Friedman would be that an activist policy is of no use. Policies that respond to the current or predicted economic disturbances are called activist policies. He would rather recommend that money supply should be made to rise at a fixed constant rate, whatever that rate be, though he has recommended at various rates of money growth of 2 or 4 5 percent. As he observed in his Presidential Address to the American Economic Association, "By setting itself a steady course and keeping to it, the monetary authority could make a major contribution to promoting economic stability." Friedman thus advocates a simple monetary rule in which the monetary authority does not respond to a disturbance in the economy.

In fact, in answering the above questions in a considered manner, a distinction should be made between policy actions taken in response to major disturbances and fine-tuning policy in which policy variables are continually adjusted in response to even small disturbances in the economy. While the latter type of activist policies might be too ambitious and fraught with destabilising consequences, specially due to the lags mentioned in the preceding section, there is hardly a case for arguing that monetary and fiscal policies should not be used even in response to major disturbances. A constracyclical activist use of monetary and fiscal policies is likely to improve the stability of the economy provided that we proceed in this regard with full caution avoiding the various pitfalls already mentioned in the above section.

Thus, assuming the desirability of activist contracyclical monetary and fiscal policies, the further question is whether the monetary and fiscal authorities should conduct their policy measures according to a pre- announced fixed rule describing precisely how their policy variables will be determined in all future situations, or whether they should be allowed to use their discretion in determining the values of the policy variables at different times depending upon the nature and gravity of the disturbance. The former approach represents intervention by fixed rules which is in fact, a sort of once and for all intervention. Having once laid down the formula or rule that, for example, money supply should be made to increase at a constant rate, say, at 2 percent per annum the economic policy maker takes retirement and lets the administrators administer the policy mechanically according to this rule.

But the latter of the two approaches mentioned above implies discretionary monetary and fiscal policies. It does not require much imagination to perceive that letting policy variables change according to a rigid rule like that of Friedman mentioned above cannot be useful, because all disturbances are neither of the same nature nor of equal gravity. Therefore a policy of fixed rules cannot be effective.

However, it should be noted that the rigidity of fixed rules can be overcome to some extent without the use of a discretionary activist policy. This is done by the use of formula flexibility in the monetary and fiscal policies. An example of it is that instead of laying down the rigid rule that the money supply should be increased at a fixed rate of, say, 2 percent per annum, we can lay down the formula that the rate of money growth will be increased by 2 percent per year for every one percent unemployment in excess of, say, 5 percent which is agreed to be the natural unemployment rate. This formula will be expressed algebraically as follows:

$$\frac{\Delta M}{M} = 4.0 + 2\ (\mu\text{-}5.0)$$

where $\frac{\Delta M}{M}$ is the growth rate and μ is unemployment rate is per cent.

In this case the rate of growth of money supply is not fixed but is flexible, though the authorities cannot in this case use their discretion. The money growth rate is positively linked to the rate of unemployment but with a fixed coefficient of 2. If unemployment rate is 6 percent, the rate of growth of money supply would be 6 percent. And if the rate of unemployment is 7 percent, the money supply would be increased by 8 percent. Thus the rate of growth of money supply is not fixed, even though discretion is ruled out. Linking monetary growth to unemployment rate introduces formula flexibility in the policy and thus makes it an activist contracyclical policy without making it a discretionary policy.

As a matter of fact, the issue of rules versus discretion has been clouded by the fact that the advocates of rules have been generally non-activists whose preferred monetary policy rule is a constant growth rate of money rule. This has tended to reduce the rules versus discretion debate essentially to whether an activist policy is desirable or not. Thus the point is generally lost that it is possible to design activist rules like the above rule linking monetary growth to the unemployment rate.

However, taking into consideration that both the economy and our knowledge of it are changing over time, there is no case for fixing rigid policy rules that would bind the hands of the monetary and fiscal authorities for all times. The advantage of fixing rigid policy rules instead of allowing discretion to the monetary and fiscal authorities is that it imparts certainty to the system. On the other hand, a discretionary policy had the advantage of flexibility. Thus there is a trade off between the certainty about future policy that come from rules and the flexibility of the policy makers in responding to disturbances. A proper balance between the two can be struck by devising activist rules and combining them with discretionary policies.

25.9 Budget Deficit and Inflation:

Budget deficit has a strong relation with inflation. We have already seen in the preceding lesson that a budgetary deficit increases the aggregate demand in an economy. A deficit budget implies that government expenditure exceeds government tax revenue. Since aggregate demand equals private consumption expenditure (C) plus private investment expenditure (1) plus government expenditure (G), any increase in G without any change in tax, will add to the aggregate demand, and if the economy is already in the neighbourhood of full employment, it will have the effect of pulling up the prices and thus generating demand-pull inflation. Any increase in G is subject to the regular multiplier effect equaling the reciprocal of the marginal propensity to save. If we take note of the induced investment also, it will be subject to the super-multiplier effect equaling $\frac{1}{s-\beta}$ where s in the marginal propensity to save and is the marginal propensity to invest. The economy being already near the full employment. It will not be possible to increase real output and hence prices would rise creating a situation f demand-pull inflation.

However, there are some qualifications to this general rule. If the economy is in a state of under- employment equilibrium so that there is widespread unemployment and excess productive capacity is available, budget deficit will not result in inflation. It is because increase in aggregate demand would be met by an increase in output or aggregate supply of goods. Since there is widespread unemployment, increased demand for labour will not raise wage rates. Therefore, as Keynes suggested, the supplies would be perfectly elastic. Thus the impact of the budget deficit will be on output and not on prices. Inflation in this situation cannot be caused by a budget deficit.

Moreover, whether a budget deficit causes inflation or not will also depend on how the government meets or finances the deficit in the budget. If the budgetary deficit is finance by borrowing from the public, it may have a "crowding out" effect in the sense that an increase in government expenditure may be matched by a fall in private expenditure, if the public borrowing of the government raises interest rates and thereby reduces the private investment expenditure and may be some consumption expenditure also. If this happens, the aggregate demand (C+1+G) may not increase in spite of the increase in government expenditure (ΔG). And, therefore, inflation may not be caused even when the economy is in a near-full employment state.

But, if the dificit is financed by borrowing from the central bank, it will result in an increased supply of what we have described in our lesson on the supply of money as the high-powered money which is the monetary base. This ultimately ends in a multiple times increase in the aggregate supply of money. This has the effect of increasing the aggregate demand. If the economy is in a near-full employment state aggregate supply of goods cannot be increased. Thus, there will be "too much money chasing too few goods" giving rise to demand-pull inflation.

Self Check Exercise-6

Q1. Discuss budget deficit and Inflation.

25.10 "Crowding Out" and Government Budget Constraint

Crowding out refers to the phenomenon when an expansionary fiscal policy causes interest rates to rise and thereby results in reducing private expenditure particularly the investment expenditure. When there is "crowding out" effect, the multiplier effect is weakened and the increase in income consequent upon a given increase in government expenditure is less than what be indicated by the simple government expenditure multiplier. This can be illustrated with the help of the following diagram.

The position E_0 (r_0, Y_0) where the IS_0 curve intersects the LM curve in Fig. 25.2 above represents initial full equilibrium in the sense that both the product market (represented by the IS_0 curve) and the money market (represented by the LM curve) are in equilibrium. Let us suppose that now there is an increase in expenditure so that the IS, curve shiflts to the position S_1. The new full equilibrium is now in position E_1 (r_1, Y_1). That is, at a higher level of income as well as higher rate of interest. If the rate of interest had not risen, the equilibrium income would have been Y_2. But, the, the money market could not have been in equilibrium. Increase in income leads to increased demand for money. The supply of money being given and constant this increased demand for money raises the rate of interest from r_0 to r_1. As the result of it, private investment expenditure and possibly some consumption expenditure would also fall so that in full equilibrium, the level of income is Y_1 and not Y_2. This is known as the "crowding out" effect which, in terms of our example is Y_1 Y_2.

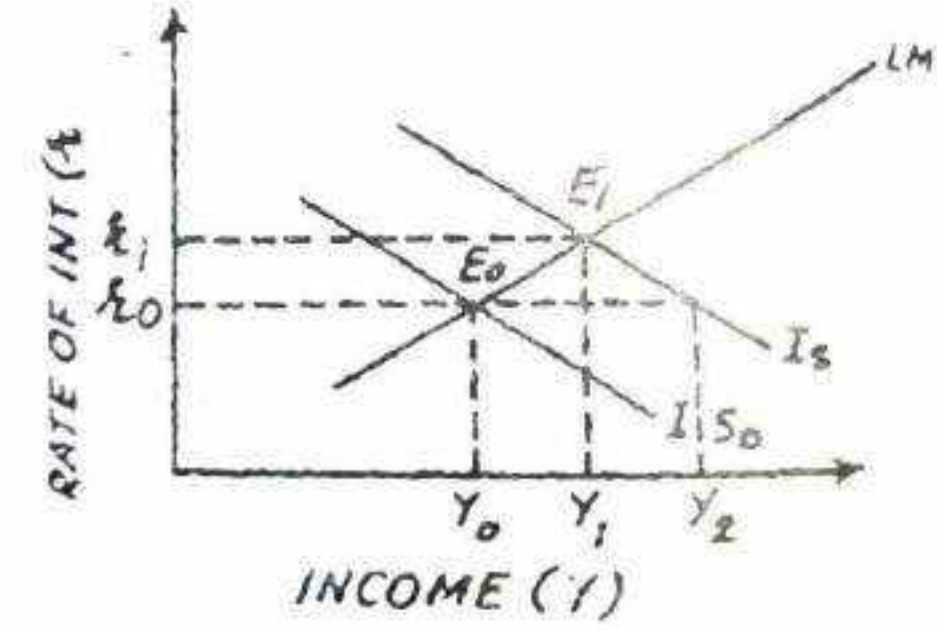


Fig. 25.2

The extent of the "crowding out" effect depends on the relative elasticities of the IS and LM curves and the value of the multiplier. In general, the following relations will hold good:

(1) The more elastic is the LM curve, the less will be the crowding out effect on income, as interest rate will rise proportionately less than income.

(2) The more elastic is the IS curve, the smaller is the crowding out effect.

(3) The larger is the coefficient of the multiplier, the larger is the crowding out effect.

There is zero crowding out effect in the pure Keynesian case of liquidity trap when LM curve is horizontal, because interest rate will not rise. On the other extreme is the pure classical case when the LM curve is vertical. In this case there will be full crowding out as the whole impact would be on the interest rates and no impact on the real income level.

25.10.1 The Government Budget Constraint

The government budget constraint states the truism that the nominal budget deficit of the government can be financed by borrowing either from the central bank or from the private sector or by selling its assets. This government budget constraint may be expressed in the form of the following equation:

$$P.\ BD = \Delta BC + \Delta B_P + \Delta A$$

where BD is budget deficit in real terms; P is the price level; ΔB is the borrowings from the central bank; ΔB_f is borrowing from the private sector; and ΔA is the sales revenue from government assets.

Since the borrowings from the central bank takes the form of additional issue of currency, it represents increase in high powered money (ΔH). Therefore, the above government budget constraint can also be written as follows:-

$$P.\ BD = \Delta H + \Delta B_P + \Delta A$$

The implications of the government budget constraint are as follows. If the budget deficit of the government is financed by borrowing from the private sector, the "crowding out' effect will take place. Its extent will depend on the factors already mentioned above. But if the budget deficit is financed by borrowing from the central bank, this debt of the government will be monetized by an equivalent issue of new currency leading to an increase in high-powered money (ΔH) which, in turn, would increase the total supply of money multiple times the increase in H, depending on the value of the money multiplier. As the result of it, the LM curve will shift down. Consequently, in spite of the budget deficit, the rate of interest may not rise and, hence, there will be no "crowding out" effect.

Self Check Exercise-7

Q1. Discuss crowding out and Government budget constraint.

25.11 Keynesian and Monetarist Perspectives on Monetary and Fiscal Policies

We have already explained the Keynesian and monetarist approaches to monetary and fiscal policies in lessons particularly dealing with these topics. We can, however, recapitulate the essential features of these two approaches.

25.11.1 The Keynesian Perspective : Keynes and his followers were not too hopeful regarding the effectiveness of the monetary policy in influencing the level of output, employment and prices. Their perspective led them to put a much greater reliance on the fiscal policy rather than on the monetary policy.

In the first place, Keynes believed in the indirect mechanism of the working of the monetary policy. According to Keynesians, changes in money stock do not affect the real output or nominal put and employment directly but they do it by first changing the rates of interest which, in turn, affect investment and on sumption expenditures. Secondly, they also believed that monetary policy is completely ineffective during deep depressions when there is liquidity trap and no amount of increase in money stock can lower the rate of interest. Moreover, they also emphasised the role of expectations which are very pessimistic during depressions on account of which the MEC schedule is very low. Due to it also monetary policy is ineffective, even if it is assumed that interest rate can be lowered further. Hence they believed that during depressions monetary policy is not helpful at all and, therefore, fiscal policy which works by directly augmenting the aggregate effective demand through budgetary deficits should be relied upon.

However, even during the other phases of a business cycle, monetary policy, according to Keynesians, is not of much use, because they believed that investment was interest-inelastic. They believed that investment was affected much more by expectation of yields from it, that is, by the marginal efficiency of investment than by changes in the rate of interest. During booms and inflationary situations, increases in the rate of interests might not curb the investment expenditure, if the profitability of investment was pected to be high. Though monetary policy might be relatively more effective in curbing booms and inflations than depressions and deflations, yet it could not be adequately effective even during booms and inflations. Therefore they pleaded for a fiscal policy to be given the leading role, through it could be supplemented with a monetary policy.

It would be wrong to allege as the monetarists usually do that to the Keynesians "money does not mater". Nevertheless, it would not be an exaggeration to state that to the Keynesians money did not matter much. In any case, it did not matter to them as much as the fiscal policy as an instrument of stabilisation. Moreover, even when they did not set a great store by monetary policy, they did not, at the same time, rule it out as an instrument of stabilisation and they tended to assign to it a complementary role.

25.11.2 The Monetarist Perspective: The monetarists, on the other hand, seem to occupy more extremist position regarding monetary and fiscal policies. In the strong version of monetarism, "money alone matters" with the result that they oppose to put sole reliance on the monetary policy as an instrument of stabilisation to the almost exclusion of the fiscal policy.

Monetarists emphasise the importance of the behaviour of money stock in determining not only the rate of inflation in the long run but also the behaviour of real output in the short run. As observed by Friedman himself, "I regard the description of our position as 'money is all that matters for changes in nominal income and for short-run changes in real income' as an exaggeration but one that gives the right flavour of our conclusions". (cf. his "A Theoretical Framework for Monetary Analysis", Journal of Political Economy, March/April, 1970).

In the monetarist perspective, the fluctuations in economic activity can be traced to fluctuations in the rate of monetary growth, from hich the monetarists concluded that monetary policy which was targeted at stabilising the rate of growth of money stock was the only reliable policy for economic stabilisation. Moreover, Friedman and his followers also believed on the basis of empirical studies that the effects of changes in the rate of monetary growth on the subsequent bahaviour of real and nominal output, employment and prices occur with long time-lag which, moreover, is not fixed but variable. From this empirical proposition they deduced the policy conclusion that ruled out the use of an active monetary policy as an instrument of economic stabilisation. In this perspective, an active or discretionary monetary policy, not to speak of an active fiscal policy, might actually destabilise the economy instead of stabilising it, because an action taken now may have its effect on the economy with an uncertain length of lag. It may take a year or two years: It may come about not at the appropriate time. They would, therefore, recommend a regime of rules than that of discretion.

Thus, although the monetarist perspective underlines the effectiveness of monetary policy, yet the monetarists argue against an active use of monetary policy. They, instead, recommend that the money stock should be kept growing at a constant rate.

Moreover, the monetarists give much greater importance to the costs of inflation than to the costs of unemployment as compared to the Keynesians. Therefore they argue against a commitment to maintaining full employment, which, according to them, it sure to set the economy along an inflationary path. Keynesians, on the other hand, had argued for the maintenance of full employment as they gave more importance to the costs of unemployment than to those of inflation.

As opposed to the Keynesians, the monetarists argued that fiscal policy did not have strong effects on the economy except to the extent that it effected the behaviour of money supply. Thus the monetarists assign almost an all powerful role to monetary growth rate.

Lastly, since the monetarists believe that an economy left to itself is more stable than a controlled economy, they argue against all types of discretionary policies, whether monetary or fiscal. Naturally, then as we observed above, the monetarists are against state intervention and with regard to monetary and fiscal policies they argue against discretionary policies and for fixed rules.

Self Check Exercise-8

Q1. Discuss Keynesian and Monetarist on Monetary and Fiscal Policies.

25.12 Summary

The relative effectiveness of Monetary and fiscal policy depends upon the shape of the IS and LM curves and the economy's initial position. If the economy is in the Keynesian range, monetary policy is ineffective and fiscal policy is highly effective. On the other hand, in the classical range, monetary policy is effective and fiscal policy is ineffective. But in the inter mediate range both monetary and fiscal policies are effective. This case bridges the gap between the Keynesian and classical views. In this range the elasticities of IS-LM curves neither highly interest elastic nor highly interest in-elastic. In fact, in the intermediate range the effectiveness of monetary and fiscal policies depends largely on the elasticity of IS curve. If the IS curve is inelastic, fiscal policy is more effective than monetary policy. On the other hand, If the IS curve is elastic, Monetary Policy is more effective than fiscal policy. thus for a complete effectiveness of both monetary and fiscal policies, the best course is to have a monetary-fiscal Mix.

25.13 Glossary

Income Policy emerged after the second world war as an attempt to control Inflation in advanced countries. Monetary fiscal Policies can Lessen the inflationary pressures but at the cost of increasing unemployment among the labour force. These Policies fail to take into account the impact of existing economic structures and institutions on demand pull and cost push inflation. Economists, therefore, advocate an income Policy which is considered as effectives as changing institutions or their structures.

Income Policy has two interrelated objectives, economic growth and control of inflation. The aim is to adopt wage Policies which are closely linked with the Policies relating to income and Prices. By controlling incomes and thereby expenditure on consumption, income Policy aims at maintaining balance between aggregate demand and aggregate supply so as to control inflationary pressures.

25.14 Answers to Self Check Exercises

Self Check exercise -1

Ans.1. Refer to Section 25.3

Self Check exercise -2

Ans.1. Refer to Section 25.4

Self Check exercise -3

Ans.1. Refer to Section 25.5

Self Check exercise -4

Ans.1. Refer to Section 25.6.1,25.6.2 and 25.6.3

Self Check exercise -5

Ans.1. Refer to Section 25.7

Self Check exercise -6

Ans.1. Refer to Section 25.9

Self Check exercise -7

Ans.1. Refer to Section 25.10

Self Check exercise -8

Ans.1. Refer to Section 25.11,25.11.1 and 25.11.2

25.15 References/ SUGGESTED READINGS

1. E. Shapiro : Macroeconomic Analysis, Ch. 24,
2. R. Dombusch and S. Fischer : Macroeconomics, Ch. 5, 12, 14, 17, 18.

25.16 TERMINAL QUESTIONS

1. What is meant by rational expectations approach? What are its implications for stabilisation policy?
2. Explain and examine the Keynesian and monetarist perspectives on monetary and fiscal policies.
3. Write a note on income policy

****