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Tirunelveli – 627 012. Tamil Nadu.

M.A. Economics (First Year)

Macro-Economic Theory and Analysis - I

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Syllabus

Course Objectives:

1. To identify the different concepts of national income.
2. To illustrate the circular flow of income of a country.
3. To analyse the implications of change in policy measures for Business and the economy.

Unit I: National Income and circular flow of Income:

Some Basic Macro Economic Concept - Circular flow of Income in two - three and four sector economy - Different forms of national income accounting - Social accounting - input - output accounting - flow of funds accounting - Balance of payment accounting.

Unit II: Consumption Function:

Keynes psychological law of consumption - implications of the law - Determinants of consumption - Short-run and Long-run consumption Function - Empirical evidence on consumption function - Income - consumption relationship - absolute income, relative income, life cycle and permanent income Hypothesis.

Unit III: Investment Function:

Marginal Efficiency of Capital and Investment - Tobin's Q Theory of Investment.

Unit IV: Theory of Inflation:

Classical, Keynesian, Monetarist approach to inflation - Structuralist theory of Inflation - Philips curve analysis - short-run and long-run Philips cure - Tobin's modified Philips curve - Rational Expectation Hypothesis - policies to control Inflation.

Unit V: Real Business cycle Theory:

Source of productivity shocks in Real business cycle Theory - Stabilisation policy and unemployment - Role of money in Real Business cycle Theory - Policy Implication of real business cycle theory.

Course Outcome:

1. Evaluate the national income accounting.
2. Gain knowledge of theory of inflation.

3. To understand the sectoral flow of income in the country.
4. To evaluate critically on consumption function and investment function.

References:

1. Edward Shapiro - Macroeconomics, Oxford University press.
2. Gregory Mankiw - Macroeconomics, - 6th Edn. Tata McGrawHill.
3. Richard T. Frogmen - Macroeconomics, Pearson Education.
4. Eugene Diutio-Macroeconomic Theory, Schaum's Outline series. Tata McGrawHill.
5. Ahuja, H.L (2007), Macro Economics Theory and Policy - Advanced Analysis, S.Chand & Company Ltd, New Delhi.
6. Mankiw. N Gregory (2000), Macro Economics (Worth Publishers, New York)

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UNIT – I

NATIONAL INCOME AND CIRCULAR FLOW OF INCOME

1.1 Introduction

Macroeconomics is a vast subject and a field of study in itself. However, some quintessential concepts of macroeconomics include the study of national income, gross domestic product (GDP), inflation, unemployment, savings, and investments to name a few. Let's discuss a few concepts.

1.2 Some Basic Macro Economic Concept:

Income and Output:

One of the most important concepts of macroeconomics is income and output. The national output is the total amount of all goods and services produced in a country during a specific period. And when production units or organizations sell everything they produce, they generate an equal amount of income. Hence, you can measure output by calculating the total income from the sale of all goods and services. In relation to macroeconomics and economists usually measure national income or output by gross domestic product or GDP. By measuring GDP, economists can understand the market swings and changes. They can identify what measures to take to improve the GDP of the country. With technological advances, capital increase, and acquisition of state-of-art equipment, production units and organizations can increase national output and income. However, income and output can be affected by the recession and other market factors.

Unemployment

Another important component of macroeconomics is unemployment. Economists measure the unemployment rate in an economy by calculating the percentage of individuals without jobs. Unemployment categories include classic unemployment, frictional unemployment, and structural unemployment. Classical unemployment is when wages are too high for employers to consider hiring more workers. Frictional unemployment occurs when the time taken to search for an appropriate employee is too long. Structural unemployment occurs when there is a mismatch between a worker's skills and the actual skill required for a job. Another important

category of unemployment is cyclical unemployment that occurs when an economy's growth is stagnant.

Inflation and Deflation

The study of inflation and deflation is another important aspect of macroeconomics. The term inflation refers to an increase in the prices of goods and services across the country. And the term deflation refers to a decrease in the prices of goods and services. Economists measure inflation and deflation by studying price indexes. A price index is the weighted average of price for a class of products and services. Inflation occurs when an economy grows too quickly. Deflation, on the other hand, occurs when an economy declines over a period of time. By studying the inflation and deflation trends, economists can help curb inflation rates by taking appropriate measures. Too much inflation can lead to negative consequences and continuous deflation can cause low economic output.

1.3 Circular Income Flow in a Two Sector Economy:

Real flows of resources, goods and services have been shown in Fig. 1.1. In the upper loop of this figure, the resources such as land, capital and entrepreneurial ability flow from households to business firms as indicated by the arrow mark. In opposite direction to this, money flows from business firms to the households as factor payments such as wages, rent, interest and profits.



Fig1.1 Circular Flow of Income and Expenditure

In the lower part of the figure, money flows from households to firms as consumption expenditure made by the households on the goods and

services produced by the firms, while the flow of goods and services is in opposite direction from business firms to households. Thus we see that money flows from business firms to households as factor payments and then it flows from households to firms. Thus there is, in fact, a circular flow of money or income. This circular flow of money will continue indefinitely week by week and year by year. This is how the economy functions. It may, however, be pointed out that this flow of money income will not always remain the same in volume.

In other words, the flow of money income will not always continue at a constant level. In year of depression, the circular flow of money income will contract, i.e., will become lesser in volume, and in years of prosperity it will expand, i.e., will become greater in volume. This is so because the flow of money is a measure of national income and will, therefore, change with changes in the national income. In year of depression, when national income is low, the volume of the flow of money will be small and in years of prosperity when the level of national income is quite high, the flow of money will be large.

In order to make our analysis simple and to explain the central issues involved, we take many assumptions. In the first place, we assume that neither the households save from their incomes, nor the firms save from their profits. We further assume that the government does not play any part in the national economy. In other words, the government does not receive any money from the people by way of taxes, nor does the government spend any money on the goods and services produced by the firms or on the resources and services supplied by the households. Thirdly, we assume that the economy neither imports goods and services, nor exports anything. In other words, in our above analysis we have not taken into account the role of foreign trade. In fact we have explained above the flow of money that occurs in the functioning of a closed economy with no savings and no role of government.

1.4 Circular Income Flow with Saving and Investment:

In our above analysis of the circular flow of income we have assumed that all income which the households receive, they spend it on consumer

goods and services. As a result, circular flow of money spending and income remains undiminished. We will now explain if households save a part of their income, how their savings will affect money flows in the economy. When households save, their expenditure on goods and services will decline to that extent and as a result money flow to the business firms will contract. With reduced money receipts, firms will hire fewer workers (or lay off some workers) or reduce the factor payments they make to the suppliers of factors such as workers.

This will lead to the fall in total incomes of the households. Thus, savings reduce the flow of money expenditure to the business firms and will cause a fall in economy's total income. Economists therefore call savings a leakage from the money expenditure flow. But savings by households need not lead to reduced aggregate spending and income if they find their way back into flow of expenditure. In free market economies there exists a set of institutions such as banks, insurance companies, financial houses, stock markets where households deposit their savings. All these institutions together are called financial institutions or financial market. We assume that all the savings of households come in the financial market. We further assume that there are no inter-households borrowings. It is business firms who borrow from the financial market for investment in capital goods such as machines, factories, tools and instruments, trucks. Firms spend on investment in order to expand their productive capacity in future.

Thus, through investment expenditure by borrowing the savings of the households deposited in financial market, are again brought into the expenditure stream and as a result total flow of spending does not decrease. Circular money flow with saving and investment is illustrated in Fig. 1.2 where in the middle part a box representing financial market is drawn. Money flow of savings is shown from the households towards the financial market. Then flow of investment expenditure is shown as borrowing by business firms from the financial market.

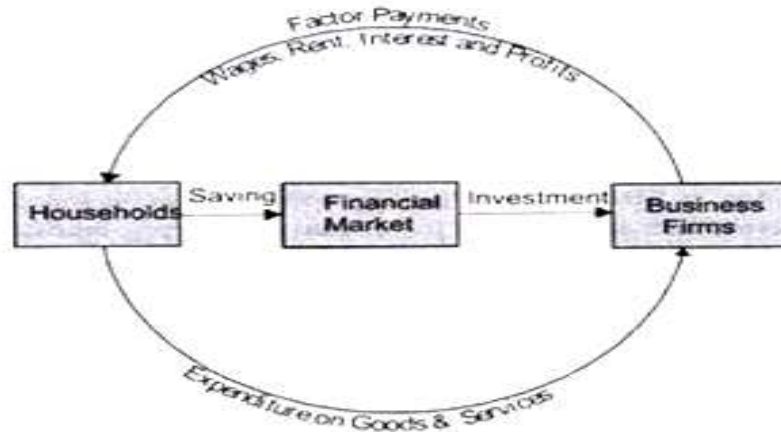


Fig. 1.2 Circular Money Flow with Saving and Investment

Condition for the Constancy of Circular Income Flow:

Now the question arises what is the condition for the flow of money income to continue at a steady level so that it makes possible the production and subsequent flow of a given volume of goods and services at constant prices. To explain this we have to introduce saving and investment in the analysis of circular flow of income. Saving a part of income means it is not spent on consumer goods and services. In other words, saving is withdrawal of some money from the income flow. On the other hand, investment means some money is spent on buying new capital goods to expand production capacity. In other words, investment is injection of some money in circular flow of income.

For the circular flow of income to continue unabated, the withdrawal of money from the income stream by way of saving must equal injection of money by way of investment expenditure. Therefore, planned savings must be equal to planned investment if the constant money income flow in an economy is to be obtained. Now, what will happen if planned investment expenditure falls short of the planned savings? As a result of fall in planned investment expenditure, income, output and employment will fall and therefore the flow of money will contract.

If the equality between planned savings and planned investment is disturbed by increase in savings, then the immediate effect will be that the

stocks of goods lying in the shelves of the shops will increase (as some of the goods will not be sold due to the fall in consumption i.e., increase in savings). Owing to the deficiency of demand for goods and the accumulation of stocks, retailers will place small orders with the wholesalers. Consequently, smaller amount of goods will be produced and therefore fewer capital goods like machinery will be indeed with the result that fixed investment will tend to fall.

Thus the ultimate effect of either the fall in planned investment or the increase in planned savings is the same, namely, the fall in income, output, employment and prices with the result that the flow of money will contract. On the other hand, if the equality between planned savings and planned investment is disturbed by the increase in investment demand, the result will be increase in income, output and employment. Consequently, the flow of money income will expand. It is thus clear from the above analysis that the flow of money income will continue at a constant level only when the condition of equality between planned saving and investment is satisfied. It was believed by classical economists that financial market provides a mechanism which coordinates the savings of households and the investment expenditure, by the firms. Rate of interest, which is the price for the use of savings, is determined by saving and investment. If savings exceed investment expenditure, rate of interest falls so that, at a lower rate of interest, investment increases and both become equal. On the contrary, if investment expenditure is greater than savings, rate of interest will rise so that at a higher rate of interest savings increase and become equal to planned investment expenditure.

However, an eminent British economist J.M. Keynes refuted the above argument that changes in rate of interest will cause saving and investment to become equal. According to him, since in a free market capitalist economy, investment is made by business enterprises and savings are mostly done by households and for different reasons, there is no guarantee that planned investment will be equal to planned savings and thus fluctuations in income, output and employment are inevitable. As a result, circular flow of income does not continue at a steady level in a free-

enterprise capitalist economy unless certain corrective and preventive steps are taken by the government to maintain stability in the economy.

Saving-Investment Identity in National Income Accounts in a Two Sector Economy:

Despite the fact that people who save are different from the business firms which primarily invest, in national income accounts savings are identical or always equal to investment in a simple two sector economy having no roles of Government and foreign trade. This is a basic identity in national income accounts which needs to be carefully understood. Of course, in our above analysis of circular flow of income, we explained that planned investment by business firms can differ from savings by household. But in that analysis we referred to planned or intended investment and savings which often differ and affect the flow of national income. However, in national income accounts we are concerned with actual saving and actual investment. It is these actual or realised saving and investment that are identical in national income accounts. We can prove their identity in the following way.

In a simple economy which has neither government, nor foreign trade, the value of output produced which we denote by Y is equal to the value of output sold. Since the value of output sold in a simple two sector economy is equal to the sum of consumption expenditure and investment expenditure we have $y = C + I$ where Y = Value of aggregate output, C = Consumption expenditure and I = Investment expenditure. A pertinent question which arises here is what happens to the unsold output. The unsold output leads to the increase in the inventories of goods and in national income accounting increase in inventories of goods is treated as a part of actual investment. This may be considered as the firms selling the goods to themselves to add to their inventories. Thus, gross national product (GNP) produced is used either for consumption or for investment.

Now, look at the gross national product or income in the simple economy from the viewpoint of its allocation between consumption and saving. Since national income (which is equal to GNP) can be either consumed or saved.

The left hand side of the identity (iii), namely $C + I = Y$ shows the components of aggregate demand (that is, aggregate expenditure on goods and services produced) and the right-hand side of the identity (iii) namely $Y = C + S$ shows the allocation of national income to either consumption or saving. Thus, the identity (iii) shows that the value of output produced or sold is equal to the total income received. It is income received that is spent on goods and services produced. Now subtracting the consumption (C) from both sides of the identity (iii) we have and $I = S$. Thus, in our two sector simple economy with neither government, nor foreign trade, investment is identically equal to saving.

1.5 Circular Income Flow in a Three Sector Economy with Government:

In our above analysis of money flow, we have ignored the existence of government for the sake of making our circular flow model simple. This is quite unrealistic because government absorbs a good part of the incomes earned by households. Government affects the economy in a number of ways. Here we will concentrate on its taxing, spending and borrowing roles. Government purchases goods and services just as households and firms do. Government expenditure takes many forms including spending on capital goods and infrastructure (highways, power, communication), on defence goods, and on education and public health and so on. These add to the money flows which are shown in Fig. 1.3 where a box representing Government has been drawn. It will be seen that government purchases of goods and services from firms and households are shown as flow of money spending on goods and services.

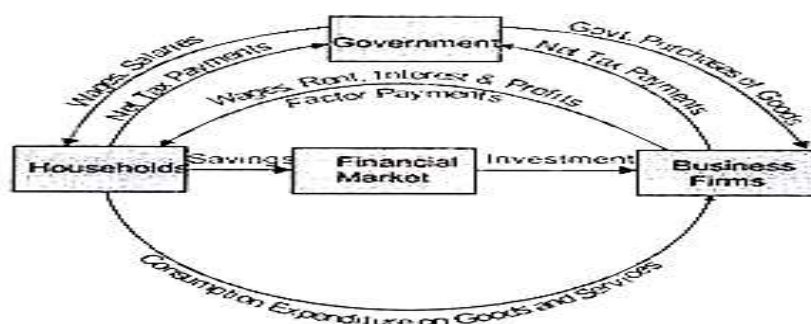


Fig. 1.3 Circular Income Flow Model with Government

Government expenditure may be financed through taxes, out of assets or by borrowing. The money flow from households and business firms to the government is labelled as tax payments in Fig. 1.3 This money flow includes all the tax payments made by households less transfer payments received from the Government. Transfer payments are treated as negative tax payments. Another method of financing Government expenditure is borrowing from the financial market. This can be represented by the money flow from the financial market to the Government and is labelled as Government borrowing (To avoid confusion we have not drawn this money flow from financial market to the Government). Government borrowing increases the demand for credit which causes rate of interest to rise.

The government borrowing through its effect on the rate of interest affects the behaviour of firms and households. Business firms consider the interest rate as cost of borrowing and the rise in the interest rate as a result of borrowing by the Government lowers private investment. However, households who view the rate of interest as return on savings feel encouraged to save more. It follows from above that the inclusion of the Government sector significantly affects the overall economic situation.

Total expenditure flow in the economy is now the sum of consumption expenditure (denoted by C), investment expenditure (I) and Government expenditure (denoted by G). Thus Total expenditure (E) = C + I + G(i), Total income (K) received is allocated to consumption (C), savings (S) and taxes (T). Thus $Y = C + S + T$... (ii), Since expenditure) made must be equal to the income received (Y), from equations (i) and (ii) above we have, $C + I + G = C + S + T$... (iii), Since C occurs on both sides of the equation (iii) and will therefore be cancelled out, we have $I + G = S + T$... (iv), By rearranging we obtain, $G - T = S - I$... (v)

Equation (v) is very significant as it depicts what would be the consequences if government budget is not balanced, that is, if Government expenditure (G) is greater than the tax revenue that is, $G > T$, the government will have a deficit budget. To finance the deficit budget, the Government will borrow from the financial market. For this purpose, then private investment by business firms must be less than the savings of the households. Thus

Government borrowing reduces private investment in the economy. In other words, Government borrowing crowds out private investment.

1.6 Money Income Flows in the Four Sector Open Economy: Adding Foreign Sector:

We now turn to explain the money flows that are generated in an open economy, that is, economy which have trade relations with foreign countries. Thus, the inclusion of the foreign sector will reveal to us the interaction of the domestic economy with foreign countries. Foreigners interact with the domestic firms and households through exports and imports of goods and services as well as through borrowing and lending operations through financial market. Goods and services produced within the domestic territory which are sold to the foreigners are called exports.

On the other hand, purchases of foreign-made goods and services by domestic households are called imports. Figure 1.4 illustrates additional money flows that occur in the open economy when exports and imports also exist in the economy. In our analysis, we assume it is only the business firms of the domestic economy that interact with foreign countries and therefore export and import goods and services.

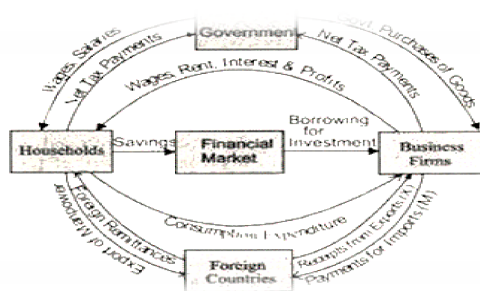


Fig 1.4 circular flow of income in an open economy with government and foreign sector

A flow of money spending on imports has been shown to be occurring from the domestic business firms to the foreign countries (i.e., rest of the world). On the contrary, flow of money expenditure on exports of a domestic economy has been shown to be taking place from foreign countries to the business firms of the domestic economy.

If exports are equal to the imports, then there exists a balance of trade. Generally, exports and imports are not equal to each other. If value of exports exceeds the value of imports, trade surplus occurs. On the other hand if value of imports exceeds value of exports of a country, trade deficit occurs. In the open economy there is interaction between countries not only through exports and imports of goods and services but also through borrowing and lending funds or what is also called financial market. These days' financial markets around the world have become well integrated.

When there is a trade surplus in the economy, that is, when exports (X) exceed imports (M), net capital inflow will take place. By net capital inflow we mean foreigners will borrow from domestic savers to finance their purchases of domestic exports. In this way as a result of net capital inflow domestic savers will lend to foreigners, that is, acquire foreign financial assets. On the contrary, in case of import surplus, that is, when imports are greater than exports, trade deficit will occur. Therefore, in case of trade deficit, domestic consumer households and business firms will borrow from abroad to finance their excess of imports over exports. As a result, foreigners will acquire domestic financial assets. From the circular flows that occur in the open economy the national income must be measured by aggregate expenditure that includes net exports, that is, $X-M$ where X represents exports and M represents imports. Imports must be subtracted from the total expenditure on foreign produced goods and services to get the value of net exports. Thus, in the open economy, $\text{National Income} = C + I + G + NX$ Where NX represents net exports, $X-M$. Since national income can be either consumed, saved or paid as taxes to the Government we have $C + I + G + NX = C + S + T$, The equation shows the equilibrium condition in the circular flow of income and expenditure.

1.7 Different Forms of National Income Accounting:

Meaning:

The term 'social accounting' was first introduced into economics by J.R. Hicks in 1942. In his words, it means 'nothing else but the accounting of the whole community or nation, just as private accounting is the accounting of the individual firm'. Social accounting, also known as national

income accounting, is a method to present statistically the inter-relationships between the different sectors of the economy for a thorough understanding of the economic conditions of the economy. It is a method of studying the structure of the body economic. It is a method of studying the structure of the body economic. It is a technique of presenting information about the nature of the economy with a view not merely to get an idea of its prosperity, past or present, but also to get guidelines for state policy to influence or regulate the economy.

In the words of Edey, Peacock and Cooper: “Social accounting is concerned with the statistical classification of the activities of human beings and human institutions in ways which help us to understand the operation of the economy as a whole. The field of studies summed up by the words ‘social accounting’ embraces, however, not only the classification of economic activity, but also the application of the information thus assembled to the investigation of the operation of the economic system.” In other words, social accounting describes statistically the economic activities of the different sectors of the entire economy, which indicates their mutual relationships and provides a framework for analysis.

1.8 Components of Social Accounting:

The principal forms of economic activity are production, consumption, capital accumulation, government transactions and transactions with the rest of the world. These are the components of social accounting. If the incomings and outgoings of a country relating to these five activities are shown in the form of accounts, they show a closed network of flows representing the basic structure of the economy. These flows are always expressed in money terms. We classify these flows as follows:

(1) Production Account:

The production account relates to the business sector of the economy. It includes all forms of productive activity, i.e., manufacturing, trading, etc. It covers public and private companies, proprietary firms and partnerships, and state-owned business undertakings. Since all productive activity takes place within this sector, all payments flow from it to the other sectors. Payments to personal sector include rent, interest, dividend, wages, salaries,

employees' compensation and proprietors' income. The item 'payments to government' includes producers' net payment to government in the form of taxes and social security payments. Business saving refers to producers' retained income or corporate saving. The last item relates to payments made to the foreign sector for imports of goods and services. These figures make up gross national income. Government purchases refer to goods and services sold by the business sector to the government. Gross private domestic investment comprises the gross flow of capital goods (fixed capital formation) and the net change in inventories. Net exports refer to the income earned by the business sector by selling goods and services to the rest of the world. The total of all these items gives Gross National Product by expenditure.

(2) Consumption Account:

The consumption account refers to the income and expenditure account of the household or personal sector. The household sector includes all consumers and non-profit making institutions such as clubs and associations. The major item in the consumption account is the expenditure of household consumers in buying goods and services from the business sector to satisfy their wants. Payments to government include taxes and special insurance contributions. The next item refers to personal saving used for investment by the household sector. The item 'transfers to foreigners' might be taken to relate to investment in foreign securities or expenses by the residents on education or travel abroad. Consumption account shows income of business and household consumers as the major item which comes in the form of wages and salaries, profit, interest, dividend, rent and receipts from current transfers, etc. Receipts from government include transfer payments and net interest payments on public debt.

(3) Government Account:

The government account relates to the outflows and inflows of the government sector. In the government sector are included all public authorities—centre, states and local authorities in a country. This refers to investment made by the government out of its surplus or saving. However,

the important point to be noted is that state-owned business enterprises are excluded from the government sector as they have been included in the business sector because like private enterprises public undertakings produce goods and services for sale.

(4) Capital Account:

The capital account shows that saving equals domestic and foreign investment. Saving is invested in fixed capital and inventories within the country and/or in international assets. The gross private investment includes the gross flow of capital goods and net change in inventories. Net foreign investment is the foreign surplus on current account.

(5) Foreign Account:

Foreign account shows the transactions of the country with the rest of the world. This account covers international movements of goods and services and transfer payments and corresponds to the current account of the international balance of payments. For simplicity, such services as freight and insurance have not been shown separately. All items have been already explained in the preceding accounts. This is because the amount received by the nationals of the country for exports is paid to foreign countries in exchange for imports and transfer payments. Here payments and receipts relate to the rest of the world and not to the country itself. The five-account system detailed above relates to flows of the economy in terms of production, consumption, government transactions, capital accumulation, and transactions with the rest of the world. The accounts based on them are known as functional accounts, as they are based on a classification of transactions according to their functions.

1.9 Importance of Social Accounting:

Social accounting helps in understanding the structure of an economy and relative importance of the different sectors and flows. It is a key to the evaluation and formulation of government policies both in the present and future. The uses of social accounting are as follows:

(1) In Classifying Transactions:

Economic activity in a country involves innumerable transactions relating to buying and selling, paying and receiving income, exporting and importing, paying taxes, etc. The great merit of social accounting lies in classifying and summarising these different kinds of transactions properly, and deriving from these such aggregates as national income, national expenditure, saving, investment, consumption expenditure, production expenditure, government spending, foreign payments and receipts, etc.

(2) In Understanding Economic Structure:

Social accounting helps us to understand the structure of the body economic. It tells us not only about the national income but also about the size of production and consumption, the level of taxation and saving and the dependence of the economy upon foreign trade.

(3) In Understanding Different Sectors and Flows:

Social accounts throw light on the relative importance of the different sectors and flows in the economy. They tell us whether the contribution of the production sector, the consumption sector, the investment sector or the rest of the world sector is greater than the other sectors in the national accounts.

(4) In Clarifying Relations between Concepts:

Social accounts help in clarifying the relationships between such related concepts as net national product at factor cost and gross national product at market prices.

(5) In Guiding the Investigator:

Social accounts are a guide for the economic investigator by indicating the type of data which might be collected for analysing the behaviour of the economy. Such data might relate to gross national product, government expenditure on goods and services, private consumption expenditure, gross private investment, etc.

(6) In Explaining Trends in Income Distribution:

Variations in the components of social accounts are a guide to the trends in income distribution within the economy.

(7) In Explaining Movements in GNP:

Movements in gross national product valued at constant prices and expressed per head of population indicate changes in the standard of living. Similarly, changes in the level of productivity can be measured by relating gross national product valued at constant prices to working population per head.

(8) Provide a Picture of the Working of Economy:

Social accounts provide an ex post picture of the working of the economy. "They can also be used as a framework for drawing up an ex ante forecast of the likely outcome of the economy in the future. Thus, social accounts ensure consistency of forecasts, both internally and in relation to other known facts."

(9) In Explaining Interdependence of Different Sectors of the Economy:

Social accounts also provide an insight into the interdependence of the different sectors of the economy. This can be known from a study of the matrix of social accounts.

(10) In Estimating Effects of Government Policies:

The importance of social accounts lies in estimating the effects of government policies on different sectors of the economy and in formulating new policies in keeping with changes in economic conditions, as revealed by national income accounts. Their main function is to help the government judge, guide or control economic conditions and to formulate economic policies which aim at maximisation of national income, keeping employment at a high level, reducing inequalities of income and wealth, preventing undue rise in prices, conserving foreign exchange, etc.

(11) Helpful in Big Business Organisations:

Social accounts are also used by big business houses for assessing their performance and to improve their prospects on the basis of the statistical information about the various sectors of the economy.

(12) Useful for International Purposes:

Social accounting is also useful for international purposes. A comparative study of the social accounts of different countries of the world helps in the categorization of countries into underdeveloped, less developed

and developed. It is on the basis of social accounts that the various agencies of the United Nations make provisions for aid to poor countries of the world.

(13) Basis of Economic Models:

Social accounts form the basis for economic models for the purpose of analysing the behaviour of the economy as a whole, of economic forecasting and of illuminating problems of economic policy.

1.10 Difficulties of Social Accounting:

The preparation of social accounts presents the following difficulties:

1. Imputations:

In preparing social accounts, all incomes and payments are measured in money. But there are many goods and services which are difficult to impute in terms of money. They are services of the housewife in her home, painting as hobby by an individual, a teacher teaching his children at home, etc. Similarly there are a number of non-traded or non-marketed products and services. They are vegetables produced in the kitchen garden and consumed by the family itself, rental value of house occupied by the owner himself, a portion of farm produce retained by the farmer for personal consumption, etc. All such non-market transactions which cannot be assessed in money terms present problems in preparing social accounts accurately.

2. Double Counting:

The greatest difficulty in preparing social accounts is of double counting. It arises from the failure to distinguish between final and intermediate products. For instance, flour used by a bakery is an intermediate product and that by a household the final product. Similarly, 'the purchase of a newly constructed building by the government is taken under consumption output of the economy. On the other hand, the purchase of the same building by a private firm becomes gross investment for the year'. Thus the same product is shown as consumption and investment in social accounts. Such problems lead to difficulties in preparing social accounts.

3. Public Services:

Another problem is of estimating a number of public services in social accounts. They are police, military, health, education, etc. Similarly, the contributions made by multipurpose river valley projects cannot be fitted into the social accounts because of the difficulty of assessing their numerous benefits in monetary terms.

4. Inventory Adjustments:

All inventory changes whether negative or positive are adjusted in the production accounts by inventory valuation adjustment. But the difficulty is that firms record inventories at their original costs and not at their replacement costs. When prices rise, there are gains in the book value of inventories. But when prices fall, there are losses in the value of inventories. So for correct calculation of inventories in business accounts under social accounting, inventory valuation adjustment is required which is a very difficult thing.

5. Depreciation:

Another problem in business accounts under social accounting is of estimating depreciation. For instance, it is very difficult to estimate the current depreciation rate of a capital asset whose expected life is very long, say fifty years. The difficulty increases further when prices of assets change every year.

1.11 INPUT OUTPUT ACCOUNTING:

The input-output analysis tells us that there are industrial inter-relationships and inter-dependencies in the economic system as a whole. The inputs of one industry are the outputs of another industry and vice versa, so that ultimately their mutual relationships lead to equilibrium between supply and demand in the economy as a whole. Coal is an input for steel industry and steel is an input for coal industry, though both are the outputs of their respective industries. A major part of economic activity consists in producing intermediate goods (inputs) for further use in producing final goods (outputs).

Input-Output Table:

The input-output accounting of national income is presented in an input-output table which is based on a 'transactions matrix'. A transactions matrix shows how the total output of one industry is distributed to all other industries as inputs and for final demand. A set of $m \times n$ quantities or values arranged in m rows and n columns in a rectangular or square form is a matrix. That is why an input-output table is often called input-output matrix. The columns and rows of an input-output table 'provide industrial breakdowns of the final expenditures and income payments that enter into the national income accounts. A simple input-output matrix of an economy is shown in Table 1.1. Its rows show the amount of each industry's output sold to every other industry and to final buyers. The columns show the amount of each industry's inputs bought from every other industry, and from imports and factor services, known as primary inputs because they are not produced by the industries in the country.

Table 1.1: Input - output transaction matrix

		(Rs Crores)				
Purchasing Total Gross Sectors →	Inputs to			Final Demand (X+K+G+C)	Output	
	Agriculture	Manufacturing	Others			
Selling Sectors ↓	1	2	3	4	5	
Agriculture	-	15	5	22	42	
Manufacturing	12	-	17	16	45	
Others	8	12	-	30	50	
Imports	7	5	8	7	27	
Primary inputs	15	13	20	-	48	
<i>Total Gross Input</i>	42	45	50	75	212	

In

this table, the total gross output of the agriculture sector of the economy is set in the first row (to be read horizontally). It consists of Rs. 15 crores to the manufacturing sector, Rs. 5 crores to the other sectors, and Rs. 22 crores to satisfy the final demand which comprises exports (X), capital (K), government (G) and personal consumption (C). Thus the total gross output of the agriculture sector is Rs. 42 crores = Rs. 20 crores of intermediate

products (Rs. 15 crores plus Rs. 5 crores) + Rs. 22 crores of final demand. Similarly, the second row shows the distribution of total output of the manufacturing sector of the economy valued at Rs. 45 crores per year. Likewise, the other rows show the distribution of output of other sectors, and from imports and primary inputs.

Taking column-wise (to be read downward), the first column shows inputs to the agriculture sector coming from the various sectors of the economy. For instance, inputs worth Rs. 12 crores come from the manufacturing industries, Rs. 8 crores from other sectors, Rs 7 crores from imports and Rs 15 crores from primary inputs. Primary inputs are the sum of payments as wages, profits, etc. and depreciation. They are also called value added. Thus the total gross input of the agriculture sector is $12+8+7+15=Rs. 42$ crores. Similarly, the other columns show inputs to manufacturing and other sectors, and to final demand. The column relating to 'final demand' has been shown as nil against primary inputs. This means that the households of a country simply consume (or spend) but do not sell anything to themselves. For instance, labour is not directly consumed. It may be noted that the row total must equal the column total of the economy in the input-output table. It means that total gross output must equal the total gross input of the economy.

Limitations of Input-Output Accounting Analysis:

Following are the limitations of input-output analysis:

1. Constancy of Input Coefficient Assumption Unrealistic:

The input-output analysis has its shortcomings. Its framework rests on the assumption of constancy of input co-efficient of production. It tells us nothing as to how technical coefficients would change with changed conditions. Again some industries may have identical capital structures some may have heavy capital requirements while others may use no capital. Such variations in the use of techniques of production make the assumption of constant coefficients of production unrealistic.

2. Factor Substitution Possible:

This assumption of fixed coefficients of production ignores the possibility of factor substitution. There is always the possibility of some

substitutions even in a short period, while substitution possibilities are likely to be relatively greater over a longer period.

3. Rigid Model:

The rigidity of the input-output model cannot reflect such phenomena as bottlenecks, increasing costs, etc.

4. Restrictive Model:

The input-output model is severely simplified and restricted as it lays exclusive emphasis on the production side for the economy. It does not tell us why the inputs and outputs are of a particular pattern in the economy.

5. Difficulty in Final Demand:

Another difficulty arises in the case of “final demand” or “bill of goods.” In this analysis, the purchases by the government and consumers are taken as given and treated as a specific bill of goods. Final demand is regarded as an independent variable. It might, therefore, fail to utilize all the factors proportionately or need more than their available supply. Assuming constancy of co-efficiency of production, the analysis is not in a position to solve this difficulty.

6. Quantity of Inputs not Constant:

This analysis operates on the basis of a fixed quantity of an input for the production of per unit of output. As factors are mostly indivisible, the increases in outputs are not expected to be in proportion to the increases in inputs.

7. Solution of Equations Difficult:

The input-output model works on equations which cannot be solved easily. First, the model of equations is prepared and then large numbers of data are collected. Equations require thorough knowledge of higher mathematics and even the collection of data is not so easy. This makes the construction of input-output model difficult.

Importance:

Despite these limitations, the concept of input-output is of tremendous practical value and importance.

- (1) A producer can know from the input-output table, the varieties and quantities of goods which he and the other firms buy and sell to each

other. In this way, he can make the necessary adjustments and thus improve his position vis-a-vis other producers.

- (2) It is also possible to find out from the input-output table the inter-relations among firms and industries about possible trends toward combinations.
- (3) The effects of a prolonged strike, of a war and of a business cycle can be easily perceived from the input-output table.
- (4) The input-output model has come to be used for national income accounting "because it provides a more detailed breakdown of the macro aggregates and money flows."
- (5) The input-output analysis is also used for national economic planning.

The input-output model provides the necessary information about the structural coefficients of the various sectors of the economy during a period of time or at a point of time which can be utilized for the optimum allocation of the economy's resources towards a desired end.

1.12 FLOW OF FUNDS ACCOUNT:

Concept:

The flows of funds accounts were developed by Prof. Morris Copeland' in 1952 to overcome the weaknesses of national income accounting. The flow of funds accounts list the sources of all funds received and the uses to which they are put within the economy. They show the financial transactions among different sectors of the economy and the link between saving and investment aggregates with lending and borrowing by them. The account for each sector reveals all the sources of funds whether from income or borrowing and all the uses to which they are put whether for spending or lending. This way of looking at financial transactions in their entirety has come to be known as the flow of funds approach or of sources and uses of funds.

In the flow of funds accounts, all changes in assets are recorded as uses and all changes in liabilities are recorded as sources. Uses of funds are increases in assets if positive or decreases in assets if negative. They refer to capital expenditures or real investment spending which involve the purchase

of real assets. Sources of funds are increases in liabilities or net worth or saving if positive, and repayment of debt or dissaving if negative. Net worth is equal to a sector's total assets minus its total liabilities. Therefore a change in net worth equals any change in total assets less any change in total liabilities.

Flow of Funds Matrix:

The flow of funds accounting system is presented in the form of a matrix by placing sources and uses of funds statements of different sectors side by side. It is an interlocking self-contained system that reveals financial relationships among all sectors of the economy. For the economy as a whole, total liabilities must equal total financial assets, although for any one sector its liabilities may not equal its financial assets. The consolidated net worth of an economy is consequently identical to the value of its real assets. This implies that saving must equal investment in an economy. Any single sector may save more than it invests or invest more than it saves. But the economy-wise total of saving must equal investment.

For simplicity, we take the flow of funds accounts matrix of an economy divided into four sectors: households, nonfinancial corporations, financial institutions, and the government. These institutional sectors are shown in columns and various types of transactions in rows. First take the columns. The household sector includes non-profit organisations within it. Nonfinancial corporations include savings and loan associations, mutual savings banks, insurance companies, pension funds, mutual funds, etc. The remaining sectors are self-explanatory. The last column showing saving and investment is a measure of domestic saving and investment of all sectors minus the rest of the world.

Importance:

The flow of funds accounts present a comprehensive and systematic analysis of the financial transactions of the economy.

1. The flow of funds accounts is superior to the national income accounts. Even though the latter are fairly comprehensive, yet they do not reveal the financial transactions of the economy which the flow of funds accounts do.

2. They provide a useful framework for studying the behaviour of individual financial institutions of the economy.
3. According to Prof. Goldsmith, they bring “the various financial activities of an economy into explicit statistical relationships with one another and with data on the nonfinancial activities that generate income and production.”
4. They trace the financial flows that interact with and influence the real saving-investment process. They record the various financial transactions underlying saving and investment.
5. They are essential raw materials for any comprehensive analysis of capital market behaviour. They help to identify the role of financial institutions in the generation of income, saving and expenditure, and the influence of economic activity on financial markets.
6. The flow of funds accounts show how the government finances its deficit and surplus budget and acquires financial assets.
7. They also show the results of transactions in government and corporate securities, net increase in deposits and foreign assets in the economy.
8. The flow of funds accounts help in analysing the impact of monetary policies on the economy as to whether they bring stability or instability or economic fluctuations.

Limitations:

The flow of funds accounts are beset with a number of problems which are discussed as under:

1. The flow of funds accounts are more complicated than the national income accounts because they involve the aggregation of a large number of sectors with their very detailed financial transactions.
2. There is the problem of valuation of assets. Many assets, claims and obligations have no fixed value. It, therefore, becomes difficult to have their correct valuation.
3. The problem of inclusion of non-reproducible real assets arises in the flow of funds accounts. Economists have not been able to decide as to

the type of reproducible assets which may be included in flow of funds accounts.

4. Similarly, economists have failed to decide about the inclusion of human wealth in flow of funds accounts.

Despite these problems, the flow of funds accounts supplements the national income accounts and help in understanding social accounts of an economy.

1.13 BALANCE OF PAYMENTS ACCOUNT:

Concept:

The balance of payments of a country is a systematic record of all its economic transactions with the outside world in a given year. It is a statistical record of the character and dimensions of the country's economic relationships with the rest of the world. According to Bo Sodersten, "The balance of payments is merely a way of listing receipts and payments in international transactions for a country."

Structure and Classification:

The balance of payments account of a country is constructed on the principle of double-entry book-keeping. Each transaction is entered on the credit and debit side of the balance sheet. But balance of payments accounting differs from business accounting in one respect. In business accounting, debits (-) are shown on the left side and credits (+) on the right side of the balance sheet. But in balance of payments accounting, the practice is to show credits on the left side and debits on the right side of the balance sheet.

When a payment is received from a foreign country, it is a credit transaction while payment to a foreign country is a debit transaction. The principal items shown on the credit side (+) are exports of goods and services, unrequited (or transfer) receipts in the form of gifts, grants etc. from foreigners, borrowings from abroad, investments by foreigners in the country and official sale of reserve assets including gold to foreign countries and international agencies. The principal items on the debit side (-) include imports of goods and services, transfer (or unrequited) payments to foreigners as gifts, grants, etc., lending to foreign countries, investments by

residents to foreign countries and official purchase of reserve assets or gold from foreign countries and international agencies. These credit and debit items are shown vertically in the balance of payments account of a country according to the principle of double-entry book-keeping. Horizontally, they are divided into three categories: the current account, the capital account and the official settlements account or the official reserve assets account.

1. Current Account:

The current account of a country consists of all transactions relating to trade in goods and services and unilateral (or unrequited) transfers. Service transactions include costs of travel and transportation, insurance, income and payments of foreign investments, etc. Transfer payments relate to gifts, foreign aid, pensions, private remittances, charitable donations, etc. received from foreign individuals and governments to foreigners. In the current account, merchandise exports and imports are the most important items. Exports are shown as a positive item and are calculated f.o.b. (free on board) which means that costs of transportation, insurance, etc. are excluded. On the other side, imports are shown as a negative item and are calculated c.i.f. (costs, insurance and freight) and included.

The difference between exports and imports of a country is its balance of visible trade or merchandise trade or simply balance of trade. If visible exports exceed visible imports, the balance of trade is favourable. In the opposite case when imports exceed exports, it is unfavourable. It is, however, services and transfer payments or invisible items of the current account that reflect the true picture of the balance of payments account. The balance of exports and imports of services and transfer payments is called the balance of invisible trade. The invisible items along with the visible items determine the actual current account position. If exports of goods and services exceed imports of goods and services, the balance of payments is said to be favourable. In the opposite case, it is unfavourable. In the current account, the exports of goods and services and the receipts of transfer payments (unrequited receipts) are entered as credits (+) because they represent receipts from foreigners. On the other hand, the imports of goods and services and grant of transfer payments to foreigners are entered

as debits (-) because they represent payments to foreigners. The net value of these visible and invisible trade balances is the balance on current account.

2. Capital Account:

The capital account of a country consists of its transactions in financial assets in the form of short-term and long-term lending's and borrowings and private and official investments. In other words, the capital account shows international flows of loans and investments, and represents a change in the country's foreign assets and liabilities. Long-term capital transactions relate to international capital movements with maturity of one year or more and include direct investments like building of a foreign plant, portfolio investment like the purchase of foreign bonds and stocks and international loans.

On the other hand, short- term international capital transactions are for a period ranging between three months and less than one year. There are two types of transactions in the capital account—private and government. Private transactions include all types of investment: direct, portfolio and short-term. Government transactions consist of loans to and from foreign official agencies. In the capital account, borrowings from foreign countries and direct investment by foreign countries represent capital inflows. They are positive items or credits because these are receipts from foreigners. On the other hand, lending to foreign countries and direct investments in foreign countries represent capital outflows. They are negative items or debits because they are payments to foreigners. The net value of the balances of short-term and long-term direct and portfolio investments is the balance on capital account. The sum of current account and capital account is known as the basic balance.

3. The Official Settlements Account:

The official settlements account or official reserve assets account is, in fact, a part of the capital account. But the U.K. and U.S. balance of payments accounts show it as a separate account. "The official settlements account measures the change in nations' liquidity and non-liquid liabilities to foreign official holders and the change in a nation's official reserve assets during the year. The official reserve assets of a country include its gold

stock, holdings of its convertible foreign currencies and SDRs, and its net position in the IMF". It shows transactions in a country's net official reserve assets.

4. Errors and Omissions: Errors and omissions is a balancing item so that total credits and debits of the three accounts must equal in accordance with the principles of double entry book-keeping so that the balance of payments of a country always balances in the accounting sense.

Is Balance of Payments Always in Equilibrium?

Balance of payments always balances means that the algebraic sum of the net credit and debit balances of current account, capital account and official settlements account must equal zero. Balance of payments is written as: $B = R_f - P_f$, Where, B represents balance of payments, R_f receipts from foreigners, P_f payments made of foreigners, When $B = R_f - P_f = 0$, the balance of payments is in equilibrium.

When $R - P_f > 0$, it implies receipts from foreigners exceed payments made to foreigners and there is surplus in the balance of payments. On the other hand, when $R_f - P_f < 0$ or $R_f < P_f$ there is deficit in the balance of payments as the payments made to foreigners exceed receipts from foreigners. If net foreign lending and investment abroad are taken, a flexible exchange rate creates an excess of exports over imports. The domestic currency depreciates in terms of other currencies. The exports become cheaper relatively to imports; It can be shown in equation form: $X + B = M + I_f$, Where X represents exports, M imports I. foreign investment, B foreign borrowing, or $X - M = I_f - B$, or $(X - M) - (I_f - B) = 0$, The equation shows the balance of payments in equilibrium. Any positive balance in its current account is exactly offset by negative balance on its capital account and vice versa. In the accounting sense the balance of payments always balances.

This can be shown with the help of the following equation: $C + S + T = C + I + G + (X - M)$, or $Y = C + I + G + (X - M)$ ($Y = C + S + T$), Where C represents consumption expenditure, S domestic saving, T tax receipts, I investment expenditures, G government expenditures, X exports of goods and services and M imports of goods and services. In the above equation $C + S + T$ is GNI or national income (Y), and $C + I + G = A$, Where A is called 'absorption'

In the accounting sense, total domestic expenditures ($C + I + G$) must equal current income ($C + S + T$) that is $A = Y$. Moreover, domestic saving (S_d) must equal domestic investment (I_d). Similarly, an export surplus on current account ($X > M$) must be offset by an excess of domestic saving over investment ($S > I_d$). Thus the balance of payments always balances in the accounting sense, according to the basic principle of accounting. In the accounting system, the inflow and outflow of a transaction are recorded on the credit and debit sides respectively. Therefore, credit and debit sides always balance. If there is a deficit in the current account, it is offset by a matching surplus in the capital account by borrowings from abroad or/and withdrawing out of its gold and foreign exchange reserves, and vice versa. Thus, the balance of payments always balances in this sense also.

UNIT - II
CONSUMPTION FUNCTION

2.1 Introduction:

One of the important tools of the Keynesian economics is the consumption function. This chapter deals with the consumption function, its technical attributes, its importance and its subjective and objective determinants along with Keynesian Psychological Law of Consumption.

2.2 Meaning of consumption function

The consumption function or propensity to consume refers to income-consumption relationship. It is a “functional relationship between two aggregates, i.e., total consumption and gross national income.” Symbolically, the relationship is represented as $C=f(Y)$, where C is consumption, Y is income, and f is the functional relationship. Thus the consumption function indicates a functional relationship between C and Y, where C is the dependent by Y is the independent variable, i.e., C is determined by Y. This relationship is based on the ceteris paribus (other things being equal) assumption, as such only income-consumption relationship is considered and all possible influences on consumption are held constant. In fact, the propensity to consume or consumption function is a schedule of the various amounts of consumption expenditure corresponding to different levels of income. A hypothetical consumption schedule is given in Table 2.1.

Table 2.1: Consumption Schedule

Income (Y)	Consumption C = f (Y)
0	20
60	70
120	120
180	170
240	220
300	270
360	320

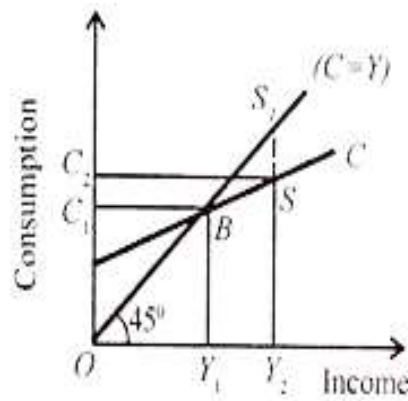


Table 2.1 shows that consumption is an increasing function of income because consumption expenditure increases with increase in income. Here it is shown that when income is zero during the depression, people spend out of their past savings on consumption because they must eat in order to live. When income is generated in the economy to the extent of Rs 60 crores, it is not sufficient to meet the consumption expenditure of the community so that the consumption expenditure of Rs 70 crores is still above the income amounting to Rs 60 crores (Rs 10 crores are dis-saved). When both consumption expenditure and income equal Rs 120 crores, it is the basic consumption level. After this, income is shown to increase by 60 crores and consumption by 50 crores. This implies a stable consumption function during the short-run as assumed by Keynes.

Figure 2.1 illustrates the consumption function diagrammatically. In the diagram, income is measured horizontally and consumption is measured vertically. 45° is the unity-line where at all levels income and consumption are equal. The C curve is a linear consumption function based on the assumption that consumption changes by the same amount (Rs50 crores). Its upward slope to the right indicates that consumption is an increasing function of income. B is the break-even point where $C=Y$ or $OY_1 = OC_1$. When income rises to OY_1 consumption also increases to OC_2 , but the increase in consumption is less than the increase in income, $C_1C_2 < Y_1Y_2$. The portion of income not consumed is saved as shown by the vertical distance between 45° line and C curve, i.e., SS_1 . "Thus the consumption function measures not only the amount spent on consumption but also the

amount saved. This is because the propensity to save is merely the propensity not to consume. The 45° line may therefore be regarded as a zero-saving line, and the shape and position of the C curve indicate the division of income between consumption and saving.”

2.3 Properties of Consumption Function:

The consumption function has two technical attributes or properties:

- (i) The average propensity to consume, and
- (ii) The marginal propensity to consume.

(i) The Average propensity to Consume:

The average propensity to consume may be defined as the ratio of consumption expenditure to any particular level of income.” It is found by dividing consumption expenditure by income, or $APC = C/Y$. It is expressed as the percentage or proportion of income consumed.

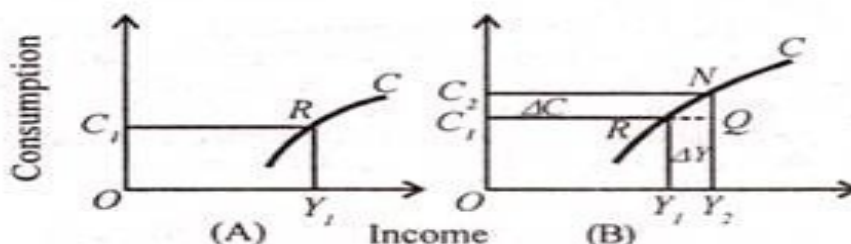


Fig. 2.2 Average Propensity to Consume

The APC at various income levels is shown in column 3 of Table II. The APC declines as income increases because the proportion of income spent on consumption decreases. But reverse is the case with APS (average propensity to save) which increases with increase in income (see column 4). Thus the APC also tells us about the average propensity to save, $APS = 1 - APC$. FIG. 2.2 diagrammatically, the average propensity to consume is any one point on the C curve. In Figure 2.2 Panel (A), point R measures the APC of the C curve which is OC_1/OY_1 . The flattening of the C curve to the right shows declining APC.

(ii) The Marginal Propensity to Consume:

“The marginal propensity to consume may be defined as the ratio of the change in consumption to the change in income or as the rate of change in the average propensity to consume as income changes.” It can be found by dividing change in consumption by a change in income, or $MPC = \Delta C / \Delta Y$. The MPC is constant at all levels of income as shown in column 5 of Table II. It is 0.83 or 83 per cent because the ratio of change in consumption to change in income is $\Delta C / \Delta Y = 50 / 60$. The marginal propensity to save can be derived from the MPC by the formula $1 - MPC$.

2.4 Keynes’s Psychological Law of Consumption:

Keynes propounded the fundamental psychological law of consumption which forms the basis of the consumption function. He wrote, “The fundamental psychological law upon which we are entitled to depend with great confidence both a priori from our knowledge of human nature and from the detailed facts of experience, is that men are disposed as a rule and on the average to increase their consumption as their income increases but not by as much as the increase in their income.” The law implies that there is a tendency on the part of the people to spend on consumption less than the full increment of income.

Propositions of the Law:

This law has three related propositions:

- (1) When income increases, consumption expenditure also increases but by a smaller amount. The reason is that as income increases, our wants are satisfied side by side, so that the need to spend more on consumer goods diminishes. It does not mean that the consumption expenditure falls with the increase in income. In fact, the consumption expenditure increases with increase in income but less than proportionately.
- (2) The increased income will be divided in some proportion between consumption expenditure and saving. This follows from the above proposition because when the whole of increased income is not spent on consumption, the remaining is saved. In this way, consumption and saving move together.

(3) Increase in income always leads to an increase in both consumption and saving. This means that increased income is unlikely to lead either to fall in consumption or saving than before. This is based on the above propositions because as income increases consumption also increases but by a smaller amount than before which leads to an increase in saving.

Thus with increased income both consumption and saving increase. The three propositions of the law can be explained with the help of the following Table 2.2.

Table 2.2: proposition of Law (Rs. crores)

Income (Y)	Consumption (C)	Savings (S = Y-C)
0	20	-20
60	70	-10
120	120	0
180	170	10
240	220	20
300	270	30
360	320	40

Proposition (1):

Income increases by Rs 60 crores and the increase in consumption is by Rs 50 crores. The consumption expenditure is, however, increasing with increase in income, i.e., Rs 170, 220, 270 and 320 crores against Rs 180, 240, 300 and 360 crores respectively.

Proposition (2):

The increased income of Rs 60 crores in each case is divided in some proportion between consumption and saving (i.e., Rs 50 crores and Rs 10 crores).

Proposition (3):

As income increases from Rs 120 to 180, 240, 300 and 360 crores, consumption also increases from Rs 120 to 170, 220, 270, 320 crores, along with increase in saving from Rs 0 to 10, 20, 30 and 40 crores respectively. With increase in income neither consumption nor saving has fallen.

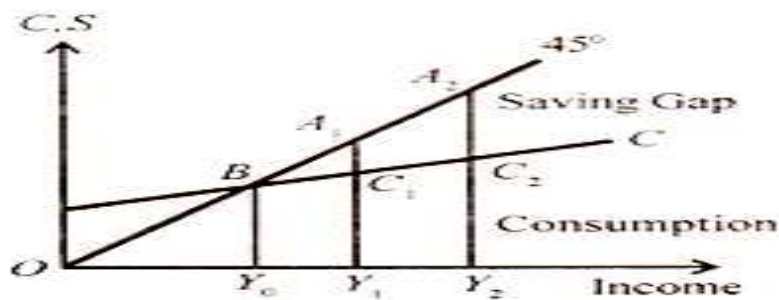


FIG. 2.3: Proposition of law

Diagrammatically, the three propositions are explained in Figure 3. Here, income is measured horizontally and consumption and saving are measured on the vertical axis. C is the consumption function curve and 45° line represents income.

Proposition (1): When income increases from OY_0 to OY_1 consumption also increases from BY_0 to C_1Y_1 but the increase in consumption is less than the increase in income, i.e., $C_1Y_1 < AY_1 (=OY_1)$ by A_1C_1 .

Proposition (2): When income increases to OY_1 and OY_2 it is divided in some proportion between consumption C_1Y_1 and C_2Y_2 and saving A_1C_1 and A_2C_2 respectively.

Proposition (3): Increases in income to OY_1 and OY_2 lead to increased consumption $C_2Y_2 > C_1Y_1$ and increased saving $A_2C_2 > A_1C_1$ than before. It is clear from the widening area below the C curve and saving gap between 45° line and C curve.

2.5 Implications of Keynes Law

Keynes's psychological law has important implications which in fact point towards the importance of the consumption function because the latter is based on the former. The following are its implications:

1. Invalidates Say's Law:

Say's Law states that supply creates its own demand. Therefore, there cannot be general overproduction or general unemployment. Keynes's psychological law invalidates Say's Law because as income increases, consumption also increases but by a smaller amount. In other words, all that is produced (income) is not taken off the market (spent), as income

increases. Thus supply fails to create its own demand. Rather it exceeds demand and leads to general overproduction and glut of commodities in the market. As a result, producers stop production and there is mass unemployment.

2. Need for State Intervention:

As a corollary to the above, the psychological law highlights the need for state intervention. Say's Law is based on the existence of laissez-faire policy and its refutation implies that the economic system is not self-adjusting. So when consumption does not increase by the full increment of income and consequently there is general overproduction and mass unemployment, the necessity of state intervention arises in the economy to avert general overproduction and unemployment through public policy.

3. Crucial Importance of Investment:

Keynes's psychological law stresses the vital point that people fail to spend on consumption the full increment of income. This tendency creates a gap between income and consumption which can only be filled by either increased investment or consumption. If either of them fails to rise, output and employment will inevitably fall. Since the consumption function is stable in the short-run, the gap between income and consumption can only be filled by an increase in investment. Thus the psychological law emphasises the crucial role of investment in Keynes's theory. It is the inadequacy of investment which results in unemployment and logically, the remedy to overcome unemployment is increase in investment.

4. Existence of Underemployment Equilibrium:

Keynes's notion of underemployment equilibrium is also based on the psychological law of consumption. The point of effective demand which determines the equilibrium level of employment is not of full employment but of underemployment because consumers do not spend the full increment of their income on consumption and there remains a deficiency in aggregate demand. Full employment equilibrium level can however, be reached if the state increases investment to match the gap between income and consumption.

5. Declining Tendency of the Marginal Efficiency of Capital:

The psychological law also points towards the tendency of declining marginal efficiency of capital in a laissez-faire economy. When income increases and consumption does not increase to the same extent, there is a fall in demand for consumer goods. This results in glut of commodities in the market. The producers will reduce production which will, in turn, bring a decline in the demand for capital goods and hence in the expected rate of profit and business expectations. It implies a decline in the marginal efficiency of capital. It is not possible to arrest this process of declining tendency of marginal efficiency of capital unless the propensity to consume rises. But such a possibility can exist only in the long run when the psychological law of consumption does not hold good.

6. Danger of Permanent Over-saving or Under-investment Gap:

Keynes's psychological law points out that there is always a danger of an over-saving or under-investment gap appearing in the capitalist economy because as people become rich the gap between income and consumption widens. This long-run tendency of increase in saving and fall in investment is characterised as secular stagnation. When people are rich, their propensity to consume is low and they save more. This implies low demand which leads to decline in investment. Thus the tendency is for secular stagnation in the economy.

7. Unique Nature of Income Propagation:

The higher the MPC, the higher the value of the multiplier, and vice versa. The fact that the entire increased income is not spent on consumption explains the multiplier theory. The multiplier theory or the process of income propagation tells that when an initial injection of investment is made in the economy, it leads to smaller successive increments of income. This is due to the fact that people do not spend their full increment of income on consumption. In fact, the value of multiplier is derived from the marginal propensity to consume, i.e., $\text{Multiplier} = \frac{1}{1 - \text{MPC}}$

2.6 Determinants of Consumption Function

Keynes mentions two principal factors which influence the consumption function and determine its slope and position.

They are (i) the subjective factors and (ii) the objective factors.

The subjective factors are endogenous or internal to the economic system. They include psychological characteristics of human nature, social practices and institutions and social arrangements. They “are unlikely to undergo a material change over a short period of time except in abnormal or revolutionary circumstances.” They, therefore, determine the slope and position of the C curve which is fairly stable in the short-run. The objective factors are exogenous or external to the economic system. They may, therefore, undergo rapid changes and may cause marked shifts in the consumption function (i.e., the C curve).

Subjective Factors in the consumption Function:

Keynes’s subjective factors basically underlie and determine the form (i.e., slope and position) of the consumption function. The subjective factors are the psychological characteristics of human nature, social practices and institutions, especially the behaviour patterns of business concerns with respect to wage and dividend payments and retained earnings, and social arrangements affecting the distribution of income. There are two motives of subjective factors: individual and business.

1. Individual Motives:

First, there are eight motives “which lead individuals to refrain from spending out of their incomes.” They are:

- The desire to build reserves for unforeseen contingencies;
- The desire to provide for anticipated future needs, i.e., old age, sickness, etc.;
- The desire to enjoy and enlarged future income by way of interest and appreciation;
- The desire to enjoy a gradually increasing expenditure in order to improve the standard of living;
- The desire to enjoy a sense of independence and power to do things;

- The desire to secure a “masse de manoeuvre” to carry out speculative or business projects;
- The desire to bequeath a fortune;
- The desire to satisfy a pure miserly instinct.

2. Business Motives:

The subjective factors are also influenced by the behaviour of business corporations and governments. Keynes lists four motives for accumulation on their part:

- Enterprise, the desire to do big things and to expand;
- Liquidity, the desire to meet emergencies and difficulties successfully;
- Income raise the desire to secure large income and to show successful management;
- Financial prudence, the desire to provide adequate financial resources against depreciation and obsolescence, and to discharge debt.

These factors remain constant during the short-run and keep the consumption function stable.

2.7. Objective Factors of the Consumption Function:

1. Changes in the Wage Level:

If the wage rate rises, the consumption function shifts upward. The workers having a high propensity to consume spend more out of their increased income and this tends to shift the C curve upward. If, however, the rise in the wage rate is accompanied by a more than proportionate rise in the price level, the real wage rate will fall and it will tend to shift the C curve downward. A cut in the wage rate will also reduce the consumption function of the community due to a fall in income, employment and output. This will shift the curve downward.

2. Windfall Gains or Losses:

Unexpected changes in the stock market leading to gains or losses tend to shift the consumption function upward or downward. For instance, the phenomenal windfall gains due to the stock-market boom in the American economy after 1925 led to a rise in the consumption spending of the stock-holders by roughly in proportion to the increased income and as a

result the consumption function shifted upward. Similarly, unexpected losses in the stock market lead to the downward shifting of the C curve.

3. Changes in the Fiscal Policy:

Changes in fiscal policy in the form of taxation and public expenditure affect the consumption function. Heavy commodity taxation adversely affects the consumption function by reducing the disposable income of the people. This is what actually happened during the Second World War when the consumption function shifted downward due to heavy indirect taxation, rationing and price controls. On the other hand, the policy of progressive taxation along with that of public expenditure on welfare programmes tends to shift the consumption function upward by altering the distribution of income.

4. Changes in Expectations:

Changes in future expectations also affect the propensity to consume. If a war is expected in the near future, people start hoarding durable and semi-durable commodities in anticipation of future scarcity and rising prices. As a result, people buy much in excess of their current needs and the consumption function shifts upward. On the contrary, if it is expected that prices are likely to fall in the future, people would buy only those things which are very essential. It will lead to a fall in consumption demand and to a downward shift of the consumption function.

5. Changes in the Rate of Interest:

Substantial changes in the market rate of interest may influence the consumption function indirectly. There are several ways in which the rate of interest may affect the consumption function. A rise in rate of interest will lead to a fall in the price of bonds, thereby tending to discourage the propensity to consume of the bond-holders. It may also have the effect of substituting one type of assets for another. People may be encouraged to save rather than invest in bonds. In case they are buying durable consumer goods like refrigerators, scooters, etc. on hire-purchase system they will tend to postpone their purchases when the rate of interest rises. They will have to pay more in instalments and thus their consumption function will shift downward. Keynes wrote, 'Over a long period, substantial changes in the

rate of interest probably tend to modify social habits considerably. Besides, these five factors, Keynes also listed changes in accounting practice with respect to depreciation. This factor has been rejected by Hansen who opines that “it is not a factor which can be thought to change violently in the short-run and it was a mistake for Keynes to include it here.” However, we add some of the other objective factors listed by Keynes’s followers.

6. Financial Policies of Corporations:

Financial policies of corporations with regard to income retention, dividend payments and reinvestments tend to affect the consumption function in several ways. If corporations keep more money in the form of reserves, dividend payments to shareholders will be less, this will have the effect of reducing the income of the shareholders and the consumption function will shift downward.

7. Holding of Liquid Assets:

The amount of liquid assets in the form of cash balances, savings and government bonds in the hands of consumers also influence the consumption function. If people hold larger liquid assets they will have a tendency to spend more out of their current income and the propensity to consume will move upward, and vice versa. Pigou was of the view that with a cut in money wage, prices fall and the real value of such assets increases. This tends to shift the consumption function upward. This is called the “Pigou Effect.”

8. The Distribution of Income:

The distribution of income in the community also determines the shape of the consumption function. If there are large disparities in income distribution between the rich and the poor, the consumption function is low because the rich have a low propensity to consume and the poor with a very low income are unable to spend more on consumption. If through progressive taxation and other fiscal measures, the inequalities of income and wealth are reduced, the consumption function will shift upward because with the increase in the income of the poor their consumption expenditure will increase more than the reduction in the expenditure of the rich. “Moreover, if the distribution of income is significantly altered for

political or humanitarian reasons, consumer habits themselves may undergo such changes as to cause the position or shape of the entire consumption function to vary perceptibly.”

9. Attitude toward Saving:

The consumption function is also influenced by people’s attitude toward saving. If they value future consumption more than present consumption, they will tend to save more and the consumption function will shift downward. This tendency may be reinforced by the state through compulsory life insurance, provident fund and other social insurance schemes to keep the consumption function low. In a high-saving economy, the consumption function is low.

10. Duesenberry Hypothesis:

James Duesenberry has propounded a relative income hypothesis affecting the consumption function. The first part of this hypothesis relates to the ‘demonstration effect.’ There is a tendency in human beings not only to keep up with the Joneses but also to surpass the Joneses, that is, the tendency is to strive constantly toward a higher consumption level and to emulate the consumption patterns of one’s rich neighbours and even to surpass them. Thus consumption preferences are interdependent. The second part is the ‘past peak of income’ hypothesis which explains the short-run fluctuations in consumption. Once the community reaches a particular income level and standard of living, it is reluctant to come down to a lower level of consumption during a recession.

Consumption is sustained by the reduction in current saving and vice versa. So there is no shift in the consumption function during the short-run. There is simply an upward-downward movement on the same consumption function when income rises or falls during the short- run. We may conclude with Professor Hansen “that except for quite abnormal or revolutionary changes in certain objective factors...shifts in the ‘propensity to consume out of a given income’ are not likely to be of more than secondary importance.”

2.8 Theory of the consumption function:

Absolute Income Hypothesis:

Keynes in his General Theory postulated that aggregate consumption is a function of aggregate current disposable income. The relation between consumption and income is based on his Fundamental Psychological Law of Consumption which states that when income increases consumption expenditure also increases but by a smaller amount. $C = a + cY$ $a > 0$, $0 < c < 1$, Where a is the intercept, a constant which measures consumption at a zero level of disposal income; c is the marginal propensity to consume (MPC); and Y is the disposal income. The above relation that consumption is a function of current disposable income whether linear or non-linear is called the absolute income hypothesis.

This consumption function has the following properties:

1. As income increases, average propensity to consume ($APC = C/Y$) falls.
2. The marginal propensity to consume (MPC) is positive but less than unity ($0 < c < 1$) so that higher income leads to higher consumption.
3. The consumption expenditure increases (or decreases) with increase (or decrease) in income but non-proportionally. This non-proportional consumption function implies that in the short-run average and marginal propensities do not coincide ($APC > MPC$).
4. This consumption function is stable both in the short-run and the long-run.

This consumption function is explained in Fig. 1 where $C = a + cY$ is the consumption function. At point E on the C curve the income level is OY_1 . At this point, $APC > MPC$ where $APC = OC_1/OY_1$ and $MPC = \Delta C/\Delta K = ER/RE_0$. This shows disproportional consumption function. The intercept a shows the level of consumption corresponding to a zero level of income. At income level OY_0 , where the curve C intersects the 45° line, point E_0 represents $APC (=OC_0 / OY_0)$. Below the income level consumption is more than income. In this range, $APC > 1$. Above the income level OY_0 , consumption increases less than proportionately with income so that APC declines and it is less than one.

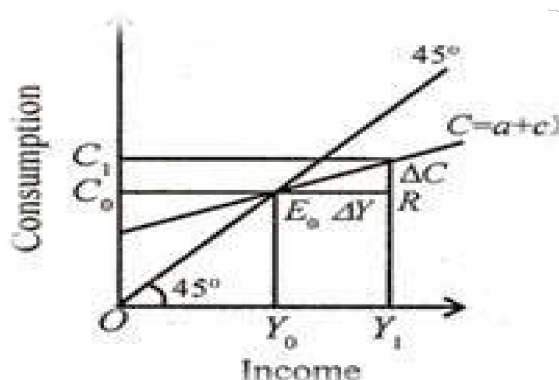


Fig. 2.3 Absolute income hypothesis

Empirical Studies:

Keynes put forth this hypothesis on the basis of “knowledge of human nature” ‘and “derailed facts of experience”. His followers in a number of empirical studies based on cross-section budget figures and short-run time series data in the late 1930s and mid-1940s confirmed his hypothesis. They found that families with higher income levels consumed more which confirms that MPC is greater than zero ($c > 0$), but by less than the increase in income ($c < 1$). They also found that families with higher income levels saved more and so consumed a smaller proportion of income which confirms that APC falls as income rises.

The Consumption Puzzle:

Keynes’ assertion that the APC falls as income rises led some Keynesians to formulate the secular stagnation thesis around 1940. According to these economists, as incomes grew in the economy, households would save more and consume less. As a result, aggregate demand would fall short of output. If the government spending was not increased at a faster rate than income, the economy would lapse into stagnation. But after World War II, the American economy experienced inflation rather than stagnation even when the government expenditures were reduced below 1941 level in constant dollars. The Keynesian consumption function had been proved wrong. This was due to the conversion of government bonds into liquid assets after the War by the households in order to meet their pent up demand for consumer goods. In 1946, Kuznets studied the consumption

and income data for the United States during the period 1869-1938 and estimated the consumption function for this period as 0.9.' Further, he arrived at two conclusions: one, over the long-run, on the average, the APC did not show any downward trend so that the MPC equalled the APC as income increased along a long-run trend.

This means that the consumption function is a straight line through the origin, as shown by the C_L line in Fig. 2.4, and two, the years in which the APC was below the long-run average were boom periods, and the years in which the APC was above the long-run average were of slump periods. This implies that in the short-run as income changes over the business cycle, the MPC is less than the APC, as shown by the C_S curve in Fig. 2.4.

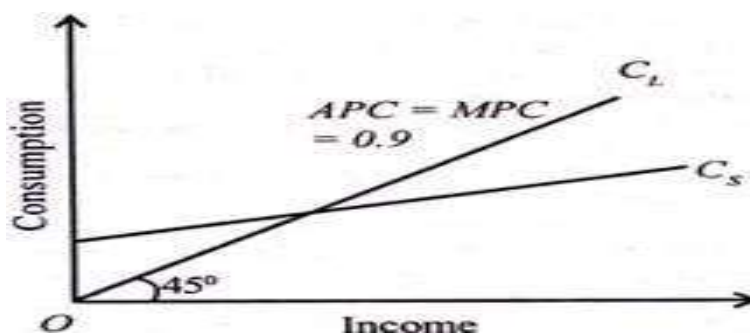


Fig. 2.4 consumption puzzle

These findings were later verified by Goldsmith in 1955 who found the long-run consumption function to be stable at 0.87. Thus these two studies revealed that for the short-run time series, the consumption function is non-proportional because $APC > MPC$ and for the long-run time series, the consumption function is proportional, $APC = MPC$. The failure of the secular stagnation hypothesis and the findings of Kuznets and Goldsmith were a puzzle to the economists which is known as the consumption puzzle. Figure 2.4 illustrates this puzzle where there are two consumption functions. C_S is the Keynesian consumption function which is non-proportional ($APC > MPC$) and based on the short-run time series data. C_L is the long-run proportional consumption function ($APC = MPC$) based on long-run time series data. Over the years, economists have been engaged in solving this puzzle by reconciling the two consumption functions. We study below a few important theories which try to reconcile the two consumption functions.

2.9 The Drift Theory of Consumption:

One of the first attempts to reconcile the short-run and long-run consumption functions was by Arthur Smithies and James Tobin. They tested Keynes' absolute income hypothesis in separate studies and came to the conclusion that the short-run relationship between consumption and income is non- proportional but the time series data show the long-run relationship to be proportional. The latter consumption-income behaviour results through an upward shift or "drift" in the short- run non-proportional consumption function due to factors other than income.

Smithies and Tobin discuss the following factors:

1. Asset Holdings:

Tobin introduced asset holdings in the budget studies of Negro and white families to test this hypothesis. He came to the conclusion that the increase in the asset holdings of families tends to increase their propensity to consume thereby leading to an upward shift in their consumption function.

2. New Products:

Since the end of the Second World War, a variety of new household consumer goods have come into existence at a rapid rate. The introduction of new products tends to shift the consumption function upward.

3. Urbanisation:

Since the post-War period, there has been an increased tendency toward urbanisation. This movement of population from rural to urban areas has tended to shift the consumption function upward because the propensity to consume of the urban wage earners is higher than that of the farm workers.

4. Age Distribution:

There has been a continuous increase in the percentage of old people in the total population over the long-run. Though the old people do not earn but they do consume commodities. Consequently, the increase in their numbers has tended to shift the consumption function upward.

5. Decline in Saving Motive:

The growth of social security system which makes automatic saving and guarantees income during illness. Unemployment disability and old age has increased the propensity to consume.

6. Consumer Credit:

The increasing availability and convenience of short-term consumer credit shifts the consumption function upward. The greater ease of buying consumer goods with credit cards, debit cards, use of ATMs and cheques, and availability of instalment buying causes an upward shift in the consumption function.

7. Expectation of Income Increasing:

Average real wages of workers have increased and they expect them to rise in the future. These cause an upward shift in the consumption function. Those who expect higher future earnings tend to reduce their savings or even borrow to increase their present consumption. The consumption drift theory is explained in Fig. 2.5,

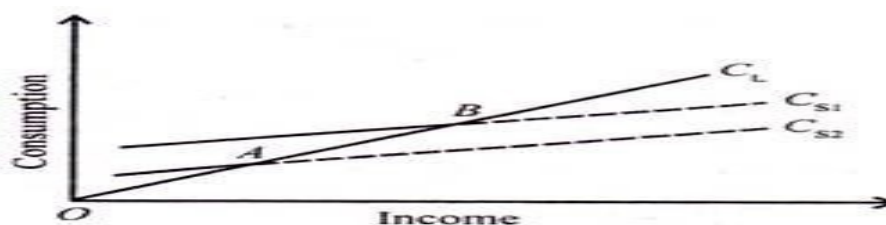


Fig. 2.5 consumption drift theory

Where C_L is the long-run consumption function which shows the proportional relationship between consumption and income as we move along it. C_{S1} and C_{S2} are the short-run consumption functions which cut the long-run consumption function C_L at points A and B. But due to the factors mentioned above, they tend to “drift” upward from point A to point B along the C_L curve. Each point such as A and B on the C_L curve represents an average of all the values of factors included in the corresponding short-run functions, C_{S1} and C_{S2} respectively and the long-run function, C_L , connecting all the average values. But the movement along the dotted portion of the

short-run consumption functions, C_{S1} and C_{S2} , would cause consumption not to increase in proportion to the increase in income.

Criticisms:

The great merit of this theory is that it lays stress on factors other than in income which affect the consumer behaviour. In this sense, it represents a major advance in the theory of the consumption function. However, it has its shortcomings.

1. The theory does not tell the rate of upward drift along the C_L curve. It appears to be a matter of chance.
2. It is just a coincidence if the factors explained above cause the consumption function to increase proportionately with increase in income so that the average of the values in the short-run consumption function equals a fixed proportion of income.
3. According to Duesenberry, all the factors mentioned as causes of the upward shift are not likely to have sufficient force to change the consumption-savings relationship to such an extent as to cause the drift.
4. Duesenberry also points out that many of the factors such as decline in saving motive would lead to a secular fall in the consumption function.

Such saving plans as life insurance and pension programs tend to increase savings and decrease the consumption function. Moreover, people want more supplementary savings to meet post-retirement needs which tend to decrease their current consumption.

2.10 Relative Income Hypothesis:

The relative income hypothesis of James Duesenberry is based on the rejection of the two fundamental assumptions of the consumption theory of Keynes. Duesenberry states that:

1. (1) Every individual's consumption behaviour is not independent but interdependent of the behaviour of every other individual, and
2. (2) That consumption relations are irreversible and not reversible in time.
3. In formulating his theory of the consumption function.

Duesenberry writes: “A real understanding of the problem of consumer behaviour must begin with a full recognition of the social character of consumption patterns.” By the “social character of consumption patterns” he means the tendency in human beings not only “to keep up with the Joneses” but also to surpass the Joneses. Joneses refers to rich neighbours. In other words, the tendency is to strive constantly toward a higher consumption level and to emulate the consumption patterns of one’s rich neighbours and associates. Thus consumers’ preferences are interdependent. It is, however, differences in relative incomes that determine the consumption expenditures in a community. A rich person will have a lower APC because he will need a smaller portion of his income to maintain his consumption pattern. On the other hand, a relatively poor man will have a higher APC because he tries to keep up with the consumption standards of his neighbours or associates.

This provides the explanation of the constancy of the long-run APC because lower and higher APCs would balance out in the aggregate. Thus even if the absolute size of income in a country increases, the APC for the economy as a whole at the higher absolute level of income would be constant. But when income decreases, consumption does not fall in the same proportion because of the Ratchet Effect.

2.11 The Ratchet Effect:

The second part of the Duesenberry theory is the “past peak of income” hypothesis which explains the short-run fluctuations in the consumption function and refutes the Keynesian assumption that consumption relations are reversible. The hypothesis states that during a period of prosperity, consumption will increase and gradually adjust itself to a higher level. Once people reach a particular peak income level and become accustomed to this standard of living, they are not prepared to reduce their consumption pattern during a recession. As income falls, consumption declines but proportionately less than the decrease in income because the consumer dissaves to sustain consumption. On the other hand, when income increases during the recovery period, consumption rises gradually with a rapid increase in saving. Economists call this the Ratchet Effect.

Duesenberry combines his two related hypothesis in the following form:

$C_t/Y_t = a + c Y_t/Y_0$, Where C and Y are consumption and income respectively, t refers to the current period and the subscript (o) refers to the previous peak, a is a constant relating to the positive autonomous consumption and c is the consumption function. In this equation, the consumption-income ratio in the current period (C_t/Y_t) is regarded as function of Y_t/Y_0 , that is, the ratio of current income to the previous peak income. If this ratio is constant, as in periods of steadily rising income, the current consumption income ratio is constant. During recession when current income (Y_t) falls below the previous peak income (Y_0), the current consumption income ratio (C_t/Y_t) will increase.

The relative income hypothesis is explained graphically in Fig. 2.6 where C_L is the long-run consumption function and C_{S1} and C_{S2} are the short-run consumption functions. Suppose income is at the peak level of OY_1 where E_1Y_1 is consumption. Now income falls to OY_0 . Since people are used to the standard of living at the OY_1 level of income, they will not reduce their consumption to E_0Y_0 level, but reduce it as little as possible by reducing their current saving. Thus they move backward along the C_{S1} curve to point C_1 and be at C_1Y_0 level of consumption. When the period of recovery starts, income rises to the previous peak level of OY_1 . But consumption increases slowly from C_1 to E_1 along the C_{S1} curve because consumers will just restore their previous level of savings. If income continues to increase to OY_2 level, consumers will move upward along the C_L curve from E_1 to E_2 on the new short-run consumption function C_{S2} .

If another recession occurs at OY_2 level of income, consumption will decline along the C_{S2} consumption function toward C_2 point and income will be reduced to OY_1 level. But during recovery over the long-run, consumption will rise along the steeper C_L path till it reaches the short-run consumption function C_{S2} . This is because when income increases beyond its present level OY_1 , the APC becomes constant over the long-run. The short-run consumption function shifts upward from C_{S1} to C_{S2} but consumers move along the C_L curve from E_1 to E_2 . But when income falls, consumers move backward from E_2 to C_2 on the C_{S2} curve. These upward and downward

movements from C_1 and C_2 points along the C_L curve give the appearance of a ratchet. This is the ratchet effect. The short-run consumption function ratchets upward when income increases in the long run but it does not shift down to the earlier level when income declines. Thus the ratchet effect will develop whenever there is a cyclical decline or recovery in income.

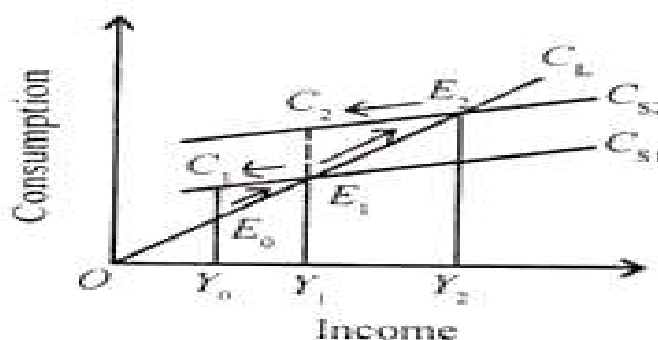


Fig. 2.6 Ratchet Effect

Criticisms:

Although the Duesenberry theory reconciles the apparent contradictions between budget studies and short-term and long-term time series studies, yet it is not without its deficiencies.

1. No Proportional Increase in Consumption:

The relative income hypothesis assumes a proportional increase in income and consumption. But increases in income along the full employment level do not always lead to proportional increases in the consumption.

2. No Direct Relation between Consumption and Income:

This hypothesis assumes the relation between consumption and income to be direct. But this has not been borne out by experience. Recessions do not always lead to decline in consumption, as was the case during the recessions of 1948-49 and 1974-75.

3. Distribution of Income not Unchanged:

This theory is based on the assumption that the distribution of income remains almost unchanged with the change in the aggregate level of income. If with increases in income, redistribution occurs towards greater equality, the APC of all persons belonging to the relatively poor and relatively

rich families will tend to be reduced. Thus the consumption function will not shift upward from C_{S1} to C_{S2} when income increases.

4. Reversible Consumer Behaviour:

According to Micheal Evants, “The consumer behaviour is slowly reversible over time, instead of being truly irreversible. Then previous peak income would have less effect on current consumption, the greater the elapsed time from the last peak.” Even if we know how a consumer spent his previous peak income, it is not possible to know how he would spend it now.

5. Neglects Other Factors:

This hypothesis is based on the assumption that changes in consumer’s expenditure are related to his previous peak income. The theory is weak in that it neglects other factors that influence consumer spending such as asset holdings, urbanisation, changes in age-composition, the appearance of new consumer goods, etc.

6. Consumer Preferences do not depend on others:

Another unrealistic assumption of the theory is that consumer preferences are interdependent whereby a consumer’s expenditure is related to the consumption patterns of his rich neighbour. But this may not always be true. George Katona’s empirical study has revealed that expectations and attitudes play an important role in consumer spending. According to him, income expectations based on levels of aspirations and the attitudes toward asset holdings affect consumer spending behaviour more than the demonstration effect.

7. Reverse Lightning Bolt Effect:

Smith and Jackson have criticised Duesenbery’s empirical evidence that the recovery in income after recession is not caused by ratchet effect. Rather, the consumption experience of consumer is similar to the reverse lightning bolt effect. That is why the consumer gradually increases his consumption due to his inconsistent habit stability with the increase in his income after recession. This is shown in Fig.2.7 where the levels of consumption with the increments in income have been shown by arrows as reverse lightning bolt takes place.

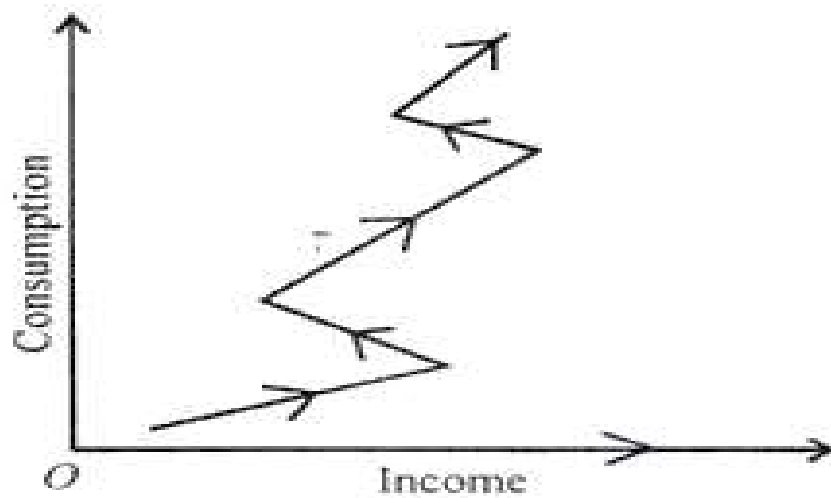


Fig. 2.7 Duesenbery Effect

2.10 Permanent Income Hypothesis:

Another solution to the apparent contradiction between the proportional long-run and non-proportional short-run consumption function is Friedman's permanent income hypothesis. Friedman rejects the use of "current income" as the determinant of consumption expenditure and instead divides both consumption and income into "permanent" and "transitory" components, so that, $Y = Y_p + Y_t$... (1), And $C = C_p + C_t$... (2) Where p refers to permanent, t refers to transitory, Y to income and C to consumption. Permanent income is defined as "the amount a consumer unit could consume (or believes that it could) while maintaining its wealth intact." It is the main income of a family unit which in turn depends on its time-horizon and farsightedness.

Y being the consumer's measured income or current income, it can be larger or smaller than his permanent income in any period. Such differences between measured and permanent income are due to the transitory component of income (Y_t). Transitory income may rise or fall with windfall gains or losses and cyclical variations. If the transitory income is positive due to a windfall gain, the measured income will rise above the permanent income. If the transitory income is negative due to theft, the measured income falls below the permanent income. The transitory income can also be zero in which case measured income equals permanent income.

Permanent consumption is defined as “the value of the services that it is planned to consume during the period in question.” Measured consumption is also divided into permanent consumption (C_p) and transitory consumption (C_t). Measured consumption (or current consumption) may deviate from or equal permanent consumption depending on whether the transitory consumption is positive, negative or zero, Permanent consumption (C_p) is a multiple (k) of permanent income, Y_p .

$$C_p = kY_p$$

$$k = f(r, w, u)$$

$$\text{Therefore, } C_p = k(r, w, u) Y_p \dots (3)$$

Where k is a function of the rate of interest (r), the ratio of property and non-property income to total wealth or national wealth, and the consumer’s propensity to consume (u). This equation tells that over the long period consumption increases in proportion to the change in Y_p . This is attributable to a constant k ($=C_p/Y_p$) which is independent of the size of income. Thus k is the permanent and average propensity to consume and $APC = MPC$.

Friedman analyses the offsetting forces which lead to this result. To take the rate of interest (r), there has been a secular decline in it since the 1920s. This tends to raise the value of k . But there has been a long-run decline in the ratio of property and non-property income to national wealth (w) which tends to reduce the value of k . The propensity to consume has been influenced by three factors. First, there has been a sharp decline in the farm population which has tended to increase consumption with urbanisation. This has led to increase of k . Second, there has been a sharp decline in the size of families. It has led to increase in saving and reduction in consumption thereby reducing the value of k . Third, larger provision by the state for social security. This has reduced the need for keeping more in savings. It has increased the tendency to consume more resulting in the rise in the value of k . The overall effect of these off-setting forces is to raise consumption in proportion to the change in the permanent income component.

Therefore, there is a proportional relation between permanent income and consumption, $C_p = kY_p \dots$ (4), Where k is the coefficient of proportionality in which APC and MPC are endogenous and it depends upon the above mentioned factors. In other words, it is that proportion of fixed income which is consumed. Now take permanent income which is based on time series. Friedman believes that permanent income depends partly on current income and partly on previous period's income. This can be measured as, $Y_{pt} = aY_t + (1-a) Y_{t-1} \dots$ (5), Where Y_{pt} = permanent income in the current period, Y_t = current income in the current period, Y_{t-1} = previous period's income, a – ratio of change in income between current period (t) and previous period (t-1). This equation tells that permanent income is the sum of current period's income (Y_t) and previous periods income (Y_{t-1}) and the ratio of income change between the two (a). If the current income increases at once, there will be small increase in permanent income.

For the permanent income to increase, income will have to be raised continuously for many years. Then only people will think that it has increased. By integrating equations (4) and (5), short-run and long-run consumption function can be explained as, $C_t = kY_{pt} = kaY_t + k(1-a) Y_{t-1} \dots$ (6), Where C_t = current period consumption, ka = short-run MPC, k = long-run MPC and $k(1-a) Y_{t-1}$, is the intercept of short-run consumption function. According to Friedman, k and ka are different from one another and $k > ka$. Further, $k = 1$ and $ka = 0$. Equation (6) tells that consumption depends both on previous income and current income. Previous income is important for consumption because it helps in forecasting the future income of people.

Assumptions:

Given these, Friedman gives a series of assumptions concerning the relationships between permanent and transitory components of income and consumption.

1. There is no correlation between transitory income and permanent income.
2. There is no correlation between permanent and transitory consumption.

3. There is no correlation between transitory consumption and transitory income.
4. Only differences in permanent income affect consumption systematically.
5. It is assumed that individual estimates of permanent income are based on backward looking of expectations.

Explanation of the Theory:

These assumptions give the explanation of the cross-section results of Friedman's theory that the short-run consumption function is linear and non-proportional, i.e., $APC > MPC$ and the long-run consumption function is linear and proportional, i.e., $APC = MPC$. Figure 2.8 explains the permanent income hypothesis of Friedman where C_L is the long-run consumption function which represents the long-run proportional relationship between consumption and income of an individual where $APC = MPC$. C_s is the non-proportional short-run consumption function where measured income includes both permanent and transitory components. At OY income level where C_s and C_L curves coincide at point E , permanent income and measured income are identical and so are permanent and measured consumption as shown by YE . At point E , the transitory factors are non-existent.

If the consumer's income increases to OY_1 he will increase his consumption consistent with the rise in his income. For this, he will move along the C_s curve to E_2 where his measured income in the short-run is OY_1 and measured consumption is Y_1E_2 . The reason for this movement from E to E_2 is that during the short-run the consumer does not expect the rise in income to be permanent, so APC falls as income increases. But if the OY_1 income level becomes permanent, the consumer will also increase his consumption permanently. Now his short-run consumption function will shift upward from C_s to C_{s1} and intersect the long-run consumption function C_L at point E_1 . Thus the consumer will consume Y_1E_1 at OY_1 income level. Since he knows that the increase in his income OY_1 is permanent, he will adjust his consumption Y_1E_1 accordingly on the long-run consumption function C_L at E_1 where $APC = MPC$.

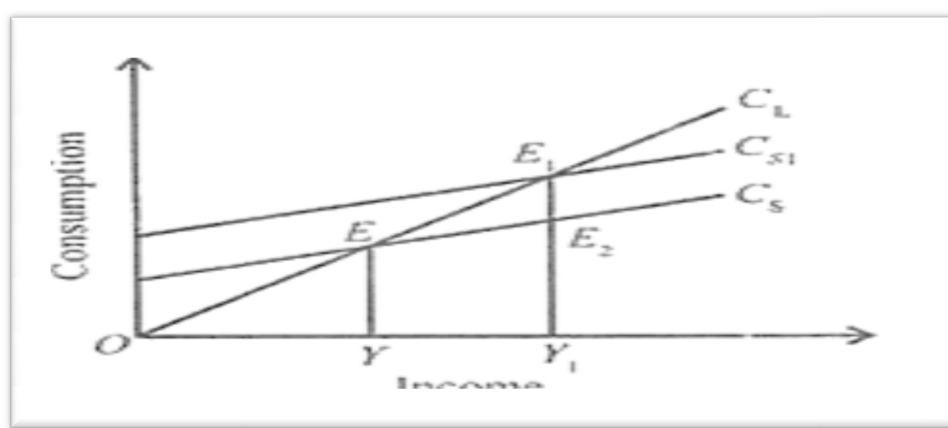


Fig. 2.8 permanent Income Hypothesis

Criticisms:

This theory has been criticised on the following counts:

1. Correlation between Temporary Income and Consumption:

Friedman's assumption that there is no correlation between transitory components of consumption and income is unrealistic. This assumption implies that with the increase or decrease in the measured income of the household, there is neither any increase nor decrease in his consumption, because he either saves or dissaves accordingly. But this is contrary to actual consumer behaviour.

2. APC of all Income Groups not Equal:

Friedman's hypothesis states that the APC of all families, whether rich or poor, is the same in the long-run. But this is against the ordinary observed behaviour of households. It is an established fact that low-income families do not have the capacities to save the same fraction of their incomes as the high income families. This is not only due to their meagre incomes but their tendency to prefer present consumption to future consumption in order to meet their unfulfilled wants. Therefore, the consumption of low-income families is higher relative to their incomes while the saving of high-income families is higher relative to their incomes. Even in the case of persons at the same level of permanent income, the level of saving differs and so does consumption.

3. Use of Various terms Confusing:

Friedman's use of the terms "permanent", "transitory", and "measured" have tended to confuse the theory. The concept of measured

income improperly mixes together permanent and transitory income on the one hand, and permanent and transitory consumption on the other.

4. No Distinction between Human and Non-human Wealth:

Another weakness of the permanent income hypothesis is that Friedman does not make any distinction between human and non-human wealth and includes income from both in a single term in the empirical analysis of his theory.

5. Expectations not Backward-Looking:

Estimates of permanent income are based on forward looking expectations and not on backward-looking expectations. In fact, expectations are rational because changes in consumption are due to unanticipated changes in income that lead to changes in permanent income.

Conclusion:

Despite these weaknesses, “it can be fairly said”, according to Micheal Evans, “that the evidence supports this theory and that Friedman’s formulation has reshaped and redirected much of the research on the consumption function.”

2.11 The Life Cycle Hypothesis:

Ando and Modigliani have formulated a consumption function which is known as the Life Cycle Hypothesis. According to this hypothesis, consumption is a function of lifetime expected income of the consumer. The consumption of the individual consumer depends on the resources available to him, the rate of return on capital, the spending plan, and the age at which the plan is made. The present value of his resources includes income from assets or wealth or property and from current and expected labour income. Thus his total resources consist of his income and wealth.

Assumptions:

The life cycle hypothesis is based on the following assumptions:

- There is no change in the price level during the life of the consumer.
- The rate of interest paid on assets is zero.
- The consumer does not inherit any assets and his net assets are the result of his own savings.
- His current savings result in future consumption.

- He intends to consume his total lifetime earnings plus current assets.
- He does not plan any bequests.
- There is certainty about his present and future flow of income.
- The consumer has a definite conscious vision of life expectancy.
- He is aware of the future emergencies, opportunities and social pressures which will impinge upon his consumption spending.
- The consumer is rational.

Explanation of the Theory: Given these assumptions, the aim of the consumer is to maximise his utility over his lifetime which will, in turn, depend on the total resources available to him during his lifetime. Given the life-span of an individual, his consumption is proportional to these resources. But the proportion of resources that the consumer plans to spend will depend on whether the spending plan is formulated during the early or later year of his life. As a rule, an individual's average income is relatively low at the beginning of his life and also at the end of his life.

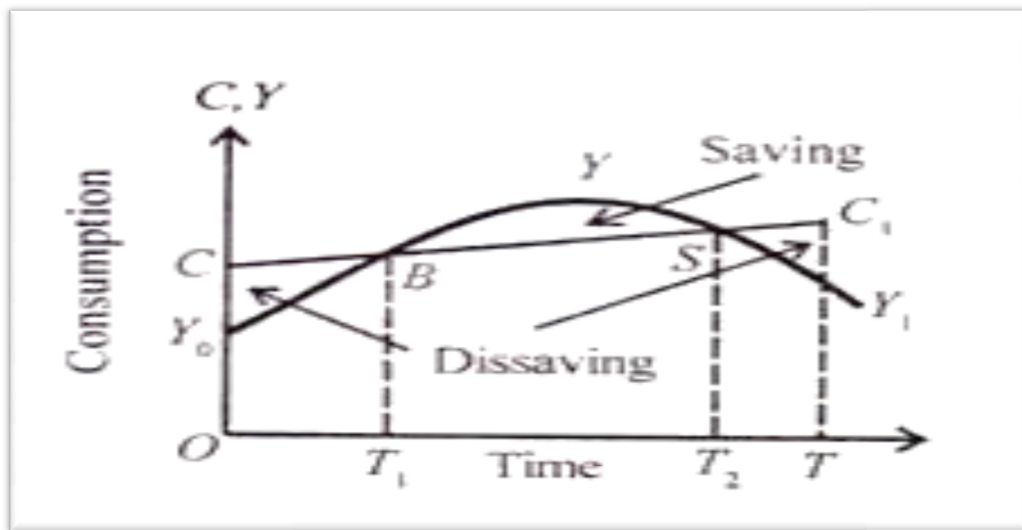


Fig. 2.9 Life cycle Hypothesis

This is because in the early years of his life, he has little assets (wealth) and during the late years, his labour-income is low. It is, however, in the middle of his life that his income, both from assets and labour, is high. As a result, the consumption level of the individual throughout his life is somewhat constant or slightly increasing, shown as the CC_1 curve in Fig.

2.9, the Y_0YY_1 curve shows the individual consumer's income stream during his lifetime. During the early period of his life represented by T_1 in the figure, he borrows or dissaves CY_0B amount of money to keep his consumption level CB which is almost constant. In the middle years of his life represented by T_1T_2 , he saves BSY amount to repay his debt and for the future. In the last years of his life represented by T_2T_1 he dissaves SC_1T_1 amount. According to this theory, consumption is a function of lifetime expected income of the consumer which depends on his resources. In some resources, his current income (Y_t); present value of his future expected labour income ($Y^{e_{Lt}}$) and present value of assets (A_t) are included.

The consumption function can be expressed as:

$C_t = f(V_t) \dots$ (1) Where $V_t =$ total resources at time t . $V_t = f(Y_t + Y^{e_{Lt}} + A_t)$... (2), By substituting equation (2) in (1) and making (2) linear and weighted average of different income groups, the aggregate consumption function is, $C_t = \alpha_1 Y_t + \alpha_2 Y^{e_L} + \alpha_3 A_t \dots$ (3), Where $\alpha_1 =$ MPC of current income, $\alpha_2 =$ MPC of expected labour income; and $\alpha_3 =$ MPC of assets or wealth. Now APC is, $C_t / Y_t = \alpha_1 + \alpha_2 Y^{e_L} / Y_t + \alpha_3 A_t / Y_t$, APC is constant in the long-run because a portion of labour income in current income and the ratio of total assets to current income are constant when the economy grows. On the basis of the life cycle hypothesis, Ando and Modigliani made a number of studies in order to formulate the short-run and long-run consumption functions.

A cross-section study revealed that more persons in the low-income groups were at low income level because they were at the end period of their lives. Thus their APC was high. On the other hand, more than average person's belonging to the high-income groups were at high income levels because they were in the middle years of their lives. Thus their APC was relatively low. On the whole, the APC was falling as income rose thereby showing $APC > MPC$. The observed data for the U.S. revealed the APC to be constant at 0.7 over the long-run. The Ando-Modigliani short-run consumption function is shown by the C_s curve in Fig. 2.10. At any given point of time, the C_s curve can be considered as a constant and during short-run income fluctuation, when wealth remains fairly constant, it looks

like the Keynesian consumption function. But its intercept will change as a result of accumulation of wealth (assets) through savings.

As wealth increases overtime, the non-proportional short-run consumption function C_s shifts upward to C_{s1} to trace out the long-run proportional consumption function. The long-run consumption function is C_L , showing a constant APC as income grows along the trend. It is a straight line passing through the origin. The APC is constant over time because the share of labour income in total income and the ratio of wealth (assets) to total income are constant as the economy grows along the trend.

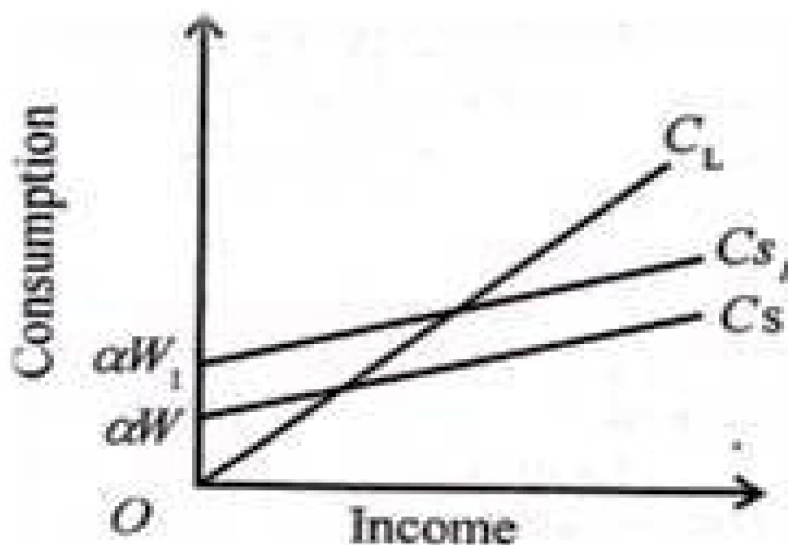


Fig. 2.10 short run consumption function

Implications:

1. The life cycle hypothesis solves the consumption puzzle. According to this hypothesis, the short-run consumption function would be non-proportional as in the short-run time series estimates. Its intercept (αW in Fig. 8) measures the effect of wealth and the life cycle consumption function looks like the Keynesian consumption function as C_s in the figure. But it holds only in the short run when wealth is constant. As wealth grows (αW_1), this consumption function shifts upward as C_{s1} . The shifting of the C_s to C_{s1} traces out the long-run consumption function, C_L . This is consistent with the evidence from long-run time series data that the long-run consumption function is proportional. The

slope of the C_L curve shows that the average propensity to consume does not fall as income increases.

2. The life cycle hypothesis reveals that savings change over the life time of a consumer. If a consumer starts his life in adulthood with no wealth, he will save and accumulate wealth during his working years. But during retirement, he will dissave and run down his wealth. Thus the life cycle hypothesis implies that the consumer wants smooth and uninterrupted consumption over his lifetime. During working years, he saves and when retires, he dissaves.
3. The life cycle hypothesis also implies that a high-income family consumes a smaller proportion of his income than a low-income family. But in the case of a low-income family and a retiree family, the APC is high.

Criticisms:

The life cycle hypothesis is not free from certain criticisms.

1. Plan for Lifetime Consumption Unrealistic:

The contention of Audo and Modigliani that a consumer plans his consumption over his lifetime is unrealistic because a consumer concentrates more on the present rather than on the future which is uncertain.

2. Consumption not directly related to Assets:

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 unwarranted because an individual may reduce his consumption to have larger assets.

3. Consumption depends on Attitude:

Consumption depends upon one's attitude towards life. Given the same income and assets, one person may consume more than the other.

4. Consumer not Rational and Knowledgeable:

This hypothesis assumes that the consumer is rational and has full knowledge about his income and future lifetime. This is unrealistic because no consumer is fully rational and knowledgeable.

5. Estimation of Variables not Possible:

This theory depends on many variables such as current income, value of assets, future expected labour income, etc., and the estimation of so many variables is very difficult and not possible.

6. Liquidity Constraints:

This hypothesis fails to recognise the existence of liquidity constraints for a consumer. Even if he possesses a definite and conscious vision of future income, he may have little opportunity for borrowing in the capital market on the basis of expected future income. As a result, consumption may respond more to changes in current income than predicted on the basis of the life cycle hypothesis.

7. Neglects Locked-up Savings:

This theory neglects the role of locked-up savings in consumption. It regards savings as a pool from which people spend on consumption over their lifetime. In fact, people keep their savings in locked-up form in mutual funds, pension plans, life insurance etc.

Conclusion:

Despite these, the life cycle hypothesis is superior to the other hypotheses on consumption function because it includes not only wealth as a variable in the consumption function but also explains why $APC > MPC$ in the short-run and APC is constant in the long-run.

UNIT III

INVESTMENT FUNCTION

3.1. Meaning of Capital and Investment:

Investment means to buy shares, stocks, bonds and securities which already exist in stock market. But this is not real investment because it is simply a transfer of existing assets. Hence this is called financial investment which does not affect aggregate spending. In Keynesian terminology, investment refers to real investment which adds to capital equipment. It leads to increase in level of income and production by increasing the production and purchase of capital goods. Investment thus includes new plant and equipment, construction of public works like dams, roads, buildings etc., net foreign investment, inventories, and stocks and shares of new companies.

Capital, on the other hand, refers to real assets like factories, plants, equipment and inventories of finished and semi-finished goods. It is any previously produced input that can be used in the production process to produce other goods. The amount of capital available in an economy is the stock of capital. Thus capital is a stock concept. To be more precise, investment is the production or acquisition of real capital assets during any period of time. To illustrate, suppose the capital assets of a firm on 31 March 2004 are Rs 100 crores and it invests at the rate of Rs 10 crores during the year 2004-05. At the end of the next year (31 March 2005), its total capital will be Rs 110 crores. Symbolically, let I be investment and K be capital in year t , then $I_t = K_t - K_{t-1}$.

Capital and investment are related to each other through net investment. Gross investment is the total amount spent on new capital assets in a year. But some capital stock wears out every year and is used up for depreciation and obsolescence. Net investment is gross investment minus depreciation and obsolescence charges for replacement investment. This is the net addition to the existing capital stock of the economy. If gross investment equals depreciation, net investment is zero and there is no addition to the economy's capital stock. If gross investment is less than depreciation, there is disinvestment in the economy and the capital stock

decreases. Thus for an increase in the real capital stock of the economy, gross investment must exceed depreciation, i.e., there should be net investment.

3.2. Types of Investment:

- Induced Investment
- Autonomous Investment

1. Induced Investment:

Real investment may be induced. Induced investment is profit or income motivated. Factors like prices, wages and interest changes which affect profits influence induced investment. Similarly demand also influences it. When income increases, consumption demand also increases and to meet this, investment increases. In the ultimate analysis, induced investment is a function of income i.e., $I = f(Y)$. It is income elastic. It increases or decreases with the rise or fall in income, as shown in Figure 3.1

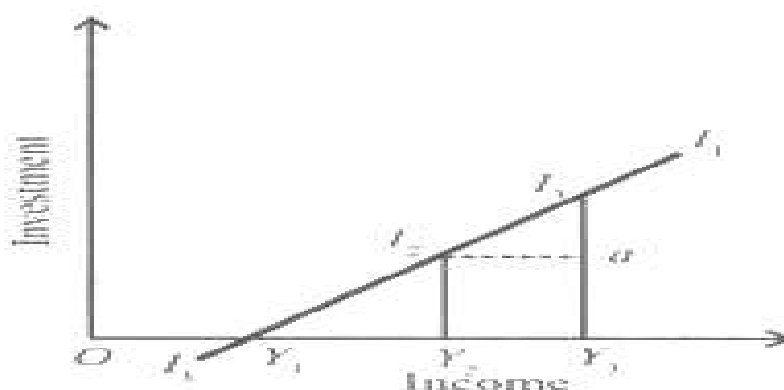


Fig. 3.1 Induced Investments

$I_1 I_1$ is the investment curve which shows induced investment at various levels of income. Induced investment is zero at OY_1 income. When income rises to OY_3 induced investment is I_3Y_3 . A fall in income to OY_2 also reduces induced investment to I_2Y_2 .

Induced investment may be further divided into

- (i) the average propensity to invest, and
- (ii) the marginal propensity to invest:

(i) **The average propensity to invest** is the ratio of investment to income, I/Y . If the income is Rs. 40 crores and investment is Rs. 4 crores, $I/Y = 4/40$

= 0.1. In terms of the above figure, the average propensity to invest at OY_3 income level is I_3Y_3 / OY_3 .

(ii) **The marginal propensity to invest** is the ratio of change in investment to the change in income, i.e., If the change in investment, $\Delta I = \text{Rs } 2$ crores and the change in income, $\Delta Y = \text{Rs } 10$ crores, then $\Delta I / \Delta Y = 2/10 = 0.2$ In Figure 3.1, $\Delta I / \Delta Y = I_3a / Y_2Y_3$.

2. Autonomous Investment:

Autonomous investment is independent of the level of income and is thus income inelastic. It is influenced by exogenous factors like innovations, inventions, growth of population and labour force, researches, social and legal institutions, weather changes, war, revolution, etc. But it is not influenced by changes in demand. Rather, it influences the demand. Investment in economic and social overheads whether made by the government or the private enterprise is autonomous. Such investment includes expenditure on building, dams, roads, canals, schools, hospitals, etc. Since investment on these projects is generally associated with public policy, autonomous investment is regarded as public investment. In the long-run, private investment of all types may be autonomous because it is influenced by exogenous factors. Diagrammatically, autonomous investment is shown as a curve parallel to the horizontal axis as I_1I_1' curve in Figure 3.2. It indicates that at all levels of income, the amount of investment OI_1 remains constant. The upward shift of the curve to I_2I_2' indicates an increased steady flow of investment at a constant rate OI_2 at various levels of income. However, for purposes of income determination, the autonomous investment curve is superimposed on the C curve in a 45° line diagram.

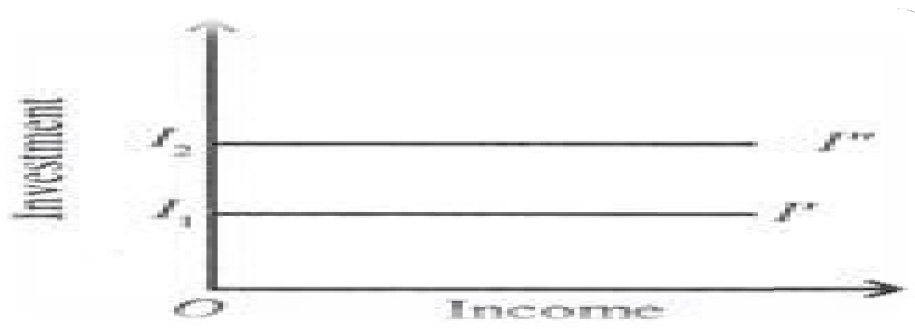


FIG.3.2 Autonomous Investment

3.3. Determinants of the level of Investment:

The decision to invest in a new capital asset depends on whether the expected rate of return on the new investment is equal to or greater or less than the rate of interest to be paid on the funds needed to purchase this asset. It is only when the expected rate of return is higher than the interest rate that investment will be made in acquiring new capital assets. In reality, there are three factors that are taken into consideration while making any investment decision. They are the cost of the capital asset, the expected rate of return from it during its lifetime, and the market rate of interest. Keynes sums up these factors in his concept of the marginal efficiency of capital (MEC).

3.3.1. Marginal Efficiency of Capital:

The marginal efficiency of capital is the highest rate of return expected from an additional unit of a capital asset over its cost. In the words of Kurihara, "It is the ratio between the prospective yield to additional capital goods and their supply price." The prospective yield is the aggregate net return from an asset during its life time, while the supply price is the cost of producing this asset. If the supply price of a capital asset is Rs. 20,000 and its annual yield is Rs. 2,000, the marginal efficiency of this asset is $2000/20000 \times 100/1 = 10$ per cent. Thus the marginal efficiency of capital is the percentage of profit expected from a given investment on a capital asset. Keynes relates the prospective yield of a capital asset to its supply price and defines the MEC as "equal to the rate of discount which would make the present value of the series of annuities given by the returns expected from the capital assets during its life just equal to its supply price." Symbolically, this can be expressed as:

$$S_P = R_1 / (1+i) + R_2 / (1+i)^2 + R_n / (1+i)^n$$

Where S_P is the supply price or the cost of the capital asset, R_1 R_2 ... and R_n are the prospective yields or the series of expected annual returns from the capital asset in the years, 1, 2 and n , i is the rate of discount which makes the capital asset exactly equal to the present value of the expected yield from it. This i is the MEC or the rate of discount which equates the two sides of the equation.

If the supply price of a new capital asset is Rs 1,000 and its life is two years, it is expected to yield Rs 550 in the first year and Rs 605 in the second year. Its MEC is 10 per cent which equates the supply price to the expected yields of this capital asset. Thus, (Sp) Rs 1000 = $550 / (1.10) + (605) / (1.10)^2 = \text{Rs. } 500 + 500$. The term $R_1 / (1+i)$ is the present value (PV) of the capital asset. The present value is “the value of payments to be received in the future.” It depends on the rate of interest at which it is discounted. Suppose we expect to receive Rs 100 from a machine in a year’s time and the rate of interest is 5 per cent. The present value of this machine is

$$R_1 / (1 + i) = 100 / (1.05) = \text{Rs } 95.24$$

If we expect Rs 100 from the machine after two years then its present value is $100 / (1.05)^2 = \text{Rs } 90.70$. The present value of a capital asset is inversely related to the rate of interest. The lower the rate of interest, the higher is the present value, and vice versa. For instance, if the rate of interest is 5 per cent, PV of an asset of Rs 100 for one year will be Rs 95.24; at 7 per cent interest rate, it will be Rs 93.45; and at 10 per cent interest rate, it will be Rs 90.91. The relation between the present value and the rate of interest is shown in Figure 3.3, where the rate of interest is taken on the horizontal axis while the present value of the project on the vertical axis. The curve PR shows the inverse relation between the present value and the rate of interest. If the current rate of interest is i_1 the present value of the project is P_1 . On the other hand, a higher rate of interest (i_2) will lead to a lower present value (P_2) when the present value curve (PR) cuts the horizontal axis at point (Z), the net present value becomes zero.

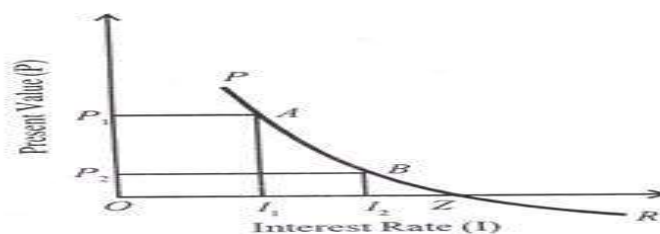


Fig. 3.3 Determinants of Investment

As a matter of fact, the MEC is the expected rate of return over cost of a new capital asset. In order to find out whether it is worthwhile to purchase

a capital asset it is essential to compare the present value of the capital asset with its cost or supply price. If the present value of a capital asset exceeds its cost of buying, it pays to buy it. On the contrary, if its present value is less than its cost, it is not worthwhile investing in this capital asset. The same results can be had by comparing the MEC with the market rate of interest. If the MEL of a capital asset is higher than the market rate of interest at which it is borrowed, it pays to purchase the capital asset, and vice versa. If the market interest rate equals the MEC of the capital asset, the firm is said to possess the optimum capital stock.

If the MEC is higher than the rate of interest, there will be a tendency to borrow funds in order to invest in new capital assets. If the MEC is lower than the rate of interest, no firm will borrow to invest in capital assets. Thus the equilibrium condition for a firm to hold the optimum capital stock is where the MEC equals the interest rate. Any disequilibrium between the MEC and the rate of interest can be removed by changing the capital stock, and hence the MEC or by changing the rate of interest or both. Since the stock of capital changes slowly, therefore, changes in the rate of interest are more important for bringing equilibrium. The above arguments which have been applied to a firm are equally applicable to the economy.

Figure 3.4 shows the MEC curve of an economy. It has a negative slope (from left to right downward) which indicates that the higher the MEC, the smaller the capital stock. Or, as the capital stock increases, the MEC falls. This is because of the operation of the law of diminishing returns in production.

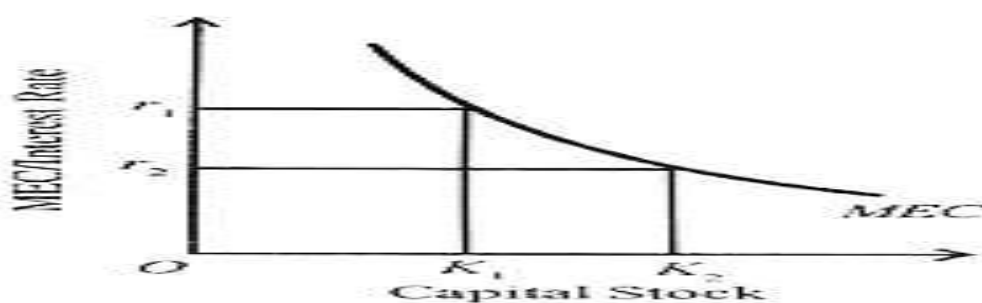


Fig. 3.4 Marginal Efficiency of Capital

As a result, the marginal physical productivity of capital and the marginal revenue fall. In the figure, when the capital stock is OK_1 , the MEC is Or_1 . As the capital increases from OK_1 to OK_2 the MEC falls from Or_1 to Or_2 . The net addition to the capital stock K_1K_2 represents the net investment in the economy. Further, to reach the optimum (desired) capital stock in the economy, the MEC must equal the rate of interest. If, as shown in the figure, the existing capital stock is OK_1 the MEC is Or_2 and the rate of interest is at Or_1 . Everyone in the economy will borrow funds and invest in capital assets. This is because MEC (Or_1) is higher than the rate of interest (at Or_2). This will continue till the MEC (Or_1) comes down to the level of the interest rate (at Or_2). When the MEC equals the rate of interest, the economy reaches the level of optimum capital stock.

The fall in the MEC is due to the increase in the actual capital stock from OK_2 to the optimum (desired) capital stock OK_2 . The increase in the firm's capital stock by K_1K_2 is the net investment of the firm. But it is the rate of interest which determines the size of the optimum capital stock in the economy. And it is the MEC which relates the amount of desired capital stock to the rate of interest. Thus the negative slope of the MEC curve indicates that as the rate of interest falls the optimum stock of capital increases.

3.3.2. The Marginal Efficiency of Investment (MEI):

The marginal efficiency of investment is the rate of return expected from a given investment on a capital asset after covering all its costs, except the rate of interest. Like the MEC, it is the rate which equates the supply price of a capital asset to its prospective yield. The investment on an asset will be made depending upon the interest rate involved in getting funds from the market. If the rate of interest is high, investment is at a low level. A low rate of interest leads to an increase in investment. Thus the MEI relates the investment to the rate of interest. The MEI schedule shows the amount of investment demanded at various rates of interest. That is why, it is also called the investment demand schedule or curve which has a negative slope, as shown in Fig. 3.5(A). At Or_1 rate of interest, investment is OF . As the rate of interest falls to Or_2 , investment increases to OI ”.

Fig. 3.5 (A) and (B) Marginal Efficiency of Investment

To what extent the fall in the interest rate will increase investment depends upon the elasticity of the investment demand curve or the MEI curve. The less elastic is the MEI curve, the lower is the increase in investment as a result of fall in the rate of interest, and vice versa. In Figure 3.5 the vertical axis measures the interest rate and the MEI and the horizontal axis measures the amount of investment. The MEI and MEI' are the investment demand curves. The MEI curve in Panel (A) is less elastic to investment which increases by I_1I_2' . This is less than the increase in investment I_1I_2'' shown in Panel (B) where the MEI' curve is elastic. Thus given the shape and position of the MEI curve, a fall in the interest rate will increase the volume of investment.

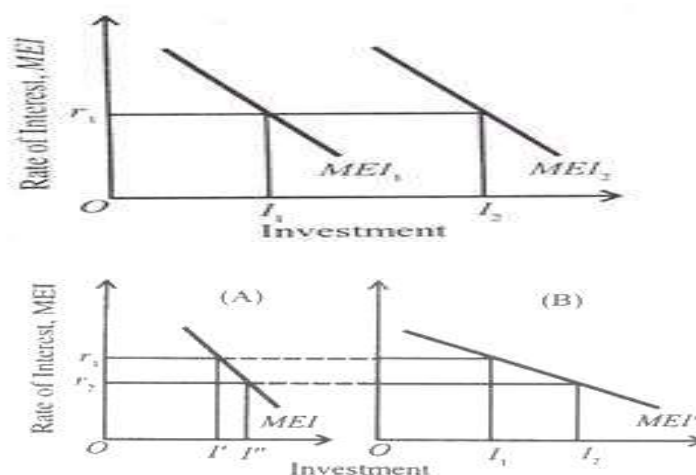


Fig. 3.6 Interest rate on MEI

On the other hand, given the rate of interest, the higher the MEI, the larger shall be the volume of investment. The higher marginal efficiency of investment implies that the MEI curve shifts to the right. When the existing capital assets wear out, they are replaced by new ones and level of investment increases. But the amount of induced investment depends on the existing level of total purchasing. So more induced investment occurs when the total purchasing is higher. The higher total purchasing tends to shift the MEI to the right indicating that more inducement to investment takes place at a given level of interest rate. This is explained in Figure 3.6, where MEI₁ and MEI₂ curves indicate two different levels of total purchasing in the economy. Let us suppose that the MEI₁ curve indicates that at Rs 200

crores of total purchasing, OI_1 (Rs 20 crores) investment occurs at Or_1 interest rate. If total purchasing rises to Rs 500 crores, the MEI_1 curve shifts to the right as MEI_2 and the level of induced investment increases to OI_2 (Rs 50 crores) at the same interest rate Or_1 .

Distinction between MEC and MEI:

Keynes did not distinguish between the marginal efficiency of capital (MEC) and the marginal efficiency of investment (MEI).

But modern economists have made clear distinctions between the two concepts as follows:

- The MEC is based on a given supply price for capital, and the MEI on induced changes in this price.
- The MEC shows the rate of return on all successive units of capital without regard to the existing stock of capital. On the other hand, the MEI shows the rate of return on only units of capital over and above the existing stock of capital.
- In the MEC, the capital stock is taken on the horizontal axis of a diagram, while in the MEI the amount of investment is taken horizontally on the X-axis.
- The MEC is a 'stock' concept, and the MEI is a 'flow' concept.
- The MEC determines the optimum capital stock in an economy at each level of interest rate. The MEI determines the net investment of the economy at each interest rate, given the capital stock.

3.4. Factors other than the Interest Rate Affecting Inducement to

Invest:

Some of the major factors which affect the inducement to invest are discussed below:

(1) Element of Uncertainty:

According to Keynes, the MEC is more volatile than the rate of interest. This is because the prospective yield of capital assets depends upon the business expectations. These business expectations are very uncertain. "They may change quickly and drastically in response to the general mood of the business community, rumours, news of technical developments, political events, even directors' ulcers may cause a sudden rise or fall of the expected

rate of yield."As a result, it is difficult to calculate the expected annual returns on the life of a capital asset. Further, because of uncertainty, investment projects usually have a short pay-off period. Capital assets become obsolete earlier than their expected life due to rapid technological developments. The rate of depreciation also does not remain constant and varies much. So firms have a tendency to invest only if they are in a position to recover the capital outlay in a short period. These factors tend to bring instability in the investment function.

(2) Existing Stock of Capital Goods:

If the existing stock of capital goods is large, it would discourage potential investors from entering into the making of goods. Again, the induced investment will not take place if there is excess or idle capacity in the existing stock of capital assets. In case the existing stock of machines is working to its full capacity, an increase in the demand for goods manufactured by them will raise the demand for capital goods of this type and raise the inducement to invest. But it is the capital stock which influences the MEC. The MEC and the capital stock are inversely related.

(3) Level of Income:

If the level of income rises in the economy through rise in money wage rates and other factor prices, the demand for goods will rise which will, in turn, raise the inducement to invest. Contrariwise, the inducement to investment will fall with the lowering of income levels.

(4) Consumer Demand:

The present and future demand for the products greatly influences the level of investment in the economy. If the current demand for consumer goods is increasing rapidly more investment will be made. Even if we take the future demand for the products, it will be considerably influenced by their current demand and both will influence the level of investment. Investment will be low if the demand is low, and vice versa.

(5) Liquid Assets:

The amount of liquid assets with the investors also influences the inducement to invest. If they possess large liquid assets, the inducement to invest is high. This is especially the case with those firms which keep large

reserve funds and undistributed profits. On the contrary, the inducement to invest is low for investors having little liquid assets.

(6) Inventions and Innovations:

Inventions and innovations tend to raise the inducement to invest. If inventions and technological improvements lead to more efficient methods of production which reduce costs, the MEC of new capital assets will rise. Higher MEC will induce firms to make larger investments in the new capital assets and in related ones. The absence of new technologies will mean low inducement to invest. An innovation also includes the opening of new areas. This requires the development of means of transport, the construction of houses, etc., leading to new investment opportunities. Thus inducement to invest rises.

(7) New Products:

The nature of new products in terms of sales and costs may also influence their MEC and hence investment. If the sale prospects of a new product are high and the expected revenues more than the costs, the MEC will be high which will encourage investment in this and related industries. For example, the invention of television must have encouraged the electronics industry to invest in these capital assets and used them to produce television sets, if they had expected profits to be higher than costs. Thus lower maintenance and operating costs in the case of new products are important in increasing the inducement to invest.

(8) Growth of Population:

A rapidly growing population means a growing market for all types of goods in the economy. To meet the demand of an increasing population in all brackets, investment will increase in all types of consumer goods industries. On the other hand, a declining population results in a shrinking market for goods thereby lowering the inducement to invest.

(9) State Policy:

The economic policies of the government have an important influence on the inducement to invest in the country. If the state levies heavy progressive taxes on corporations, the inducement to invest is low, and vice versa. Heavy indirect taxation tends to raise the prices of commodities and

adversely affects their demand thereby lowering the inducement to invest, and vice versa. If the state follows the policy of nationalisation of industries, the private enterprise would be discouraged to invest. On the other hand, if the state encourages private enterprise by providing credit, power and other facilities, inducement to invest will be high.

(10) Political Climate:

Political conditions also affect the inducement to invest. If there is political instability in the country, the inducement to invest may be affected adversely. In the struggle for power, the rival parties may create unrest through hostile trade union activities thus creating uncertainty in business. On the other hand, a stable government creates confidence in the business community whereby the inducement to invest is raised. Similarly, the danger of a revolution or war with some other country has an adverse effect on the inducement to invest, whereas peace and prosperity tend to raise it.

3.5. Tobin's Q Theory of Investment

Introduction:

Nobel laureate economist James Tobin has proposed the theory of investment which links a firm's investment decisions to fluctuations in the stock market. When a firm finances its capital for investment by issuing shares in the stock market, its share prices reflect the investment decisions of the firm.

Firm's investment decisions depend on the following ratio, called Tobin's q:

$$q = \text{Market Value of Capital Stock} / \text{Replacement Cost of Capital}$$

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. Thus Tobin's q theory explains net investment by relating the market value of firm's financial assets (the market value of its shares) to the replacement cost of its real capital (shares). According to Tobin, net investment would depend on whether q is greater than ($q > 1$) or less than 1 ($q < 1$). If $q > 1$, the market value of the firm's shares in the stock market is more than the replacement cost of its real capital, machinery etc.

The firm can buy more capital and issue additional shares in the stock market. In this way, by selling new shares, the firm can earn profit and finance new investment. Conversely, if $q < 1$, the market value of its shares is less than its replacement cost and the firm will not replace capital (machinery) as it wears out.

Let us explain it with the help of an example. Suppose a firm raises finance for investment by issuing 10 lakh shares in the stock market at Rs 10 per share. Currently, their market value is Rs 20 per share. If the replacement cost of the firm's real capital is Rs 2 crores then the q ratio is 1.00 (= Rs 2 crores market value / Rs 2 crores replacement cost). Suppose the market value rises to Rs 40 per share. Now the q ratio is 2 (=Rs 40/Rs20). Now the market value of its shares gives Rs 2 crores (=Rs 4 crores-Rs 2 crores) as profit to the firm. The firm raises its capital stock by issuing 5 lakh additional shares at Rs 40 per share. Rs 2 crores collected through the sale of 5 lakh shares are utilised for financing new investment by the firm.

Panels (A) and (B) of Fig. 3.7 illustrate how an increase in Tobin's q induces a rise in the firm's new investment. It shows that an increase in the demand for shares raises their market value which raises the value of q and investment. The demand for capital is shown by the demand curve D in Panel (A). The relative value of q is taken as unity, as the market value and replacement cost of capital stock are assumed equal. The initial equilibrium is determined by the interaction of demand for capital and the available supply of capital stock OK at point E , which is fixed in the short run. The demand for capital depends mainly on two factors. First, the level of wealth of the people. The higher is the level of wealth, the more shares people wish to have in their wealth portfolio. Second, the real return on other assets such as government bonds or real estate. A fall in the real interest rate on government bonds would induce people to invest in shares than in other forms of wealth. This would increase the demand for capital and raise the market value of capital above its replacement cost.

This means rise in the value of Tobin's q above unity. This is shown as the rightward shift of the demand curve to D_1 . The new equilibrium is established at E_1 in the long run when the replacement cost rises and

equals the market value of capital. The rise in the value of q to q_1 induces an increase in new investment to OI , as shown in Panel (B) of the figure.

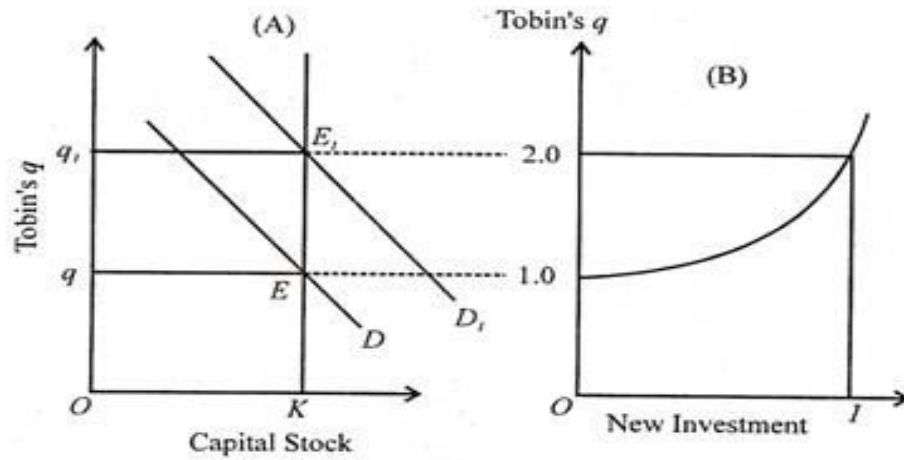


Fig.3.7 (A) & (B) Tobin Q theory

Implications:

Tobin's q theory of investment has important implications. Tobin's q ratio provides an incentive to invest for firms on the basis of the stock market. It not only reflects the current profitability of capital but also its expected future profitability. Investment is expected to be higher in the future when the value of q is larger than 1. Tobin's q theory of investment induces firms to undertake net investment even when q is less than 1 in the present.

Unit IV

THEORY OF INFLATION

4.1. Introduction:

Different economists have presented different theories on inflation. The economists who have provided the theories of inflation are broadly categorized into two labels, namely, monetarists and structuralists. Monetarists associated inflation to the monetary causes and suggested monetary measures to control it. On the other hand, structuralists believed that the inflation occurs because of the unbalanced economic system and they used both monetary and fiscal measures together for sorting out economic problems.

4.2. Meaning of Inflation:

To the neo-classical and their followers at the University of Chicago, inflation is fundamentally a monetary phenomenon. In the words of Friedman, "Inflation is always and everywhere a monetary phenomenon...and can be produced only by a more rapid increase in the quantity of money than output." But economists do not agree that money supply alone is the cause of inflation. As pointed out by Hicks, "Our present troubles are not of a monetary character." Economists, therefore, define inflation in terms of a continuous rise in prices. Johnson defines "inflation as a sustained rise" in prices. Brooman defines it as "a continuing increase in the general price level." Shapiro also defines inflation in a similar vein "as a persistent and appreciable rise in the general level of prices." Demberg and McDougall are more explicit when they write that "the term usually refers to a continuing rise in prices as measured by an index such as the consumer price index (CPI) or by the implicit price deflator for gross national product." However, it is essential to understand that a sustained rise in prices may be of various magnitudes. Accordingly, different names have been given to inflation depending upon the rate of rise in prices.

1. Creeping Inflation:

When the rise in prices is very slow like that of a snail or creeper, it is called creeping inflation. In terms of speed, a sustained rise in prices of annual increase of less than 3 per cent per annum is characterised as

creeping inflation. Such an increase in prices is regarded safe and essential for economic growth.

2. Walking or Trotting Inflation:

When prices rise moderately and the annual inflation rate is a single digit. In other words, the rate of rise in prices is in the intermediate range of 3 to 6 per cent per annum or less than 10 per cent. Inflation at this rate is a warning signal for the government to control it before it turns into running inflation.

3. Running Inflation:

When prices rise rapidly like the running of a horse at a rate or speed of 10 to 20 per cent per annum, it is called running inflation. Such an inflation affects the poor and middle classes adversely. Its control requires strong monetary and fiscal measures, otherwise it leads to hyperinflation.

4. Hyperinflation:

When prices rise very fast at double or triple digit rates from more than 20 to 100 per cent per annum or more, it is usually called runaway or galloping inflation. It is also characterised as hyperinflation by certain economists. In reality, hyperinflation is a situation when the rate of inflation becomes immeasurable and absolutely uncontrollable. Prices rise many times every day. Such a situation brings a total collapse of monetary system because of the continuous fall in the purchasing power of money.

The speed with which prices tend to rise is illustrated in Figure 4.1. The curve C shows creeping inflation when within a period of ten years the price level has been shown to have risen by about 30 per cent. The curve W depicts walking inflation when the price level rises by more than 50 per cent during ten years. The curve R illustrates running inflation showing a rise of about 100 per cent in ten years. The steep curve H shows the path of hyperinflation when prices rise by more than 120 per cent in less than one year.

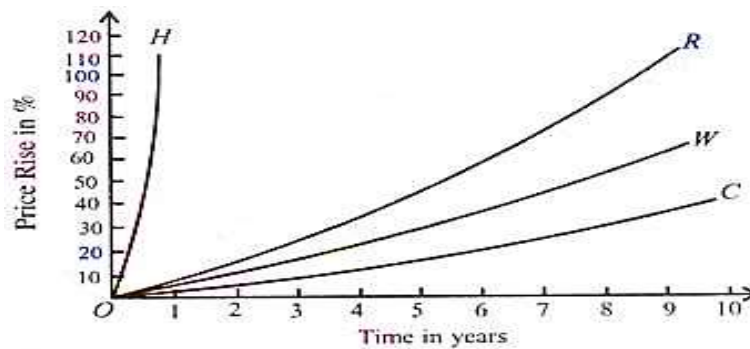


Fig. 4.1 Inflation

4.3. DEMAND – PULL OR MONETARY THEORY OF INFLATION

Demand - Pull inflation or excess demand inflation is the traditional and most common type of inflation. It takes place when aggregate demand is rising while the available supply of goods is becoming less. Goods may be in short supply either because resources are fully utilised or production cannot be increased rapidly to meet the increasing demand. As a result, prices begin to rise in response to a situation often described as “too much money chasing too few goods”. There are two principal theories about the demand pull inflation that of the monetarist and Keynesians.

Monetarist View or Monetary theory of Inflation:

The monetarists emphasise the role of money as the principal cause of demand-pull inflation. They contend that inflation is always a monetary phenomenon. Its earliest explanation is to be found in the simple quantity theory of money. The monetarists employ the familiar identity of Fisher’s Equation of Exchange.

$$MV = PQ$$

Where M is the money supply, V is the velocity of money, P is the price level, and Q is the level of real output. Assuming V and Q as constant, the price level (P) varies proportionately with the supply of money (M). With flexible wages, the economy was believed to operate at full employment level. The labour force, the capital stock, and technology also changed only slowly over time. Consequently, the amount of money spent did not affect the level of real output so that a doubling of the quantity of money would result simply in doubling the price level. Until prices had risen by this proportion, individuals and firms would have excess cash which they would spend,

leading to rise in prices. So inflation proceeds at the same rate at which the money supply expands. In this analysis the aggregate supply is assumed to be fixed and there is always full employment in the economy. Naturally, when the money supply increases it creates more demand for goods but the supply of goods cannot be increased due to the full employment of resources. This leads to rise in prices. But it is a continuous and prolonged rise in the money supply that will lead to true inflation.

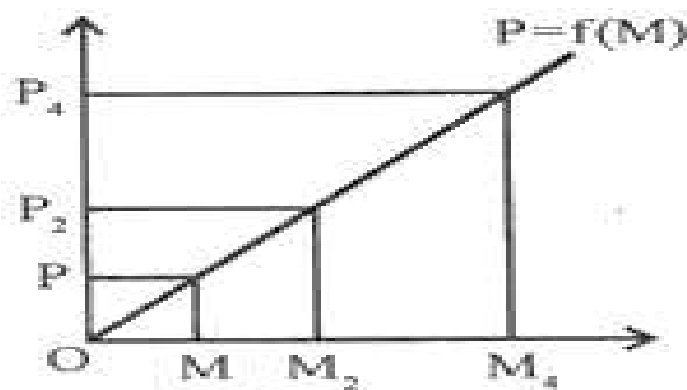


Fig.4.2 Monetary theory of Inflation

This classical theory of inflation is explained in Fig. 4.2 where the quantity of money is taken on horizontal line and the price level on vertical line. When the quantity of money is OM , the price level is OP . When the quantity of money is doubled to OM_2 the price level is also doubled to P_2 . Further, when the quantity of money is increased four-fold to M_4 , the price level also increases by four times to P_4 . This relationship is expressed by the curve $P = f(M)$ from the origin at 45° .

Friedman’s View:

Modern quantity theorists led by Friedman hold that “inflation is always and everywhere a monetary phenomenon that arises from a more rapid expansion in the quantity of money than in total output.” He argues that changes in the quantity of money will work through to cause changes in nominal income. Inflation everywhere is based on an increased demand for goods and services as people try to spend their cash balances. Since the demand for money is fairly stable, this excess spending is the outcome of a

rise in the nominal quantity of money supplied to the economy. So inflation is always a monetary phenomenon.

Next Friedman discusses whether an increase in money supply will go first into output or prices. Initially, when there is monetary expansion, the nominal income of the people increases. Its immediate effect will be to increase the demand for labour. Workers will settle for higher wages. Input costs and prices will rise. Profit margins will be reduced and the prices of products will increase. In the beginning, people do not expect prices to continue rising. They regard the price rise as temporary and expect prices to fall later on. Consequently, they tend to increase their money holdings and the price rise is less than the rise in nominal money supply. Gradually people tend to readjust their money holdings. Price then rise more than in proportion to the money supply.

The precise rate at which prices rise for a given rate of increase in the money supply depends on such factors as past price behaviour, current changes in the structure of labour, product markets and fiscal policy. Thus, according to Friedman, the monetary expansion works through output before inflation starts. The quantity theory version of the demand-pull inflation is illustrated diagrammatically in Figure 4.3 (A) & (B). Suppose the money supply is increased at a given price level P as determined by D and S curves in Panel (B) of the figure. The initial full employment situation at this price level is shown by the intersection of IS and LM curves at E in Panel (A) of the figure where R is the interest rate and Y_F is the full employment level of income. Now with the increase in the quantity of money, the LM curve shifts rightward to LM_1 and intersects the IS curve at E_1 such that the equilibrium level of income rises to Y_1 and the rate of interest is lowered to R_1 . As the aggregate supply is assumed fixed, there is no change in the position of the IS curve.

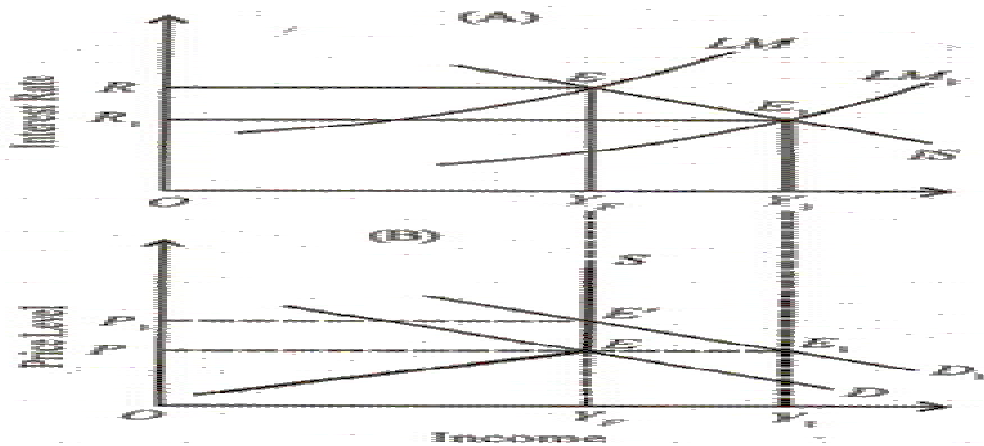


Fig.4.3 Friedman view

Consequently, the aggregate demand rises which shifts the D curve to the right to D_1 and thus excess demand is created. Income equivalent to EE_1 ($= Y_F Y_1$) in Panel (B) of the figure. This raises the price level, the aggregate supply being fixed, as shown by the vertical portion of the supply curve S. The rise in the price level reduces the real value of the money supply so that the LM_1 curve shifts to the left to LM. Excess demand will not be eliminated until aggregate demand curve D_1 , cuts the aggregate supply curve S at E' . This means a higher price level P_1 in Panel (B) and return to the original equilibrium position E in the upper Panel of the figure where the IS curve cuts the LM curve. The “result, then is self-limiting, and the price level rises in exact proportion to the real value of the money supply to its original value”.

4.4. STRUCTURAL INFLATION:

The structural school of South America structural rigidities as the principal cause of inflation in such developing countries as Argentina, Brazil, and Chile. The structuralists hold the view that inflation is necessary with growth. According to this view, as the economy develops, rigidities arise which lead to structural inflation. There are increases in non-agricultural incomes accompanied by high growth rate of population that tend to increase the demand for goods. In fact, the pressure of population growth and raising urban incomes would tend to raise through a chain reaction

mechanism. First, the prices of agricultural goods, second, the general price level, and third, wages let us analyse them.

As the demand for agricultural goods raises, their domestic supply being inelastic the prices of agricultural goods rise. The output of these goods does not increase when their price rise because their production is inelastic due to a defective system of land tenure and other rigidities in the form of lack of irrigation, finance, storage and marketing facilities, and bad harvests. To prevent the continuous rise in agricultural products, especially food products, they can be imported. This tends to raise the price level further within the economy.

When the prices of food products rise, wage earners press for increase in wage rates to compensate for the fall in their real incomes. Therefore, rose whenever the cost of living index raises above the agreed upon which further increases the demand for goods and a further rise in their prices. The effect of increase in the wage rates on prices is illustrated in Figure 4.4. When wage rate raises, the aggregate demand for goods increases from D_1 to D_2 . But the aggregate supply falls due to increase in labour cost which results in the shifting of aggregate supply curve from S_1S_1 to S_2S_2 . Since the production of goods is inelastic due to structural rigidities after a point, the supply curve is shown as vertical from point E_1 onwards. The initial equilibrium is at E_1 where the curves D_2 and S_2 intersect at the output level OY_1 and the price level is OP_2 . When supply falls due to increase in labour costs, the supply curve shifts from S_1 to S_2 and it intersects the demand curve D_1 at E_2 and production falls from OY_1 to OY_2 and the price level rises from OP_1 to OP_2 .

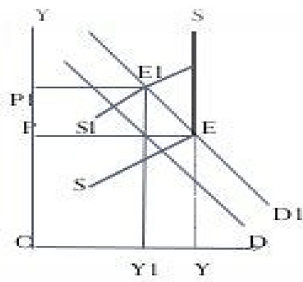


Fig. 4.4 Structural Inflation

Another cause of structural inflation is that the rate of export growth in a developing economy is slow and unstable which is inadequate to support the required growth rate of the economy.

4.5. Phillip Curve in Economics: The Relation between Unemployment and Inflation

The Phillips curve examines the relationship between the rate of unemployment and the rate of money wage changes. Known after the British economist A. W. Phillips who first identified it, it expresses an inverse relationship between the rate of unemployment and the rate of increase in money wages. Basing his analysis on data for the United Kingdom, Phillips derived the empirical relationship that when unemployment is high, the rate of increase in money wage rates is low. This is because “workers are reluctant to offer their services at less than the prevailing rates when the demand for labour is low and unemployment is high so that wage rates fall very slowly.” On the other hand, when unemployment is low, the rate of increase in money wage rates is high. This is because, “when the demand for labour is high and there are very few unemployed we should expect employer to bid wage rates up quite rapidly.” The second factor which influences this inverse relationship between money wage rate and unemployment is the nature of business activity. In a period of rising business activity when unemployment falls with increasing demand for labour, the employers will bid up wages.

Conversely, in a period of falling business activity when demand for labour is decreasing and unemployment is rising, employers will be reluctant to grant wage increases. Rather, they will reduce wages. But workers and unions will be reluctant to accept wage cuts during such

periods. Consequently, employers are forced to dismiss workers, thereby leading to high rates of unemployment. Thus when the labour market is depressed, a small reduction in wages would lead to large increase in unemployment. Phillips concluded on the basis of the above arguments that the relation between rates of unemployment and a change of money wages would be highly non-linear when shown on a diagram. Such a curve is called the Phillips curve. The PC curve in Figure 4.5 is the Phillips curve which relates percentage change in money wage rate (\dot{W}) on the vertical axis with the rate of unemployment (U) on the horizontal axis. The curve is convex to the origin which shows that the percentage change in money wages rises with decrease in the employment rate.

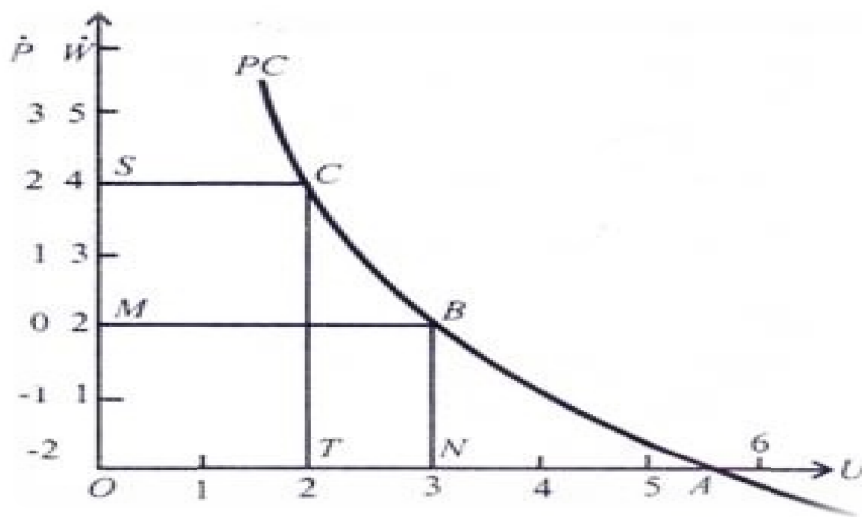


Fig. 4.5 Philip curve

In the figure, when the money wage rate is 2 per cent, the unemployment rate is 3 per cent. But when the wage rate is high at 4 per cent, the unemployment rate is low at 2 per cent. Thus there is a trade-off between the rate of change in money wage and the rate of unemployment. This means that when the wage rate is high the unemployment rate is low and vice versa. The original Phillips curve was an observed statistical relation which was explained theoretically by Lipsey as resulting from the behaviour of labour market in disequilibrium through excess demand. Several economists have extended the Phillips analysis to the trade-off between the rate of unemployment and the rate of change in the level of prices or

inflation rate by assuming that prices would change whenever wages rose more rapidly than labour productivity. If the rate of increase in money wage rates is higher than the growth rate of labour productivity, prices will rise and vice versa. But prices do not rise if labour productivity increases at the same rate as money wage rates rise.

This trade-off between the inflation rate and unemployment rate is explained in Figure where the inflation rate (p) is taken along with the rate of change in money wages (W). Suppose labour productivity rises by 2 per cent per year and if money wages also increase by 2 per cent, the price level would remain constant. Thus point B on the PC curve corresponding to percentage change in money wages (M) and unemployment rate of 3 per cent (N) equals zero (O) per cent inflation rate (p) on the vertical axis. Now assume that the economy is operating at point B. If now, aggregate demand is increased, this lowers the unemployment rate to OT (2%) and raises the wage rate to OS (4%) per year. If labour productivity continues to grow at 2 per cent per annum, the price level will also rise at the rate of 2 per cent per annum at OS in the figure.

The economy operates at point C. With the movement of the economy from B to C, unemployment falls to T (2%). If point's B and C are connected, they trace out a Phillips curve PC. Thus money wages rate increase which is in excess of labour productivity leads to inflation. To keep wage increase to the level of labour productivity (OM) in order to avoid inflation, ON rate of unemployment will have to be tolerated. The shape of the PC curve further suggests that when the unemployment rate is less than 5 ½ per cent (that is, to the left of point A), the demand for labour is more than the supply and this tends to increase money wage rates. On the other hand, when the unemployment rate is more than 5 ½ per cent (to the right of point A), the supply of labour is more than the demand which tends to lower wage rates. The implication is that the wage rates will be stable at the unemployment rate OA which is equal to 5 ½ per cent per annum. It is to be noted that PC is the "conventional" or original downward sloping Phillips curve which shows a stable and inverse relation between the rate of unemployment and the rate of change in wages.

4.5.1. Friedman's View: The Long-Run Phillips Curve:

Economists have criticised and in certain cases modified the Phillips curve. They argue that the Phillips curve relates to the short run and it does not remain stable. It shifts with changes in expectations of inflation. In the long run, there is no trade-off between inflation and employment. These views have been expounded by Friedman and Phelps' in what has come to be known as the "accelerations" or the "adaptive expectations" hypothesis. According to Friedman, there is no need to assume a stable downward sloping Phillips curve to explain the trade-off between inflation and unemployment. In fact, this relation is a short-run phenomenon. But there are certain variables which cause the Phillips curve to shift over time and the most important of them is the expected rate of inflation. So long as there is discrepancy between the expected rate and the actual rate of inflation, the downward sloping Phillips curve will be found. But when this discrepancy is removed over the long run, the Phillips curve becomes vertical.

In order to explain this, Friedman introduces the concept of the natural rate of unemployment. It represents the rate of unemployment at which the economy normally settles because of its structural imperfections. It is the unemployment rate below which the inflation rate increases, and above which the inflation rate decreases. At this rate, there is neither a tendency for the inflation rate to increase or decrease. Thus the natural rate of unemployment is defined as the rate of unemployment at which the actual rate of inflation equals the expected rate of inflation. It is thus an equilibrium rate of unemployment towards which the economy moves in the long run. In the long run, the Phillips curve is a vertical line at the natural rate of unemployment.

This natural or equilibrium unemployment rate is not fixed for all times. Rather, it is determined by a number of structural characteristics of the labour and commodity markets within the economy. These may be minimum wage laws, inadequate employment information, deficiencies in manpower training, costs of labour mobility, and other market imperfections. But what causes the Phillips curve to shift over time is the

expected rate of inflation. This refers to the extent the labour correctly forecasts inflation and can adjust wages to the forecast. Suppose the economy is experiencing a mild rate of inflation of 2 per cent and a natural rate of unemployment (N) of 2 per cent. At point A on the short-run Phillips curve SPC_1 in Figure 4.6, people expect this rate of inflation to continue in the future.

Now assume that the government adopts a monetary-fiscal programme to raise aggregate demand in order to lower unemployment from 3 to 2 per cent. The increase in aggregate demand will raise the rate of inflation to 4 per cent consistent with the unemployment rate of 2 per cent. When the actual inflation rate (4 per cent) is greater than the expected inflation rate (2 per cent), the economy moves from point A to B along the SPC_1 curve, and the unemployment rate temporarily falls to 2 per cent. This is achieved because the labour has been deceived. It expected the inflation rate of 2 per cent and based their wage demands on this rate. But the workers eventually begin to realise that the actual rate of inflation is 4 per cent which now becomes their expected rate of inflation. Once this happens the short-run Phillips curve SPC_1 shifts to the right to SPC_2 . Now workers demand increase in money wages to meet the higher expected rate of inflation of 4 per cent.

They demand higher wages because they consider the present money wages to be inadequate in real terms. In other words, they want to keep up with higher prices and to eliminate fall in real wages. As a result, real labour costs will rise, firms will discharge workers and unemployment will rise from B (2%) to C (3%) with the shifting of the SPC_1 curve to SPC_2 . At point C, the natural rate of unemployment is re-established at a higher rate of both the actual and expected inflation (4%). If the government is determined to maintain the level of unemployment at 2 per cent, it can do so only at the cost of higher rates of inflation. From point C, unemployment once again can be reduced to 2 per cent via increase in aggregate demand along the SCP_2 curve until we arrive at point D. With 2 per cent unemployment and 6 per cent inflation at point D, the expected rate of inflation for workers is 4 per cent.

As soon as they adjust their expectations to the new situation of 6 per cent inflation, the short-run Phillips curve shifts up again to SPC_3 and the unemployment will rise back to its natural level of 3 per cent at point E. If points A, C and E are connected, they trace out a vertical long-run Phillips curve LPC at the natural rate of unemployment. On this curve, there is no trade-off between unemployment and inflation. Rather, any one of several rates of inflation at points A, C and E is compatible with the natural unemployment rate of 3 per cent. Any reduction in unemployment rate below its natural rate will be associated with an accelerating and ultimately explosive inflation. But this is only possible temporarily so long as workers overestimate or underestimate the inflation rate. In the long-run, the economy is bound to establish at the natural unemployment rate.

There is, therefore, no trade-off between unemployment and inflation except in the short run. This is because inflationary expectations are revised according to what has happened to inflation in the past. So when the actual rate of inflation, say, rises to 4 per cent in Figure 4.6, workers continue to expect 2 per cent inflation for a while and only in the long run they revise their expectations upwards towards 4 per cent. Since they adapt themselves to the expectations, it is called the adaptive expectations hypothesis. According to this hypothesis, the expected rate of inflation always lags behind the actual rate. But if the actual rate remains constant the expected rate would ultimately become equal to it. This leads to the conclusion that a short run trade-off exists between unemployment and inflation, but there is no long run trade-off between the two unless a continuously rising inflation rate is tolerated.

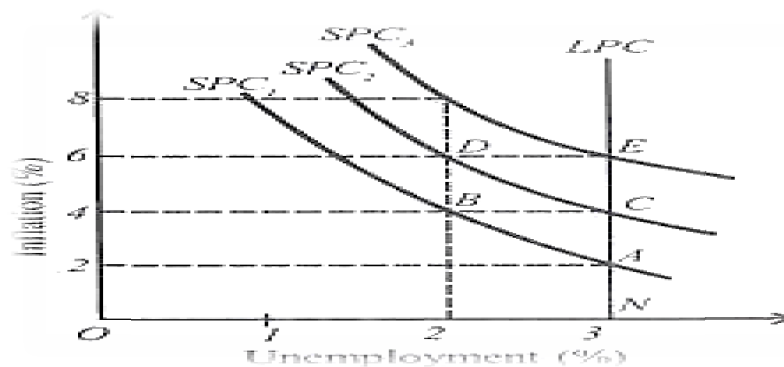


Fig. 4.6 Long Run Philip curve

Criticisms:

The accelerations hypothesis of Friedman has been criticised on the following grounds:

1. The vertical long-run Phillips curve relates to the steady rate of inflation. But this is not a correct view because the economy is always passing through a series of disequilibrium positions with little tendency to approach a steady state. In such a situation, expectations may be disappointed year after year.
2. Friedman does not give a new theory of how expectations are formed that would be free from theoretical and statistical bias. This makes his position unclear.
3. The vertical long-run Phillips curve implies that all expectations are satisfied and that people correctly anticipate the future inflation rates. Critics point out that people do not anticipate inflation rates correctly, particularly when some prices are almost certain to rise faster than others. There are bound to be disequilibria between supply and demand caused by uncertainty about the future and that is bound to increase the rate of unemployment. Far from curing unemployment, a dose of inflation is likely to make it worse.
4. In one of his writings Friedman himself accepts the possibility that the long-run Phillips curve might not just be vertical, but could be positively sloped with increasing doses of inflation leading to increasing unemployment.
5. Some economists have argued that wage rates have not increased at a high rate of unemployment.
6. It is believed that workers have a money illusion. They are more concerned with the increase in their money wage rates than real wage rates.
7. Some economists regard the natural rate of unemployment as a mere abstraction because Friedman has not tried to define it in concrete terms.
8. Saul Hyman has estimated that the long-run Phillips curve is not vertical but is negatively sloped. According to Hyman, the

unemployment rate can be permanently reduced if we are prepared to accept an increase in inflation rate.

4.6. Tobin's View:

James Tobin in his presidential address before the American Economic Association in 1971 proposed a compromise between the negatively sloping and the vertical Phillips curve. Tobin believes that there is a Phillips curve within limits. But as the economy expands and employment grows, the curve becomes even more fragile and vanishes until it becomes vertical at some critically low rate of unemployment. Thus Tobin's Phillips curve is kinked-shaped, a part like a normal Phillips curve and the rest vertical, as shown in Figure 4.7. In the figure, U_c is the critical rate of unemployment at which the Phillips curve becomes vertical where there is no trade-off between unemployment and inflation. According to Tobin, the vertical portion of the curve is not due to increase in the demand for more wages but emerges from imperfections of the labour market.

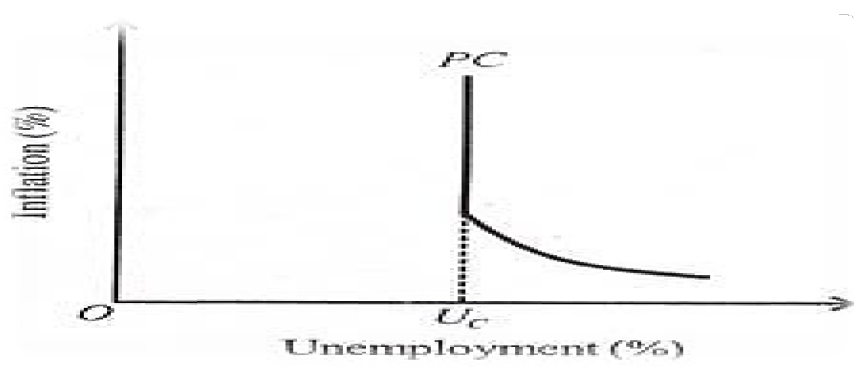


Fig.4.7 Tobin View

At the U_c level, it is not possible to provide more employment because the job seekers have wrong skills or wrong age or sex or are in the wrong place. Regarding the normal portion of the Phillips curve which is negatively sloping, wages are sticky downward because labourers resist a decline in their relative wages. For Tobin, there is a wage-change floor in excess supply situations. In the range of relatively high unemployment to the right of U_c in the figure, as aggregate demand and inflation increase and involuntary unemployment is reduced, wage-floor markets gradually diminish. When all sectors of the labour market are above the wage floor, the level of critically low rate of unemployment U_c is reached.

Conclusion:

The vertical Phillips curve has been accepted by the majority of economists. They agree that at unemployment rate of about 4 per cent, the Phillips curve becomes vertical and the trade-off between unemployment and inflation disappears. It is impossible to reduce unemployment below this level because of market imperfections.

Policy Implications of the Phillips Curve:

The Phillips curve has important policy implications. It 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. For this purpose, it is important to know the exact position of the Phillips curve. While explaining the natural rate of unemployment, Friedman pointed out that the only scope of public policy in influencing the level of unemployment lies in the short run in keeping with the position of the Phillips curve. He ruled out the possibility of influencing the long-run rate of unemployment because of the vertical Phillips curve.

According to him, the trade-off between unemployment and inflation does not exist and has never existed. However rapid the inflation might be, unemployment always tends to fall back to its natural rate which is not some irreducible minimum of unemployment. It can be lowered by removing obstacles in the labour market by reducing frictions. Therefore, public policy should improve the institutional structure to make the labour market responsive to changing patterns of demand. Moreover, some level of unemployment must be accepted as natural because of the existence of large number of part-time workers, unemployment compensation and other institutional factors.

Another implication is that unemployment is not a fitting aim for monetary expansion, according to Friedman. Therefore, employment above the natural rate can be reached at the cost of accelerating inflation, if monetary policy is adopted. In his words, "A little inflation will provide a boost at first—like a small dose of a drug for a new addict—but then it takes more and more inflation to provide the boost, just it takes a bigger and

bigger dose of a drug to give a hardened addict a high.” Thus if the government wants to have a genuine full employment level at the natural rate, it must not use monetary policy to remove institutional restraints, restrictive practices, barriers to mobility, trade union coercion and similar obstacles to both the workers and the employers.

4.7. Causes of Inflation

Inflation is caused when the aggregate demand exceeds the aggregate supply of goods and services. We analyse the factors which lead to increase in demand and the shortage of supply.

Factors Affecting Demand:

Both Keynesians and monetarists believe that inflation is caused by increase in the aggregate demand. They point towards the following factors which raise it.

1. Increase in Money Supply:

Inflation is caused by an increase in the supply of money which leads to increase in aggregate demand. The higher the growth rate of the nominal money supply, the higher is the rate of inflation. Modern quantity theorists do not believe that true inflation starts after the full employment level. This view is realistic because all advanced countries are faced with high levels of unemployment and high rates of inflation.

2. Increase in Disposable Income:

When the disposable income of the people increases, it raises their demand for goods and services. Disposable income may increase with the rise in national income or reduction in taxes or reduction in the saving of the people.

3. Increase in Public Expenditure:

Government activities have been expanding much with the result that government expenditure has also been increasing at a phenomenal rate, thereby raising aggregate demand for goods and services. Governments of both developed and developing countries are providing more facilities under public utilities and social services, and also nationalising industries and starting public enterprises with the result that they help in increasing aggregate demand.

4. Increase in Consumer Spending:

The demand for goods and services increases when consumer expenditure increases. Consumers may spend more due to conspicuous consumption or demonstration effect. They may also spend more when they are given credit facilities to buy goods on hire-purchase and instalment basis.

5. Cheap Monetary Policy:

Cheap monetary policy or the policy of credit expansion also leads to increase in the money supply which raises the demand for goods and services in the economy. When credit expands, it raises the money income of the borrowers which, in turn, raises aggregate demand relative to supply, thereby leading to inflation. This is also known as credit-induced inflation.

6. Deficit Financing:

In order to meet its mounting expenses, the government resorts to deficit financing by borrowing from the public and even by printing more notes. This raises aggregate demand in relation to aggregate supply, thereby leading to inflationary rise in prices. This is also known as deficit-induced inflation.

7. Expansion of the Private Sector:

The expansion of the private sector also tends to raise the aggregate demand. For huge investments increase employment and income, thereby creating more demand for goods and services. But it takes time for the output to enter the market.

8. Black Money:

The existence of black money in all countries due to corruption, tax evasion etc. increases the aggregate demand. People spend such unearned money extravagantly, thereby creating unnecessary demand for commodities. This tends to raise the price level further.

9. Repayment of Public Debt:

Whenever the government repays its past internal debt to the public, it leads to increase in the money supply with the public. This tends to raise the aggregate demand for goods and services.

10. Increase in Exports:

When the demand for domestically produced goods increases in foreign countries, this raises the earnings of industries producing export commodities. These, in turn, create more demand for goods and services within the economy.

Factors Affecting Supply:

There are also certain factors which operate on the opposite side and tend to reduce the aggregate supply. Some of the factors are as follows:

1. Shortage of Factors of Production:

One of the important causes affecting the supplies of goods is the shortage of such factors as labour, raw materials, power supply, capital, etc. They lead to excess capacity and reduction in industrial production.

2. Industrial Disputes:

In countries where trade unions are powerful, they also help in curtailing production. Trade unions resort to strikes and if they happen to be unreasonable from the employers' viewpoint and are prolonged, they force the employers to declare lock-outs. In both cases, industrial production falls, thereby reducing supplies of goods. If the unions succeed in raising money wages of their members to a very high level than the productivity of labour, this also tends to reduce production and supplies of goods.

3. Natural Calamities:

Drought or floods is a factor which adversely affects the supplies of agricultural products. The latter, in turn, create shortages of food products and raw materials, thereby helping inflationary pressures.

4. Artificial Scarcities:

Artificial scarcities are created by hoarders and speculators who indulge in black marketing. Thus they are instrumental in reducing supplies of goods and raising their prices.

5. Increase in Exports:

When the country produces more goods for export than for domestic consumption, this creates shortages of goods in the domestic market. This leads to inflation in the economy.

6. Lop-sided Production:

If the stress is on the production of comforts, luxuries, or basic products to the neglect of essential consumer goods in the country, this creates shortages of consumer goods. This again causes inflation.

7. Law of Diminishing Returns:

If industries in the country are using old machines and outmoded methods of production, the law of diminishing returns operates. This raises cost per unit of production, thereby raising the prices of products.

8. International Factors:

In modern times, inflation is a worldwide phenomenon. When prices rise in major industrial countries, their effects spread to almost all countries with which they have trade relations. Often the rise in the price of a basic raw material like petrol in the international market leads to rise in the price of all related commodities in a country.

4.8. Measures to Control Inflation

We have studied above that inflation is caused by the failure of aggregate supply to equal the increase in aggregate demand. Inflation can, therefore, be controlled by increasing the supplies and reducing money incomes in order to control aggregate demand. The various methods are usually grouped under three heads: Monetary measures, fiscal measures and other measures.

1. Monetary Measures: Monetary measures aim at reducing money incomes.

(a) Credit Control:

One of the important monetary measures is monetary policy. The central bank of the country adopts a number of methods to control the quantity and quality of credit. For this purpose, it raises the bank rates, sells securities in the open market, raises the reserved ratio, and adopts a number of selective credit control measures, such as raising margin requirements and regulating consumer credit. Monetary policy may not be effective in controlling inflation, if inflation is due to cost-push factors. Monetary policy can only be helpful in controlling inflation due to demand-pull factors.

(b) Demonetisation of Currency:

However, one of the monetary measures is to demonetise currency of higher denominations. Such a measure is usually adopted when there is abundance of black money in the country.

(c) Issue of New Currency:

The most extreme monetary measure is the issue of new currency in place of the old currency. Under this system, one new note is exchanged for a number of notes of the old currency. The value of bank deposits is also fixed accordingly. Such a measure is adopted when there is an excessive issue of notes and there is hyperinflation in the country. It is a very effective measure. But is inequitable for it hurts the small depositors the most.

2. Fiscal Measures:

Monetary policy alone is incapable of controlling inflation. It should, therefore, be supplemented by fiscal measures. Fiscal measures are highly effective for controlling government expenditure, personal consumption expenditure, and private and public investment. The principal fiscal measures are the following:

(a) Reduction in Unnecessary Expenditure:

The government should reduce unnecessary expenditure on non-development activities in order to curb inflation. This will also put a check on private expenditure which is dependent upon government demand for goods and services. But it is not easy to cut government expenditure. Though economy measures are always welcome but it becomes difficult to distinguish between essential and non-essential expenditure. Therefore, this measure should be supplemented by taxation.

(b) Increase in Taxes:

To cut personal consumption expenditure, the rates of personal, corporate and commodity taxes should be raised and even new taxes should be levied, but the rates of taxes should not be so high as to discourage saving, investment and production. Rather, the tax system should provide larger incentives to those who save, invest and produce more. Further, to bring more revenue into the tax-net, the government should penalise the tax evaders by imposing heavy fines. Such measures are bound to be effective in

controlling inflation. To increase the supply of goods within the country, the government should reduce import duties and increase export duties.

(c) Increase in Savings:

Another measure is to increase savings on the part of the people. This will tend to reduce disposable income with the people, and hence personal consumption expenditure. But due to the rising cost of living, people are not in a position to save much voluntarily. Keynes, therefore, advocated compulsory savings or what he called 'deferred payment' where the saver gets his money back after some years. For this purpose, the government should float public loans carrying high rates of interest, start saving schemes with prize money, or lottery for long periods, etc. It should also introduce compulsory provident fund, provident fund-cum-pension schemes, etc. compulsorily. All such measures to increase savings are likely to be effective in controlling inflation.

(d) Surplus Budgets:

An important measure is to adopt anti-inflationary budgetary policy. For this purpose, the government should give up deficit financing and instead have surplus budgets. It means collecting more in revenues and spending less.

(e) Public Debt:

At the same time, it should stop repayment of public debt and postpone it to some future date till inflationary pressures are controlled within the economy. Instead, the government should borrow more to reduce money supply with the public. Like the monetary measures, fiscal measures alone cannot help in controlling inflation. They should be supplemented by monetary, non-monetary and non-fiscal measures.

3. Other Measures:

The other types of measures are those which aim at increasing aggregate supply and reducing aggregate demand directly:

(a) To Increase Production:

- One of the foremost measures to control inflation is to increase the production of essential consumer goods like food, clothing, kerosene oil, sugar, vegetable oils, etc.

- If there is need, raw materials for such products may be imported on preferential basis to increase the production of essential commodities.
- Efforts should also be made to increase productivity. For this purpose, industrial peace should be maintained through agreements with trade unions, binding them not to resort to strikes for some time.
- The policy of rationalisation of industries should be adopted as a long-term measure. Rationalisation increases productivity and production of industries through the use of brain, brawn and bullion.
- All possible help in the form of latest technology, raw materials, financial help, subsidies, etc. should be provided to different consumer goods sectors to increase production.

(b) Rational Wage Policy:

Another important measure is to adopt a rational wage and income policy. Under hyperinflation, there is a wage-price spiral. To control this, the government should freeze wages, incomes, profits, dividends, bonus, etc. But such a drastic measure can only be adopted for a short period and by antagonising both workers and industrialists. Therefore, the best course is to link increase in wages to increase in productivity. This will have a dual effect. It will control wages and at the same time increase productivity, and hence increase production of goods in the economy.

(c) Price Control:

Price control and rationing is another measure of direct control to check inflation. Price control means fixing an upper limit for the prices of essential consumer goods. They are the maximum prices fixed by law and anybody charging more than these prices is punished by law. But it is difficult to administer price control.

(d) Rationing:

Rationing aims at distributing consumption of scarce goods so as to make them available to a large number of consumers. It is applied to essential consumer goods such as wheat, rice, sugar, kerosene oil, etc. It is meant to stabilise the prices of necessities and assure distributive justice. But it is very inconvenient for consumers because it leads to queues, artificial shortages, corruption and black marketing. Keynes did not favour

rationing for it “involves a great deal of waste, both of resources and of employment.”

Conclusion:

From the various monetary, fiscal and other measures discussed above, it becomes clear that to control inflation, the government should adopt all measures simultaneously. Inflation is like a hydra-headed monster which should be fought by using all the weapons at the command of the government.

UNIT V

REAL BUSINESS CYCLE THEORY

5.1. Introduction

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

5.2. Source of productivity shocks in Real business cycle Theory

Real Business cycle state that macroeconomic fluctuations in the economy can be largely explained by technological shocks and changes in productivity. The classical model cannot explain the short-run economic fluctuations because in this model prices are flexible. However the new classical economists believe that it is best to assume that prices are flexible even in the short-run. Economic fluctuations is called the theory of real business. Most importantly, real-business-cycle theory holds that the nominal variables are assumed not to influence real variables. To explain fluctuations in real variables, real-business-cycle theory emphasis real changes in the economy, such as changes in fiscal policy and production technologies. The real-business-cycle theory is a new theory of fluctuations which requires the IS-LM model, under the assumption of flexibility of prices.

In the IS-LM model we used the following equations for the goods and money markets:

$$Y = C + (Y - T) + I(r) + G \dots \dots \dots \text{IS}$$

$$M/P = L(r, Y) \dots \dots \dots \text{LM}$$

The first equation is the IS equation, which states that income Y is the sum of C, I, G consumption, depends on disposable income (Y - T) investment

depend on the real interest rate, r , Govt. expenditure, G which is autonomous.

The second equation is the LM equation which states that the supply of real money balances, M/P equals the demand, which is the function of the interest rate and the level of income. It shows the equilibrium of the economy with flexible prices. The level of output is at its natural rate y which is determined by the supply of factors of production and the production function. The interest rate is determined by the intersection of the IS curve and the vertical line y the natural rate of output.

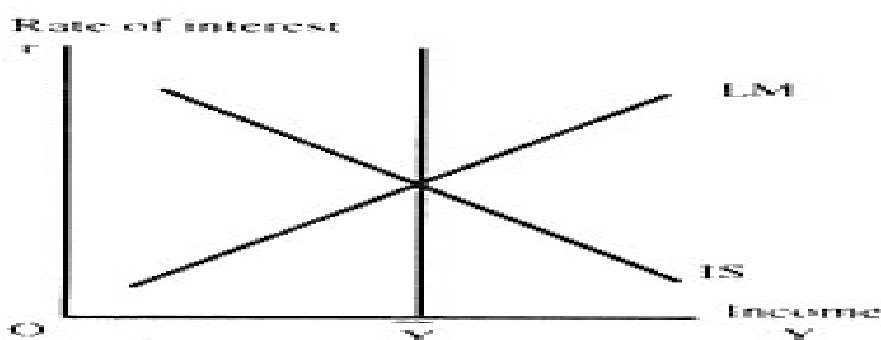


Fig. 5.1. Equilibrium of the Economy with Flexible prices

The price level adjusts, so that the LM curve crosses the intersection of the other two curves. The two key relationships under flexible prices can be shown in Fig 5.1. These two relationships are real aggregate demand and real aggregate supply. The IS curve is called here the real aggregate demand curve, which shows that the demand for goods and services is a function of the interest rate. Real aggregate supply shows the supply of goods and services, which is determined by the supply of factors of production and the availability of technology. The interest rate is on the vertical axis instead of price level as we have already seen in the case of aggregate demand and aggregate supply curves. In business-cycle theory, we are interested in real variables and not nominal variables, so the price level is unimportant. We are now developing a different theory of economic fluctuations.

5.3. Inter-Temporal Substitution of Labour:

Real-business-cycle theory states that the quantity of labour supplied depends on the incentives that workers receive at any point in time. When workers are well rewarded, they wish to work more hours, and vice versa.

This willingness to reallocate hours of work over time is called the inter-temporal substitution of labour. Let W_1 be his real wage in the first wage, and W_2 the real wage he expects in the second wage. Choosing which wage to work means comparing these two wages. Let r be the real interest rate. If he works in the first and saves his earnings, he will have $(1 + r) W_1$ a year later. If he works in the second wage, he will have W_2 . The inter-temporal relative wage is $(1 + r) W_1 / W_2$.

Working in the first wage is more attractive if the interest rate is high or if the wage is high relative to wage expected to prevail in the future. According to real-business-cycle theory, all workers calculate cost-benefit analysis to decide when to work and when to enjoy leisure. If the wage is temporarily high or if the interest rate is high, it is good time to work. If the wage is temporarily low or if the interest rate is low, it is a good time to enjoy leisure. Real-business-cycle theory uses the inter-temporal substitution of labour to explain why employment and output fluctuate. Shocks to the economy that cause the interest rate to rise or the wage rate to be temporarily high cause people to want to work more—which raises employment and output.

Real Aggregate Demand and Real Aggregate Supply:

Real-business-cycle theory incorporates inter-temporal substitution of labour. Our analysis of labour supply shows that the interest rate influences the attractiveness of working today. The higher the interest rate, the greater the amount of labour supplied, and the greater the amount of output produced. Following Fig. shows the real-business-cycle model of the economy. Because of inter-temporal substitution of labour, the real aggregate supply curve slopes upward rather than vertically, which means a higher interest rate makes working more attractive, which increases labour supply and, thus, output. The real interest rate adjusts to equilibrate real aggregate supply and real aggregate demand. We can use this model to explain fluctuations in output.

Any shock to the economy that shifts aggregate demand or aggregate supply changes equilibrium output. Inter-temporal substitution of labour

leads to a corresponding change in the level of employment as well. They view aggregate economic variables as the outcomes of the decisions made by many economic agents acting to maximize their utility subject to production possibilities and resource constraints. Their views mainly relate to technology shocks, labour market, and interest rate, role of money, fiscal policy, prices and wages in business cycles. They are explained below.

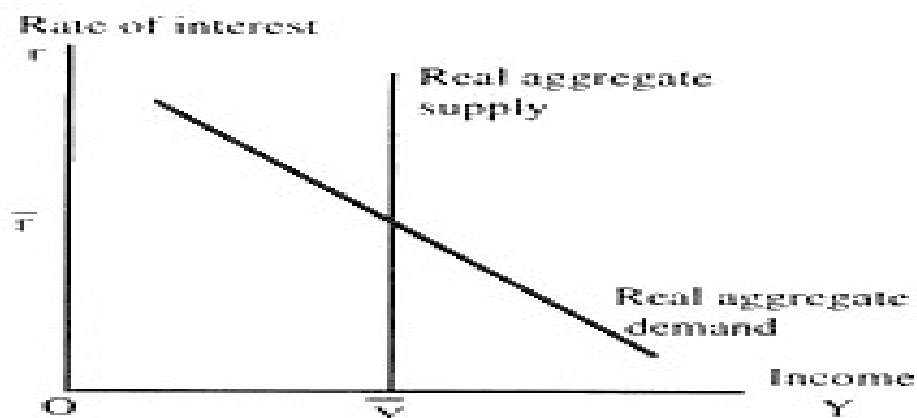


Fig. 5.2. Relationship between the Real Aggregate demand (AD) and Aggregate Supply (AS)

They view aggregate economic variables as the outcomes of the decisions made by many economic agents acting to maximize their utility subject to production possibilities and resource constraints. Their views mainly relate to technology shocks, labour market, and interest rate, role of money, fiscal policy, prices and wages in business cycles. They are explained below.

5.4. Role of Technological Shocks:

The theory of real business cycles explains short-run economic fluctuations based on the assumptions of the classical theory. They are primarily caused by real or supply side shocks that involve exogenous large random changes in technology. An initial shock in the form of a technological advance shifts the production function upward. This leads to increase in available resources, investment, consumption and real output.

Assumptions:

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

1. There is a single commodity in the economy.
2. Prices and wages are flexible.
3. Money supply and price level do not influence real variables such as output and employment.
4. Fluctuations in employment are voluntary.
5. Population is given. So there is fixed labour force.
6. There are rational identical economic agents in the economy.
7. It is a single sector economy.
8. There are substantial changes in the rate of technology that affect the whole economy (which is viewed as a single sector).
9. There is constant return to scale production-technology.
10. The economy is in a steady state.

Technological Shock:

Given these assumptions, the production function of the economy is given by $Y = Zf(K, N)$

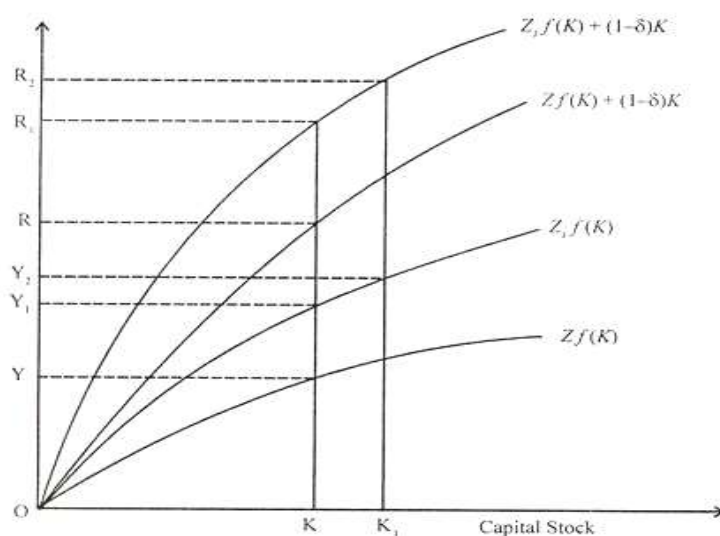


Fig. 5.3. Technological shocks

Where Y is total output, Z is the state of technology, K is predetermined capital stock and N is labour input. The produced output can either be consumed or invested. Assuming that population is given and there is a fixed labour force, output depends on technology and capital stock. So output is determined by the production function, $Y = Zf(K)$. The capital stock, K depreciates at the rate S , so that the undepreciated capital

stock evolves as $(1-s) K$. This capital stock is available as input for production in the next period.

With a capital stock K , output is Y and the total resources available in the economy in the current period are $Y + (1-s) K$. Since $Y = Zf(K)$, the total resources can be expressed as $Zf(K) + (1-s) K$. These resources can either be consumed or accumulated as capital to be used as investment for the next period. A real business cycle is generated in a steady state economy when there is a positive exogenous and permanent technological shock. This leads to increase in productivity. As a result, the aggregate production function shifts upward. The improvement in technology from the initial level Z to Z_1 and the consequent upward shift of the production function from $Zf(K)$ to $Z_1f(K)$ is shown in Figure 5.3. Given the initial capital stock OK , output increases from OY to OY_1 .

As a result, total resources increase from OR to OR_1 and the total resources curve shifts upward from $Zf(K)+(1-s) K$ to $Z_1f(K)+(1-s)K$. With the increase in total resources, both current consumption and capital accumulation also increase. There is increase in capital stock to OK_1 . With no change in technology, the increase in capital stock to K_1 in the next period leads to a further rise in output to OY_2 and the increase in total resources to OR_1 . In this way, the economy continues to expand when consumption, investment and output increase gradually leading to a new steady state.

Labour Market:

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

Interest Rate:

Business cycle theory also takes into account the role of real interest rate in response to a technological shock. The real interest is equal to the

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

Flexibility of Wages and Prices:

The real business cycle theory assumes that wages and prices are flexible. They adjust quickly to clear the markets. There are no market imperfections. It is the “invisible hand” that clears the market and leads to an optimal allocation of resources in the economy.

Neutrality of Money:

Money plays no role in the real business cycle theory. Money is neutral. It is a veil. Money does not affect such real variables as employment and output. The role of money is to determine the price level. The money supply is endogenous in the real business cycle theory. It is fluctuations in output that cause fluctuations in the money supply. For instance, when there is a favourable technological change, the output increases and the quantity of money demanded rises. The banking system responds by advancing more loans and the central bank increases the money supply. With the money supply increasing, prices rise.

Fiscal Policy:

Fiscal policy has little role to play in the real business cycle theory. Since the “invisible hand” guides the economy, the government role is limited. In fact, business cycles are the natural and efficient response of the economy to favourable and unfavourable technological shocks. A fiscal policy measure such as a tax on income will adversely affect output and employment. An individual may choose more leisure to work leading to reduction in consumption, investment and output. To avoid tax distortions and meet its requirements, the central bank increases the money supply in the economy. So the government has no role in stabilisation policy.

Criticisms of the Real Business Cycle Theory:

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

1. Technological Shocks:

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

2. Other Factors:

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

3. Intertemporal Substitution:

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

4. Voluntary Employment:

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

5. Exchange Mechanism:

According to Summers, a fundamental objection of Prescott's real business theory is that it ignores breakdown of the exchange mechanism during depressions in cyclical fluctuations.

6. Neutrality of Money:

The real business cycle theory assumes neutrality of money. But according to critics, the empirical evidence does not support that money is neutral in the short run. They point out that money does affect such real variables as output and employment in a boom and a recession. When there is increase in money growth and inflation, output and employment are high in a boom, and vice versa in a recession.

7. Wages and Prices:

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

8. Fiscal Policy:

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

9. Negative Technological Shocks:

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

10. Incomplete Theory:

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