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**MA (ECONOMICS)
SEMESTER - I
REVISED SYLLABUS AS PER NEP 2020

MACROECONOMICS - I**

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SYLLABUS

Module 1: National Income and Social Accounting (15 Hours)

National Income Accounting Concepts, Circular flow, accounting identities, Inflation and price indices. Social accounting- Concepts, Features, and types of social accounts, National income and Product accounts, Input-output accounting, and Flow of funds accounts.

Module 2: Consumption Expenditure and Investment Analysis (15 Hours)

Absolute income hypothesis; Relative income hypothesis; Permanent income hypothesis; and Life-cycle hypothesis. Investment-Types of Investment- Determinants of Investment -Marginal efficiency of capital (MEC)-Supply price of capital (SP), Prospective yield of capital (PY)

Module 3: Inflation and Trade Cycles (15 Hours)

Theories of Inflation: Demand-pull and Cost-push, Keynesian Theory, Inflation and GDP, Inflation and interest rates - Trade cycles, Anti cyclical policy, Theories of Trade Cycles - Hicks, Schumpeter, Goodwin, and Samuelson.

Module 4: Supply and Demand for Money (15 Hours)

Components of money supply; Measures of money supply: M1, M2, M3, and M4- Determinants of Money Supply- Classical approach, Cambridge approach, Keynesian approach, Liquidity preference theory, Portfolio theories of money demand - Portfolio balance Approach: Baumol and Tobin, Milton Friedman's Approach.

References:

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MODULE 1

NATIONAL INCOME AND SOCIAL ACCOUNTING

Unit Structure:

- 1.0 Objectives
- 1.1 Overview
- 1.2 Concepts of National Income Accounting
- 1.3 Accounting Identities
- 1.4 Inflation and Price Indices
- 1.5 Need for National Income Accounting
- 1.6 Questions
- 1.7 References

1.0 OBJECTIVES

- To explain the explanation to Concepts of National Income Accounting.
- To familiar with Accounting Identities.
- To explain the overview of Inflation and Price Indices.

1.1 UNIT OVERVIEW

This unit provides an explanation to National Income Accounting. The unit explains. The unit then provides an overview of Concepts of National Income, Accounting Identities and Inflation and Price Indices.

1.2 NATIONAL INCOME

National income of India constitutes total amount of income earned by the whole nation of our country and originated both within and outside its territory during a particular year. The National Income Committee in its first report wrote, “A national income estimate measures the volume of commodities and services turned out during a given period, without duplication”. The estimates of national income depict a clear picture about the standard of living of the community. The national income statistics diagnose the economic ills of the country and at the same time suggest remedies. The rate of savings and investment in an economy also depends on the national income of the country. Moreover, the national income measures the flow of all commodities and services produced in an economy. Thus the national income is not a stock but a flow. Further, the National Income Committee has rightly observed, “National income statistics enable an overall view to be taken of the whole economy and of the relative

positions and inter-relations among its various parts". During the British period, several estimates of national income were made by Dadabhai Naoroji (1868), William Digby (1899), Findlay Shirras (1911, 1922 and 1934), Shah and Khambatta (1921), V.K.R.V. Rao (1925-29) and R.C. Desai (1931-40). Among all these pre-independence estimates of national income in India, the estimates of Naoroji, Findlay Shirras and Shaw and Khambatta have computed the value of the output raised by the agricultural sector and then added some portion of the income earned by the non-agricultural sector. But these estimates were having no scientific basis of its own. After that Dr. V.K.R.V. Rao applied a combination of census of output and census of income methods. While dividing the whole economy into two separate categories he included agriculture, pastures, forests, fishing, hunting and mines in the first category and applied output method to derive the value of output of these sectors. The other activities like industry, trade, transport, administrative and public services, professions, liberal arts and domestic services were included in second category and applied income method to derive the amount of income raised from all these services. He also added income from house property and other internal incomes along-with the total income earned from abroad to these two sub-totals mentioned above. Although pre-independence estimates of national income in India suffered from various difficulties and limitations but it provided considerable light and insight about the economic conditions of the country prevailing during those periods.

After independence, the Government of India appointed the National Income Committee in August, 1949 with Prof. P.C. Mahalanobis as its chairman and Prof. D.R. Gadgil and Dr. V.K.R.V. Rao as its two members so as to compile a national income estimates rationally on scientific basis. The first report of this committee was prepared in 1951. In its report, the total national income of the year 1948-49 was estimated at Rs. 8,830 crore and the per capita income of the year was calculated at Rs. 265 per annum. The committee continued its estimation works for another three years and the final report was published in 1954. For the estimation of national income in India the National Income Committee applied a mixture of both 'Product Method' and the 'Income Method'. This Committee divided the entire economy into 13 sectors. Income from the six sectors, viz., agriculture, animal husbandry, forestry, Fishery, mining, and factory establishments was estimated by the output method. But the income from the remaining seven sectors consisting of small enterprises, commerce, transport and communications, banking and insurance, professions, liberal arts, domestic services, house property, public authorities and rest of the world was estimated by the income methods.

During the post-independence period, the estimate of national income was primarily conducted by the National Income Committee. Later on, it was carried over by the Central Statistical Organisation. The National Income Unit of C.S.O. estimated the major part of national income from the various sectors like agriculture, forestry, animal husbandry, fishing, mining, and factory establishments with the help of product method. The unit of C.S.O. is also applying the income method for the estimation of the remaining part of national income raised from the other sectors.

National income is the sum total of the value of all the goods and services manufactured by the residents of the country, in a year., within its domestic boundaries or outside. It is the net amount of income of the citizens by production in a year.

To be more precise, national income is the accumulated money value of all final goods and services produced in a country during one financial year. Computation of National Income is very vital as it indicates the overall health of our economy for that particular year.

The aggregate economic performance of a nation is calculated with the help of National income data. The basic purpose of national income is to throw light on aggregate output and income and provide a basis for the government to formulate its policy, programs, to maximize the national welfare of the people. Central Statistical Organization calculates the national income in India.

1.2.1 Importance of National Income:

1. Setting Economic Policy:

National Income indicates the status of the economy and can give a clear picture of the country's economic growth. National Income statistics can help economists in formulating economic policies for economic development.

2. Inflation and Deflationary Gaps:

For timely anti-inflationary and deflationary policies, we need aggregate data of national income. If expenditure increases from the total output, it shows inflammatory gaps and vice versa.

3. Budget Preparation:

The budget of the country is highly dependent on the net national income and its concepts. The Government formulates the yearly budget with the help of national income statistics in order to avoid any cynical policies.

4. Standard of Living:

National income data assists the government in comparing the standard of living amongst countries and people living in the same country at different times.

5. Defense and Development:

National income estimates help us to bifurcate the national product between defense and development purposes of the country. From such figures, we can easily know, how much can be set aside for the defense budget.

1.2.2 Concepts of National Income:

National income is the money value of all goods and services produced by a country during a period of one year. National income consists of a collection of different types of goods and services of different types.

The main concepts of National Income are: GDP, GNP, NNP, NI, PI, DI, and PCI. These different concepts explain about the phenomenon of economic activities of the various sectors of the economy.

(A) Gross Domestic Product (GDP):

The most important concept of national income is Gross Domestic Product. Gross domestic product is the money value of all final goods and services produced within the domestic territory of a country during a year. GDP is the total value of goods and services produced within the country during a year. This is calculated at market prices and is known as GDP at market prices.

Dernberg defines GDP at market price as “the market value of the output of final goods and services produced in the domestic territory of a country during an accounting year.”

I) There are three different ways to measure GDP:

Product Method, Income Method and Expenditure Method.

These three methods of calculating GDP yield the same result because National Product = National Income = National Expenditure.

1. The Product Method:

In this method, the value of all goods and services produced in different industries during the year is added up. This is also known as the value added method to GDP or GDP at factor cost by industry of origin. The following items are included in India in this: agriculture and allied services; mining; manufacturing, construction, electricity, gas and water supply; transport, communication and trade; banking and insurance, real estates and ownership of dwellings and business services; and public administration and defense and other services (or government services). In other words, it is the sum of gross value added.

2. The Income Method:

The people of a country who produce GDP during a year receive incomes from their work. Thus, GDP by income method is the sum of all factor incomes: Wages and Salaries (compensation of employees) + Rent + Interest + Profit.

3. Expenditure Method:

This method focuses on goods and services produced within the country during one year.

GDP by expenditure method includes:

- (1) Consumer expenditure on services and durable and non-durable goods (C),

- (2) Investment in fixed capital such as residential and non-residential building, machinery, and inventories (I),
- (3) Government expenditure on final goods and services (G),
- (4) Export of goods and services produced by the people of country (X),
- (5) Less imports (M). That part of consumption, investment and government expenditure which is spent on imports is subtracted from GDP. Similarly, any imported component, such as raw materials, which is used in the manufacture of export goods, is also excluded.

Thus, GDP by expenditure method at market prices = $C + I + G + (X - M)$, where $(X - M)$ is net export which can be positive or negative.

II) GDP at Factor Cost:

GDP at factor cost is the sum of net value added by all producers within the country. Since the net value added gets distributed as income to the owners of factors of production, GDP is the sum of domestic factor incomes and fixed capital consumption (or depreciation).

Thus, GDP at Factor Cost = Net value added + Depreciation.

GDP at factor cost includes:

- (i) Compensation of employees i.e., wages, salaries, etc.
- (ii) Operating surplus which is the business profit of both incorporated and unincorporated firms. [Operating Surplus = Gross Value Added at Factor Cost—Compensation of Employees—Depreciation]
- (iii) Mixed Income of Self- employed.

Conceptually, GDP at factor cost and GDP at market price must be identical/This is because the factor cost (payments to factors) of producing goods must equal the final value of goods and services at market prices. However, the market value of goods and services is different from the earnings of the factors of production.

In GDP at market price are included indirect taxes and are excluded subsidies by the government. Therefore, in order to arrive at GDP at factor cost, indirect taxes are subtracted and subsidies are added to GDP at market price.

Thus, GDP at Factor Cost = GDP at Market Price – Indirect Taxes + Subsidies.

(III) Net Domestic Product (NDP):

NDP is the value of net output of the economy during the year. Some of the country's capital equipment wears out or becomes obsolete each year during

the production process. The value of this capital consumption is some percentage of gross investment which is deducted from GDP.

Thus, Net Domestic Product = GDP at Factor Cost – Depreciation.

(IV) Nominal and Real GDP:

When GDP is measured on the basis of current price, it is called GDP at current prices or nominal GDP. On the other hand, when GDP is calculated on the basis of fixed prices in some year, it is called GDP at constant prices or real GDP.

Real GDP On the other hand real GDP is the value calculated using a constant set of prices. By affixing a base year for these constant prices, value of the GDP can be calculated to ascertain the scale of change in the production levels.

Nominal GDP is the value of goods and services produced in a year and measured in terms of rupees (money) at current (market) prices. In comparing one year with another, we are faced with the problem that the rupee is not a stable measure of purchasing power. GDP may rise a great deal in a year, not because the economy has been growing rapidly but because of rise in prices (or inflation). On the contrary, GDP may increase as a result of fall in prices in a year but actually it may be less as compared to the last year.

GDP does not show the real state of the economy. To rectify the underestimation and overestimation of GDP, we need a measure that adjusts for rising and falling prices. This can be done by measuring GDP at constant prices which is called real GDP. To find out the real GDP, a base year is chosen when the general price level is normal, i.e., it is neither too high nor too low.

(V) GDP deflator:

The change in prices is calculated by an index of prices called the GDP deflator, which is nothing but the ratio of the nominal GDP to the real GDP. i.e., $\text{GDP Deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}}$ Suppose an economy produces only one good X, such that in the year 2008, there were 200 units of X produced at the price of Rs 10 per unit. Hence, the GDP at current prices was Rs 2000 (= 200 x 10). In 2013 the economy produced 220 units of good X at the price of Rs 15 per unit. Therefore, nominal GDP in the year 2013 is Rs 3300 (= 220 x 15). Now suppose we fix 2008 as the base year. The real GDP in the year 2013 calculated at the price of the base year 2008 will be Rs 2200 (= 220 x 10). In the calculation of real and nominal GDP in the current year 2013, we have kept the quantity of production constant. Therefore, if there is any difference in the two figures, it must be on account of a change in price from the base year to the current year. According to the formula mentioned above, we know the GDP deflator, ratio of the nominal GDP (Rs 3300) to the real GDP (Rs 2200), is 1.5. Hence, the prices have increased by 1.5 times from the base year to the current year. In percentage terms this is 150.

(VI) Potential GDP:

The Potential GDP measures/estimates the highest level of output that an economy can sustain over a period of time at a constant inflation rate. The GDP gap depicts the difference between potential GDP and real GDP.

The factors that affect/determine potential GDP can be:

1. Sustainability
2. Full employment (gender inequality, unemployment)
3. Technological usage
4. Regulatory framework
5. Steady currency

(VII) Green GDP:

- Green Gross Domestic Product is the index of the Economic growth of a particular country which enshrines the environmental consequences of the economic growth.
- Simply put, Green GDP is conventional gross domestic product figures adjusted for the environmental costs of economic activities. It's a measure of how a country is prepared for sustainable economic development.
- It accounts for the monetized loss of biodiversity and costs caused by climate change.
- The System of National Accounts (SNA) is an accounting framework for measuring the economic activities of production, consumption and accumulation of wealth in an economy during a period of time. When information on economy's use of the natural environment is integrated into the system of national accounts, it becomes green national accounts or environmental accounting.

Steps of environmental accounting:

The process of environmental accounting involves three steps viz. Physical accounting; Monetary valuation; and integration with national Income/wealth Accounts.

- Physical accounting determines the state of the resources, types, and extent (qualitative and quantitative) in spatial and temporal terms.
- Monetary valuation is done to determine its tangible and intangible components.
- Thereafter, the net change in natural resources in monetary terms is integrated into the Gross Domestic Product in order to reach the value of Green GDP. The process envisaged by Ministry of Environment and Forest does not require any change in the core System of National Accounts (SNA), and is achieved by establishing linkages between the two through a system of satellite accounts (called Satellite accounts as it adds new information to core accounts).

For example, Environmental Satellite Accounts link measures of emissions, material use, costs of remediation and environmental taxes to measures of economic activity. Satellite accounts are a framework that enables attention to be focused on a certain field or aspect of economic and social life. They are produced in the context of national accounts but are more flexible as they allow concepts, definitions, accounting rules and classifications to be changed, where it improves analysis.

Green GDP is calculated by subtracting net natural capital consumption from the standard GDP. This includes resource depletion, environmental degradation, and protective environmental initiatives. These calculations can alternatively be applied to the net domestic product (NDP), which subtracts the depreciation of capital from GDP. In every case, it is required to convert any resource extraction activity into a monetary value since they are expressed in this manner through national accounts.

(VIII) Importance of GDP:

- (i) Study of economic growth:** The GDP has not only a theoretic importance but also practical importance. Harris is of the opinion that the study of national income can be split up into two parts, one for the long term analysis and the other for short term study. If GDP increases over years, it shows that we are heading towards prosperity and if it is stagnant or is falling, it indicates that the economy is declining.
- (ii) Unequal distribution of wealth:** The GDP throws light on the earnings of the various factors of production and the total output of the country. If the output is less and there is unequal distribution of wealth, the economist can suggest measures to increase output and to bridge the income gap between the rich and the poor.
- (iii) Problems of inflation and deflation:** The GDP statistics can help the economists a lot in solving the problems of inflation in the country.
- (iv) The share of government in economic progress:** In a centrally controlled economy, all the factors of production are awarded and are fully controlled by the state. In a mixed economy, the state as well as the people in cooperation with each other can take part in the economic advancement of the country, GDP shows the role which state is playing for the economic progress of the people.
- (v) Comparison with developed countries of the world:** The GDP figures help us to know the economic position of the people of the various countries. If the standard of living of the people in one country is low, they can take measures to increase the standard of living of the people.
- (vi) Estimate of the purchasing power:** The importance of the GDP can also be judged from the fact that it throws light in the purchasing power of the people, their power to save and the ability to pay taxes to the government.

- (vii) **Guide to economic planning:** The GDP figure is very helpful for the government to frame short- and long-term economic policies according to the prevailing conditions in the country
- (viii) **Economy's structure:** The GDP indicates the share of various sectors to the economy. If in a particular sector, the share is less and it is desired to be raised, then steps can be taken to increase it. GDP thus gives us a clear idea about the structure of the economy.
- (ix) **Public Sector:** GDP studies help us to know the relative roles of public and private sector in the economy.

(IX) GDP and Welfare:

GDP is a measure of the economic prosperity of a country compiled as output or income. There is a strong correlation between the development in GDP and changes in several important social factors, including tax payments and unemployment and, to a lesser extent, health and education. However, GDP is regularly criticised for not presenting a fair view of welfare. If GDP is a poor measure of welfare, focusing one-sidedly on increasing GDP may lead to misguided political decisions

(X) Criticism of GDP:

The first criticism is that GDP is hopelessly flawed as a measure of human welfare. For example, the argument goes, it takes no account of pollution.

- GDP has always been a measure of output, not of welfare. Using current prices, it measures the value of goods and services produced for final consumption, private and public, present, and future. But GDP can be considered a component of welfare.
- The second criticism is that GDP ignores distribution. In a rich country like the US, some say, the typical person or family has seen little or no benefit from growth since the 1970s. At the same time, inequality has risen sharply.
- The third criticism is that above a certain level, a higher material standard of living does not make people happier. This view concludes that we should

(B) Gross National Product (GNP):

In Gross National Product, we change residents to “citizens”. This means that any economic contribution of foreign citizens in India is to be removed from calculation of GNP and economic contribution of Indian citizens abroad is to be added in calculation of GNP. The difference between the national and domestic product is the net factor income from abroad (NFIA). As the name suggests, factor income from abroad refers to the remuneration earned by various factors in a foreign country. For instance, if the Indian residents provide labour service abroad or own an equity in a firm abroad or even lend capital to companies abroad, they would be earning wages and salaries, profits and interest respectively, in return. All of these comprise

the factor incomes from abroad. Conversely, foreign nationals in India earn factor incomes (wages, salaries, profits and interest) here. Thus, the excess of factor incomes earned by the Indian nationals abroad over the factor income paid to the foreign nationals in India is called the net factor income from abroad.

GNP is the total measure of the flow of goods and services at market value resulting from current production during a year in a country, including net income from abroad.

GNP includes four types of final goods and services:

- (1) Consumers' goods and services to satisfy the immediate wants of the people;
- (2) Gross private domestic investment in capital goods consisting of fixed capital formation, residential construction, and inventories of finished and unfinished goods;
- (3) Goods and services produced by the government; and
- (4) Net exports of goods and services, i.e., the difference between value of exports and imports of goods and services, known as net income from abroad.

In this concept of GNP, there are certain factors that have to be taken into consideration: First, GNP is the measure of money, in which all kinds of goods and services produced in a country during one year are measured in terms of money at current prices and then added together.

But in this manner, due to an increase or decrease in the prices, the GNP shows a rise or decline, which may not be real. To guard against erring on this account, a particular year (say for instance 1990-91) when prices be normal, is taken as the base year and the GNP is adjusted in accordance with the index number for that year. This will be known as GNP at 1990-91 prices or at constant prices.

Second, in estimating GNP of the economy, the market price of only the final products should be taken into account. Many of the products pass through a number of stages before they are ultimately purchased by consumers.

If those products were counted at every stage, they would be included many a time in the national product. Consequently, the GNP would increase too much. To avoid double counting, therefore, only the final products and not the intermediary goods should be taken into account.

Third, goods and services rendered free of charge are not included in the GNP, because it is not possible to have a correct estimate of their market price. For example, the bringing up of a child by the mother, imparting instructions to his son by a teacher, recitals to his friends by a musician, etc.

Fourth, the transactions which do not arise from the produce of current year or which do not contribute in any way to production are not included in the GNP. The sale and purchase of old goods, and of shares, bonds and assets of existing companies are not included in GNP because these do not make any addition to the national product, and the goods are simply transferred.

Fifth, the payments received under social security, e.g., unemployment insurance allowance, old age pension, and interest on public loans are also not included in GNP, because the recipients do not provide any service in lieu of them. But the depreciation of machines, plants and other capital goods is not deducted from GNP.

Sixth, the profits earned or losses incurred on account of changes in capital assets as a result of fluctuations in market prices are not included in the GNP if they are not responsible for current production or economic activity.

For example, if the price of a house or a piece of land increases due to inflation, the profit earned by selling it will not be a part of GNP. But if, during the current year, a portion of a house is constructed anew, the increase in the value of the house (after subtracting the cost of the newly constructed portion) will be included in the GNP. Similarly, variations in the value of assets, that can be ascertained beforehand and are insured against flood or fire, are not included in the GNP.

Last, the income earned through illegal activities is not included in the GNP. Although the goods sold in the black market are priced and fulfill the needs of the people, but as they are not useful from the social point of view, the income received from their sale and purchase is always excluded from the GNP.

There are two main reasons for this. One, it is not known whether these things were produced during the current year or the preceding years. Two, many of these goods are foreign made and smuggled and hence not included in the GNP.

(I) Three Approaches to GNP:

After having studied the fundamental constituents of GNP, it is essential to know how it is estimated. Three approaches are employed for this purpose. One, the income method to GNP; two, the expenditure method to GNP and three, the value added method to GNP. Since gross income equals gross expenditure, GNP estimated by all these methods would be the same with appropriate adjustments.

1. Income Method to GNP:

The income method to GNP consists of the remuneration paid in terms of money to the factors of production annually in a country.

Thus GNP is the sum total of the following items:

- (i) Wages and salaries:** Under this head are included all forms of wages and salaries earned through productive activities by workers and

entrepreneurs. It includes all sums received or deposited during a year by way of all types of contributions like overtime, commission, provident fund, insurance, etc.

- (ii) **Rents:** Total rent includes the rents of land, shop, house, factory, etc. and the estimated rents of all such assets as are used by the owners themselves.
- (iii) **Interest:** Under interest comes the income by way of interest received by the individual of a country from different sources. To this is added, the estimated interest on that private capital which is invested and not borrowed by the businessman in his personal business. But the interest received on governmental loans has to be excluded, because it is a mere transfer of national income.
- (iv) **Dividends:** Dividends earned by the shareholders from companies are included in the GNP.
- (v) **Undistributed corporate profits:** Profits which are not distributed by companies and are retained by them are included in the GNP.
- (vi) **Mixed incomes:** These include profits of unincorporated business, self-employed persons and partnerships. They form part of GNP.
- (vii) **Direct taxes:** Taxes levied on individuals, corporations and other businesses are included in the GNP.
- (viii) **Indirect taxes:** The government levies a number of indirect taxes, like excise duties and sales tax. These taxes are included in the price of commodities. But revenue from these goes to the government treasury and not to the factors of production. Therefore, the income due to such taxes is added to the GNP.
- (ix) **Depreciation:** Every corporation makes allowance for expenditure on wearing out and depreciation of machines, plants and other capital equipment. Since this sum also is not a part of the income received by the factors of production, it is, therefore, also included in the GNP.
- (x) **Net income earned from abroad:** This is the difference between the value of exports of goods and services and the value of imports of goods and services. If this difference is positive, it is added to the GNP and if it is negative, it is deducted from the GNP.

Thus, GNP according to the Income Method = Wages and Salaries + Rents + Interest + Dividends + Undistributed Corporate Profits + Mixed Income + Direct Taxes + Indirect Taxes + Depreciation + Net Income from abroad.

2. Expenditure Method to GNP:

From the expenditure view point, GNP is the sum total of expenditure incurred on goods and services during one year in a country.

It includes the following items:

- (i) **Private consumption expenditure:** It includes all types of expenditure on personal consumption by the individuals of a country. It comprises expenses on durable goods like watch, bicycle, radio, etc., expenditure on single-used consumers' goods like milk, bread, ghee, clothes, etc., as also the expenditure incurred on services of all kinds like fees for school, doctor, lawyer and transport. All these are taken as final goods.
- (ii) **Gross domestic private investment:** Under this comes the expenditure incurred by private enterprise on new investment and on replacement of old capital. It includes expenditure on house construction, factory- buildings, and all types of machinery, plants and capital equipment.

In particular, the increase or decrease in inventory is added to or subtracted from it. The inventory includes produced but unsold manufactured and semi-manufactured goods during the year and the stocks of raw materials, which have to be accounted for in GNP. It does not take into account the financial exchange of shares and stocks because their sale and purchase is not real investment. But depreciation is added.

- (iii) **Net foreign investment:** It means the difference between exports and imports or export surplus. Every country exports to or imports from certain foreign countries. The imported goods are not produced within the country and hence cannot be included in national income, but the exported goods are manufactured within the country. Therefore, the difference of value between exports (X) and imports (M), whether positive or negative, is included in the GNP.
- (iv) **Government expenditure on goods and services:** The expenditure incurred by the government on goods and services is a part of the GNP. Central, state or local governments spend a lot on their employees, police and army. To run the offices, the governments have also to spend on contingencies which include paper, pen, pencil and various types of stationery, cloth, furniture, cars, etc.

It also includes the expenditure on government enterprises. But expenditure on transfer payments is not added, because these payments are not made in exchange for goods and services produced during the current year.

Thus GNP according to the Expenditure Method = Private Consumption Expenditure (C) + Gross Domestic Private Investment (I) + Net Foreign Investment (X-M) + Government Expenditure on Goods and Services (G) = $C + I + (X - M) + G$.

As already pointed out above, GNP estimated by either the income or the expenditure method would work out to be the same, if all the items are correctly calculated.

3. Value Added Method to GNP:

Another method of measuring GNP is by value added. In calculating GNP, the money value of final goods and services produced at current prices during a year is taken into account. This is one of the ways to avoid double counting. But it is difficult to distinguish properly between a final product and an intermediate product.

For instance, raw materials, semi-finished products, fuels and services, etc. are sold as inputs by one industry to the other. They may be final goods for one industry and intermediate for others. So, to avoid duplication, the value of intermediate products used in manufacturing final products must be subtracted from the value of total output of each industry in the economy.

Thus, the difference between the value of material outputs and inputs at each stage of production is called the value added. If all such differences are added up for all industries in the economy, we arrive at the GNP by value added. $\text{GNP by value added} = \text{Gross value added} + \text{net income from abroad}$.

(III) GNP at Market Prices:

When we multiply the total output produced in one year by their market prices prevalent during that year in a country, we get the Gross National Product at market prices. Thus GNP at market prices means the gross value of final goods and services produced annually in a country plus net income from abroad. It includes the gross value of output of all items from (1) to (4) mentioned under GNP. $\text{GNP at Market Prices} = \text{GDP at Market Prices} + \text{Net Income from Abroad}$.

(IV) GNP at Factor Cost:

GNP at factor cost is the sum of the money value of the income produced by and accruing to the various factors of production in one year in a country. It includes all items mentioned above under income method to GNP less indirect taxes.

GNP at market prices always includes indirect taxes levied by the government on goods which raise their prices. But GNP at factor cost is the income which the factors of production receive in return for their services alone. It is the cost of production.

Thus GNP at market prices is always higher than GNP at factor cost. Therefore, in order to arrive at GNP at factor cost, we deduct indirect taxes from GNP at market prices. Again, it often happens that the cost of production of a commodity to the producer is higher than a price of a similar commodity in the market.

In order to protect such producers, the government helps them by granting monetary help in the form of a subsidy equal to the difference between the market price and the cost of production of the commodity. As a result, the

price of the commodity to the producer is reduced and equals the market price of similar commodity.

For example if the market price of rice is Rs. 3 per kg but it costs the producers in certain areas Rs. 3.50. The government gives a subsidy of 50 paise per kg to them in order to meet their cost of production. Thus in order to arrive at GNP at factor cost, subsidies are added to GNP at market prices.

GNP at Factor Cost = GNP at Market Prices – Indirect Taxes + Subsidies.

(C) Net National Product (NNP):

NNP is calculated as GNP minus depreciation. In the course of production, the fixed capital (plants and machinery) undergoes routine wear and tear which signifies the extent of consumption of fixed capital. Additionally, over time the machinery tends to become out dated or obsolete, even if perfect in the working condition. To avoid over estimating the national product, we create a provision for this wear and tear or depreciation as well as the routine obsolescence.

NNP = GNP – depreciation

NNP includes the value of total output of consumption goods and investment goods. But the process of production uses up a certain amount of fixed capital. Some fixed equipment wears out, its other components are damaged or destroyed, and still others are rendered obsolete through technological changes.

All this process is termed depreciation or capital consumption allowance. In order to arrive at NNP, we deduct depreciation from GNP. The word ‘net’ refers to the exclusion of that part of total output which represents depreciation.

So NNP = GNP—Depreciation.

(I) NNP at Market Prices:

Net National Product at market prices is the net value of final goods and services evaluated at market prices in the course of one year in a country. If we deduct depreciation from GNP at market prices, we get NNP at market prices. So NNP at Market Prices = GNP at Market Prices—Depreciation.

(II) NNP at Factor Cost:

Net National Product at factor cost is the net output evaluated at factor prices. It includes income earned by factors of production through participation in the production process such as wages and salaries, rents, profits, etc. It is also called National Income. This measure differs from NNP at market prices in that indirect taxes are deducted and subsidies are added to NNP at market prices in order to arrive at NNP at factor cost. Thus

NNP at Factor Cost = NNP at Market Prices – Indirect taxes+ Subsidies

Normally, NNP at market prices is higher than NNP at factor cost because indirect taxes exceed government subsidies. However, NNP at market prices can be less than NNP at factor cost when government subsidies exceed indirect taxes.

(D) Domestic Income:

Income generated (or earned) by factors of production within the country from its own resources is called domestic income or domestic product.

Domestic income includes:

(i) Wages and salaries, (ii) rents, including imputed house rents, (iii) interest, (iv) dividends, (v) undistributed corporate profits, including surpluses of public undertakings, (vi) mixed incomes consisting of profits of unincorporated firms, self-employed persons, partnerships, etc., and (vii) direct taxes.

Since domestic income does not include income earned from abroad, it can also be shown as: Domestic Income = National Income - Net income earned from abroad. Thus the difference between domestic income and national income is the net income earned from abroad. If we add net income from abroad to domestic income, we get national income,

i.e., National Income = Domestic Income + Net income earned from abroad.

But the net national income earned from abroad may be positive or negative. If exports exceed imports, net income earned from abroad is positive. In this case, national income is greater than domestic income. On the other hand, when imports exceed exports, net income earned from abroad is negative and domestic income is greater than national income.

(E) Private Income:

Private income is income obtained by private individuals from any source, productive or otherwise, and the retained income of corporations. It can be arrived at from NNP at Factor Cost by making certain additions and deductions.

The additions include transfer payments such as pensions, unemployment allowances, sickness and other social security benefits, gifts and remittances from abroad, windfall gains from lotteries or from horse racing, and interest on public debt. The deductions include income from government departments as well as surpluses from public undertakings, and employees' contribution to social security schemes like provident funds, life insurance, etc.

Thus Private Income = National Income (or NNP at Factor Cost) + Transfer Payments + Interest on Public Debt — Social Security — Profits and Surpluses of Public Undertakings.

(F) Personal Income:

Personal income is the total income received by the individuals of a country from all sources before payment of direct taxes in one year. Personal income is never equal to the national income, because the former includes the transfer payments whereas they are not included in national income.

Personal income is derived from national income by deducting undistributed corporate profits, profit taxes, and employees' contributions to social security schemes. These three components are excluded from national income because they do not reach individuals.

But business and government transfer payments, and transfer payments from abroad in the form of gifts and remittances, windfall gains, and interest on public debt which are a source of income for individuals are added to national income.

Thus $\text{Personal Income} = \text{National Income} - \text{Undistributed Corporate Profits} - \text{Profit Taxes} - \text{Social Security Contribution} + \text{Transfer Payments} + \text{Interest on Public Debt}$.

Personal income differs from private income in that it is less than the latter because it excludes undistributed corporate profits.

Thus Personal Income = Private Income – Undistributed Corporate Profits – Profit Taxes.

(G) Disposable Income:

Disposable income or personal disposable income means the actual income which can be spent on consumption by individuals and families. The whole of the personal income cannot be spent on consumption, because it is the income that accrues before direct taxes have actually been paid. Therefore, in order to obtain disposable income, direct taxes are deducted from personal income.

Disposable Income = Personal Income – Direct Taxes.

But the whole of disposable income is not spent on consumption and a part of it is saved. Therefore, disposable income is divided into consumption expenditure and savings.

Thus Disposable Income = Consumption Expenditure + Savings.

If disposable income is to be deduced from national income, we deduct indirect taxes plus subsidies, direct taxes on personal and on business, social security payments, undistributed corporate profits or business savings from it and add transfer payments and net income from abroad to it.

Thus $\text{Disposable Income} = \text{National Income} - \text{Business Savings} - \text{Indirect Taxes} + \text{Subsidies} - \text{Direct Taxes on Persons} - \text{Direct Taxes on Business} - \text{Social Security Payments} + \text{Transfer Payments} + \text{Net Income from abroad}$.

(H) Real Income:

Real income is national income expressed in terms of a general level of prices of a particular year taken as base. National income is the value of goods and services produced as expressed in terms of money at current prices. But it does not indicate the real state of the economy.

It is possible that the net national product of goods and services this year might have been less than that of the last year, but owing to an increase in prices, NNP might be higher this year. On the contrary, it is also possible that NNP might have increased but the price level might have fallen, as a result national income would appear to be less than that of the last year. In both the situations, the national income does not depict the real state of the country. To rectify such a mistake, the concept of real income has been evolved.

In order to find out the real income of a country, a particular year is taken as the base year when the general price level is neither too high nor too low and the price level for that year is assumed to be 100. Now the general level of prices of the given year for which the national income (real) is to be determined is assessed in accordance with the prices of the base year. For this purpose the following formula is employed.

Real NNP = $\text{NNP for the Current Year} \times \text{Base Year Index (=100)} / \text{Current Year Index}$

Suppose 1990-91 is the base year and the national income for 1999-2000 is Rs. 20,000 crores and the index number for this year is 250. Hence, Real National Income for 1999-2000 will be = $20000 \times 100/250 = \text{Rs. } 8000$ crores. This is also known as national income at constant prices.

(I) Per Capita Income:

The average income of the people of a country in a particular year is called Per Capita Income for that year. This concept also refers to the measurement of income at current prices and at constant prices. For instance, in order to find out the per capita income for 2001, at current prices, the national income of a country is divided by the population of the country in that year.

Similarly, for the purpose of arriving at the Real Per Capita Income, this very formula is used.

This concept enables us to know the average income and the standard of living of the people. But it is not very reliable, because in every country due to unequal distribution of national income, a major portion of it goes to the richer sections of the society and thus income received by the common man is lower than the per capita income.

1.3 NATIONAL INCOME ACCOUNTING IDENTITIES

The interrelationships among NI, GNP and PI form the basis for accounting identities or definitions. Circular flow of income tells us that

national product = national income = national expenditures. National product is a monetary measure of all currently produced final goods and services. National income is the sum of all factor earnings. Factor earnings are then used for consumption and investment.

National expenditures are, thus, sum of all private consumption and investment expenditures as well as government expenditure. National product is, thus, identically equal to national income which is identically equal to national expenditures. These are called accounting identities.

We assume that:

- (i) There is no governmental activity
- (ii) No foreign trade
- (iii) Depreciation costs are nil. We refer to national income and national output interchangeably.

In this imaginary economy, we symbolize GNP by Y .

GNP has two elements in this simplified two-sector economy:

consumption (C) and investment (I).

We want to show the first identity:

output produced equals output sold.

Thus,

$$Y = C + I \quad \dots(\text{I})$$

(since $G = 0$, and net export $[X - M] = 0$)

In other words, all output produced is consumed and invested. This output is partly allocated for consumption and partly for saving.

Thus, we can write

$$Y = C + S \quad \dots(\text{II})$$

since $T = 0$

Now, we can combine identities (8.1) and (8.2). Since national product and national income are identically equal, $C + I$ must be equal to $C + S$.

That is,

$$C + I = Y = C + S \quad \dots(\text{III})$$

The left-hand side of identity (III) shows the components of national product or aggregate demand or aggregate expenditure and the right-hand side shows the distribution of income between consumption and saving. This equation shows that output produced is equal to output sold. The value of output produced is equal to income received and income

received is partly spent on consumption and partly saved. Slightly arranging equation (III), we obtain saving- investment identity:

$$I = Y - C = S$$

$$\text{Or, } I = S \quad \dots(\text{IV})$$

This means that in a two-sector economy—where governmental sector and foreign trade are absent—investment is identically equal to saving.

In other words, accounting identity or definitional identity states that actual saving or ex-post saving is always equal to actual investment or ex-post investment. However, ex-ante saving or planned saving is not necessarily identically equal to ex-ante investment or desired investment.

To make our discussion a realistic one, we introduce government sector and foreign trade sector. Once government is introduced into the picture, we see that government both spends (G) and collects taxes (T) as revenues. Further, the government, like individuals, can also save. Government saving occurs when revenue exceeds expenditure of the government.

Once international trade is introduced, there may also occur saving in the foreign trade sector. Whenever exports (X) exceed imports (M), saving in the foreign sector emerges. Thus, we have three kinds of savings: personal saving (S), government saving (T – G) and foreign saving (X – M). In this economy,

$$S \equiv Y - C - T \quad \dots(\text{V})$$

We know that,

$$Y \equiv C + I + G + X - M \quad \dots(\text{VI})$$

Putting the value of (VI) into (V) we obtain

$$S \equiv (C + I + G + X - M) - C - T \quad \dots(\text{VII})$$

Arranging equation (VII) and solving for I, we find that all three types of savings become equal to investment:

$$I \equiv S + (T - G) + (X - M) \quad \dots(\text{VIII})$$

Thus, investment and savings are equal.

Ignoring external sector, we can write the following identity:

$$Y - T - C + S \quad \dots(\text{IX})$$

We can write (IX) as

$$Y \equiv C + S + T \quad \dots(\text{X})$$

In the absence of external sector, we have

$$Y \equiv C + I + G \quad \dots(XI)$$

Combining (X) and (XI), we get

$$C + I + G \equiv Y \equiv C + S + T \quad \dots(XII)$$

Cancelling (C) on both sides of (XII), we can rewrite this fundamental identity as

$$I + G \equiv S + T \quad \dots(XIII)$$

(closed economy)

$$I + G + X \equiv S + T + M \quad \dots(XIV)$$

(open economy)

1.3.1 The Role of Imports in the National Income Identity:

It is important to emphasize why imports are subtracted in the national income identity because it can lead to serious misinterpretations. First, one might infer (incorrectly) from the identity that imports are subtracted because they represent a cost to the economy. This argument often arises because of the typical political emphasis on jobs or employment. Thus higher imports imply that goods that might have been produced at home are now being produced abroad. This could represent an opportunity cost to the economy and justify subtracting imports in the identity. However, this argument is wrong.

The second misinterpretation that sometimes arises is to use the identity to suggest a relationship between imports and GDP growth. Thus it is common for economists to report that GDP grew at a slower than expected rate last quarter because imports rose faster than expected. The identity suggests this relationship because, obviously, if imports rise, GDP falls. However, this interpretation is also wrong.

The actual reason why imports are subtracted in the national income identity is because imports appear in the identity as hidden elements in consumption, investment, government, and exports. Thus imports must be subtracted to assure that only domestically produced goods are being counted. Consider the following details.

When consumption expenditures, investment expenditures, government expenditures, and exports are measured, they are measured without accounting for where the purchased goods were actually made. Thus, consumption expenditures (C) measures domestic expenditures on both domestically produced and foreign-produced goods. For example, if a U.S. resident buys a television imported from Korea, that purchase would be included in domestic consumption expenditures. Likewise, if a business purchases a microscope made in Germany, that purchase would be included in domestic investment. When the government buys foreign goods abroad to provide supplies for its foreign embassies, those purchases are included in government expenditures. Finally, if an intermediate product is imported,

used to produce another good, and then exported, the value of the original imports will be included in the value of domestic exports.

This suggests that we could rewrite the national income identity in the following way:

$$GDP = (C_D + C_F) + (I_D + I_F) + (G_D + G_F) + (EX_D + EX_F) - IM,$$

where C_D represents consumption expenditures on domestically produced goods, C_F represents consumption expenditures on foreign-produced goods, I_D represents investment expenditures on domestically produced goods, I_F represents investment expenditures on foreign-produced goods, G_D represents government expenditures on domestically produced goods, G_F represents government expenditures on foreign-produced goods, EX_D represents export expenditures on domestically produced goods, and EX_F represents export expenditures on previously imported intermediate goods. Finally, we note that all imported goods are used in consumption, investment, or government or are ultimately exported, thus

$$IM = C_F + I_F + G_F + EX_F.$$

Plugging this expression into the identity above yields

$$GDP = C_D + I_D + G_D + EX_D$$

and indicates that GDP does not depend on imports at all.

The reason imports are subtracted in the standard national income identity is because they have already been included as part of consumption, investment, government spending, and exports. If imports were not subtracted, GDP would be overstated. Because of the way the variables are measured, the national income identity is written such that imports are added and then subtracted again.

This exercise should also clarify why the previously described misinterpretations were indeed wrong. Since imports do not affect the value of GDP in the first place, they cannot represent an opportunity cost, nor do they directly or necessarily influence the size of GDP growth.

1.4 INFLATION AND PRICE INDICES

1.4.1 Inflation: Meaning

Inflation is the rate of increase in prices over a given period of time. Inflation is typically a broad measure, such as the overall increase in prices or the increase in the cost of living in a country. But it can also be more narrowly calculated—for certain goods, such as food, or for services, such as a haircut, for example. Whatever the context, inflation represents how much more expensive the relevant set of goods and/or services has become over a certain period, most commonly a year.

More jobs and higher wages increase household incomes and lead to a rise in consumer spending, further increasing aggregate demand and the scope

for firms to increase the prices of their goods and services. When this happens across a large number of businesses and sectors, this leads to an increase in inflation.

1.4.2 How is Inflation Measured?

Inflation is an increase in the level of prices of the goods and services that households buy. It is measured as the rate of change of those prices. Typically, prices rise over time, but prices can also fall (a situation called deflation).

The most well-known indicator of inflation is the Consumer Price Index (CPI), which measures the percentage change in the price of a basket of goods and services consumed by households.

Consumers' cost of living depends on the prices of many goods and services and the share of each in the household budget. To measure the average consumer's cost of living, government agencies conduct household surveys to identify a basket of commonly purchased items and track over time the cost of purchasing this basket. The cost of this basket at a given time expressed relative to a base year is the *consumer price index* (CPI), and the percentage change in the CPI over a certain period is consumer price inflation, the most widely used measure of inflation. (For example, if the base year CPI is 100 and the current CPI is 110, inflation is 10 percent over the period.)

Core consumer inflation focuses on the underlying and persistent trends in inflation by excluding prices set by the government and the more volatile prices of products, such as food and energy, most affected by seasonal factors or temporary supply conditions. Core inflation is also watched closely by policymakers. Calculation of an overall inflation rate—for a country, say, and not just for consumers—requires an index with broader coverage, such as the *GDP* deflator.

The CPI basket is mostly kept constant over time for consistency, but is tweaked occasionally to reflect changing consumption patterns—for example, to include new hi-tech goods and to replace items no longer widely purchased. Because it shows how, on average, prices change over time for everything produced in an economy; the contents of the GDP deflator vary each year and are more current than the mostly fixed CPI basket. On the other hand, the deflator includes no consumer items (such as military spending) and is therefore not a good measure of the cost of living.

1.4.3. What are Price Indices?

A price index (PI) is a measure of how prices change over a period of time, or in other words, it is a way to measure inflation. There are multiple methods on how to calculate inflation (or deflation). In this guide we will take a look at a couple of methods on how to do so. Inflation is one of the core metrics monitored by the FED in order to set interest rates.

Indices aren't just calculated for no reason. They have a significant influence on policymakers' choices and the economy's functioning. For example, they have a direct impact on the earnings of union employees who get cost-of-living modifications based on the consumer price index (CPI).

The general formula for the price index is the following:

$$PI_{1,2} = f(P_1, P_2, X)$$

Where:

- $PI_{1,2}$: Some PI that measures the change in price from period 1 to period 2
- P_1 : Price of goods in period 1
- P_2 : Price of goods in period 2
- X : Weights (the weights are used in conjunction with the prices)
- f : General function

1.4.4 Types of Price Indices:

1. Laspeyres Price Index:

Ernst Louis Etienne Laspeyres (1834-1913) was a German economist and statistician. Laspeyres's main contribution to economics and statistics was his work on index numbers and calculating inflation. The formula for Laspeyres Price Index is as follows:

$$L(P) = \frac{\sum_{i=1}^N P_i^F Q_i^B}{\sum_{i=1}^N P_i^B Q_i^B}$$

Where:

- P_i^B : The price of good i in the Base period
- P_i^F : The price of good i in the Final period
- Q_i^B : The quantity consumed of good i in the Base period
- Q_i^F : The quantity consumed of good i in the Final period

The Laspeyres PI weighs prices (both Base period prices and Final period prices) with base period quantities. Consider an economy with N goods and services. The numerator in the Laspeyres price index calculates nominal expenditure required to consume base period quantity at final period prices. The denominator calculates nominal GDP in the base period.

2. Paasche Price Index

Hermann Paasche (1851-1925) was a German economist and statistician. Paasche's main contribution to economics and statistics was his work on wage inflation. The formula for the Paasche Price Index is as follows:

$$P(P) = \frac{\sum_{i=1}^N P_i^F Q_i^F}{\sum_{i=1}^N P_i^B Q_i^F}$$

Where:

- P_i^B : The price of good i in the Base period
- P_i^F : The price of good i in the Final period
- Q_i^B : The quantity consumed of good i in the Base period
- Q_i^F : The quantity consumed of good i in the Final period

Paasche PI weighs prices (both Base period prices and Final period prices) with Final period quantities. Consider an economy with N goods and services. The numerator calculates nominal GDP in the Final period. The denominator in the price index calculates nominal expenditure required to consume Final period quantities at Base period prices.

3. Marshall-Edgeworth Index:

Alfred Marshall (1842-1924) was an English economist who is widely considered to be the father of modern neoclassical economics. Marshall's book, *Principles of Economics* (1890), is one of the most influential textbooks in the history of economic thought. Francis Ysidro Edgeworth (1845-1926) was an Anglo-Irish economist and philosopher. Edgeworth was one of the earliest proponents of using statistics to analyze economic questions.

The formula for the Marshall-Edgeworth Price Index is as follows:

$$ME(P) = \frac{L(P) + P(P)}{2}$$

Where:

- $L(P)$: The Laspeyres Price Index
- $P(P)$: The Paasche Price Index

The Marshall-Edgeworth Price Index is the arithmetic mean (simple average) of the Laspeyres Price Index and the Paasche Price Index.

4. Fisher Price Index:

Irving Fisher (1867-1947) was an American economist and statistician. Fisher was one of the earliest neoclassical economists in the US and is known as the first econometrician (application of linear regression to economic theory). The American worked on many areas of economics, including trade, monetary theory, and inflation measurement.

The formula for the Fisher Price Index is as follows:

$$F(P) = \sqrt{L(P)P(P)}$$

The Fisher Price Index is the geometric mean of the Laspeyres Price Index and the Paasche Price Index.

1.4.5 Consumer price indices (CPIs):

A) Meaning: CPI are index numbers that measure changes in the prices of goods and services purchased or otherwise acquired by households, which households use directly, or indirectly, to satisfy their own needs and wants. Consumer price indices can be intended to measure either the rate of price inflation as perceived by households, or changes in their cost of living (that is, changes in the amounts that the households need to spend in order to maintain their standard of living). There need be no conflict between these two objectives. In practice, most CPIs are calculated as weighted averages of the percentage price changes for a specified set, or “basket”, of consumer products, the weights reflecting their relative importance in household consumption in some period. Much depends on how appropriate and timely the weights are.

As CPIs provide timely information about the rate of inflation, they have also come to be used for a wide variety of purposes in addition to indexing wages. For example:

- CPIs are widely used to index pensions and social security benefits.
- CPIs are also used to index other payments, such as interest payments or rents, or the prices of bonds.
- CPIs are also commonly used as a proxy for the general rate of inflation, even though they measure only consumer inflation. They are used by some governments or central banks to set inflation targets for purposes of monetary policy.
- The price data collected for CPI purposes can also be used to compile other indices, such as the price indices used to deflate household consumption expenditures in national accounts, or the purchasing power parities used to compare real levels of consumption in different countries.

The Producer Price Indexes the PPIs are used to estimate prices received by domestic producers of goods at various levels of processing. The PPI is largely composed of manufactured products, a

Producer Price Indexes are presented in a number of ways based on different classifications of goods. The classification by Stage of Processing divides goods into three main categories: semi-finished, intermediate and finished goods. Crude goods are items that are entering the market for the first time, that have not been manufactured or fabricated, and that are not sold directly to consumers. They include items like grains, livestock, cotton, and crude oil. Items like lumber, fertilizer, machine belts, and yarn are intermediate goods. They have been processed but may require further processing, or may be complete but will be used by businesses as material inputs. Finished goods will not undergo further processing; that category includes consumer goods as well as capital equipment.

B) Limitations of the CPI:

1. **CPI is not an indicator of the price level:** The CPI measures the rate of price changes in the economy, but not the price level. If the price index of bread is 140 and the price index of eggs is 180, it does not mean that eggs are more expensive than bread. It only means that the price of eggs has increased by more than the price of bread from a particular point in time.
2. **Coverage:** For practical reasons, the CPI measures price changes of items in the metropolitan cities. It does not measure price changes in regional, rural or remote areas. The CPI also does not take into account the differences in spending patterns between individual households. Households are very different and some may spend a lot more on a certain items than others. For example, cars have a weight of almost 3 per cent in the CPI basket, but not every household owns a car.
3. **Quality changes:** The CPI intends to only calculate pure price changes. This means the CPI should ignore price changes that result from variations in the quality of items. The quality of items in the basket can vary and new products can be introduced. For example, a bag of pasta can become smaller in weight, or the quality of a mobile phone can improve if its camera is upgraded.
4. **Substitution bias:** The CPI is affected by 'substitution bias'. This is because the CPI does not adjust for changes in household spending patterns very often (as identifying such changes for all households is a major undertaking). In reality, households frequently change the amounts they spend on items.
5. **New products:** The CPI does not include new products as soon as they appear on the market. It can often take some time until the ABS includes them in the CPI basket. This typically occurs once a product has reached a high enough market share and is available to most households.
6. **Cost of living:** The CPI is often used to measure changes in the cost of living, but it is not an ideal indicator of this. While the CPI measures price changes, cost-of-living inflation is the change in spending by households required to maintain a given standard of living. The ABS publishes other indexes that aim to provide a better indicator of the cost of living.

1.5 NEED FOR NATIONAL INCOME ACCOUNTING

1. **Indicates Economic Growth:** – it indicates performance and the level of economic growth in an economy. The data on national income and per capita display the true picture of the health of an economy. If both are increasing continuously, it surely reflects an increase in economic welfare, otherwise not.

2. **Helps in Policy Formulation:** – Statistical data on national income not only helps in making economic analysis but also helps in policy formulation. Moreover it not only helps in formulating fiscal policy, monetary policy, foreign trade policy but also helps in making modifications and amendments wherever necessary.
3. **Helpful in Making Comparisons** – it helps us in comparing national income and per capita income of our country with those of other countries. This may lead us to make suitable changes in our plans and approach to achieve rapid economic development of our country.
4. **Helpful to Trade Unions** – National accounts throw light on distribution of factor incomes which is very helpful to trade unions and other labour organizations in making rational analysis of the remuneration the labourers are getting.
5. **Distribution of income** – National income accounting describes distribution of national income in terms of factors like interest, rent, profit & wages. It also shows the relative significance of the factors of production in the economy.
6. **Helpful in economic planning** – National income accounting is helpful in economic planning. The planning commission comes to know about the resources available for economic planning.
7. **Structural changes in the economy** – National income accounting is helpful in providing knowledge of structural changes in the economy. We are able to know that decrease or increase in share of agriculture and industry in national income.
8. **Facilitates forecasting** – National income accounting is helpful in forecasting the effect of economic policies on the level of production & employment.

1.6 QUESTIONS

I (A) Choose the correct alternative from below and complete the statements.

1. Inflation is a _____ in the overall price level
 - (a) Balancing
 - (b) Decreasing
 - (c) Increase
 - (d) change
2. Inflation rate is tracked by calculating changes in a measure called the _____
 - (a) Consumer product index
 - (b) Consumer product index
 - (c) Central price index
 - (d) Consumer price index

3. To control inflation, the central bank raises the CRR which ----- the lending capacity of the commercial banks.
- (a) makes constant
 - (b) pushing
 - (c) increases
 - (d) reduces
4. **The Reserve Bank of India (RBI) can take the measure of _____ to control inflation within the country.**
- (a) Rationing of credit
 - (b) Introducing a progressive tax system
 - (c) Improving profits of the public sector
 - (d) Controlling public expenditure
5. **How does inflation help in the redistribution of income?**
- (a) Disproportional change in prices
 - (b) Proportional changes in prices
 - (c) Falling prices
 - (d) Rising prices
6. **_____ is an effective method to control inflation in the economy.**
- (a) Bank rate policy
 - (b) Summative Research
 - (c) Cash reserve ratio
 - (d) 'Ex-post Facto' Research
7. **For measuring the changes in the price level of the country, which among the following index number is used?**
- (a) Consumer price index number
 - (b) Production index number
 - (c) Security price index number
 - (d) Wholesale price index number
8. **Inflation rate based on consumer price index increases if _____.**
- (a) Reverse repo rate is decreased
 - (b) Bank rate is decreased
 - (c) Statutory Liquidity ratio is increased
 - (d) Repo rate is increased
9. **A rapid increase in the rate of inflation is sometimes attributed to the 'base effect'. What 'base effect'?**

- (a) It is the impact of drastic deficiency in supply due to failure of crops
- (b) It is the impact of the surge in demand due to rapid economic growth
- (c) It is the impact of the price levels of previous year on the calculation of inflation rate
- (d) None of the statements (A), (B) and (C) given above is correct in this content

10. Who has been recently made the chairman of the work group on revision of Wholesale Price Index Services?

- (a) C. Rangrajan
- (b) P.R. Panchamukhi
- (c) K.C. Pant
- (d) Abhijit Sen

Answer Key: 1-c, 2-d, 3-d, 4-a, 5-a, 6-c, 7-a, 8-b, 9-c, 10-d

I (B) State whether the following statements are True or False.

1. The percent change in a price index, such as the CPI or the GDP deflator, is used to calculate the inflation rate.
2. A price index (PI) is a measure of how prices change over a period of time.
3. When inflation causes lower prices, the demand for credit increases.
4. The RBI controls Inflation and Deflation by employing a variety of monetary policy tools.
5. In general, calculating real GDP is done by dividing nominal GDP by the GDP deflator (R).
6. Inflation is typically a broad measure, such as the overall increase in prices or the increase in the cost of living in a country.
7. **The most common measure of estimating inflation in India is Wholesale Price Index.**
8. The CPI intends to only calculate pure price changes..
9. From the expenditure view point, GNP is the sum total of expenditure incurred on goods and services during one year in a country
10. NDP at factor cost is the sum of net value added by all producers within the country.

Answer Key- True- 1,2,4,5, 6,8,9

False- 3,7, 10

Q.2 Descriptive Questions

1. Explain the National Income and its importance.
2. What do you mean by National Income Accounting? Explain its Importance
3. Bring out Concepts of National Income Accounting.
4. Explain the GDP and its Types.
5. Discuss the Green GDP.
6. Explain the Inflation and Price Indices.
7. Explain the Types of Price Indices.
8. Discuss the CPI and its Importance.

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SOCIAL ACCOUNTING

Unit Structure:

- 2.0 Objectives
- 2.1 Overview
- 2.2 Concepts of Social Accounting
- 2.3 Features of Social Accounting
- 2.4 Types of Social Accounting
- 2.5 National Income and Product Account
- 2.6 Input-Output Accounting
- 2.7 Flow of Accounts
- 2.8 Summary
- 2.9 Questions
- 2.10 Suggested Readings

2.0 OBJECTIVES

- To explain the explanation to Concepts of Social Accounting.
- To familiar with Input Output Accounting.
- To explain the overview of Flow of Funds.

2.1 UNIT OVERVIEW

This unit provides an explanation to Social Accounting. The unit then provides an overview of Concepts of National and Product Income, Input Output Accounting and Inflation and Flow of Funds Accounts.

2.2 CONCEPT OF SOCIAL ACCOUNTING

Since the publication of the General Theory national income accounting has become an official job, statistics of national income reflect changes in the economic health of the economy. They indicate the performance of the economy; the fluctuations in economic activity. As a result, many new concepts have come to be associated with the study of national income and social accounts.

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'. A grasp of the general concepts of social accounting is essential to the understanding of macroeconomic theory

because the macroeconomic truisms like $Y = C + I + G$ or $S = I$ are generally derived from the social accounts.

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.

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. 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.

2.3 FEATURES OF SOCIAL ACCOUNTING

1) 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) 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.”

(3) 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.

(4) Estimating Effects of Government Policies:

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.

(5) 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.

(6) 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.

2.4 TYPES OF SOCIAL ACCOUNTING

Now that you understand the basics and why social accounting is relevant, let's briefly look into the different types of Social Accounting along with some examples:

1. Environmental Accounting:

It provides information about how the business activities of the organisation are impacting nature. While some companies claim to be eco-friendly, their ecological footprint may tell an entirely different story. Environmental accounting requires developing and measuring indicators. The indicators show how producing and using products affect the environment. This is

important as traditional financial indicators, like GDP, only consider money. And they ignore environmental costs.

To get a more accurate picture of economic activities' true costs and benefits. We must change these indicators to include environmental expenses and advantages. By doing so, we can better understand the economic value of products and services. And make more informed decisions.

Some examples include

- Use of scarce resources such as oil, petroleum, and water.
- Cutting trees for using its various parts and plantation of trees to compensate for it.
- Jeopardization of land due to its activities.
- Installation of water treatment plants to treat and reuse the treated water.
- Emphasis on 3Rs i.e Reduce, Reuse and Recycle the waste produced.
- Air, soil, water and noise pollution caused.

Environmental accounting is crucial for organizations to be sustainable and responsible to society. It helps them understand how their actions affect the environment and how much it costs by considering environmental issues in their financial reports and decisions. They become more transparent and accountable. This also helps them find ways to save resources and reduce waste. Environmental accounting is essential for businesses to achieve long-term financial success. And preserve the environment for future generations.

Importance of Environmental Accounting:

People are becoming more aware of environmental issues. As a result, businesses are realizing the importance of Environmental Accounting. Governments are also introducing stricter environmental regulations. Making it crucial for businesses to keep track of their environmental impact.

- a. **Reducing Environmental Costs:** Environmental accounting helps businesses become more environmentally friendly. Companies identify areas where they can make changes to reduce their environmental impact by measuring the environmental costs of their production and consumption.
- b. **Meeting Environmental Regulations:** Environmental accounting helps companies follow government environmental regulations. These rules are getting stricter. Businesses must ensure they're following them to avoid fines.
- c. **Enhancing Corporate Reputation:** Customers care more and more about the environment. Companies need to have a good reputation when it comes to sustainability. This can make customers loyal and help the company stand out.

- d. **Assessing Environmental Risks:** Environmental accounting help companies identify environmental risks and take steps to prevent them. Businesses can see what could go wrong and fix it by analyzing their activities. This can help the company avoid disasters and protect its reputation.
- e. **Improving Resource Efficiency:** Environmental accounting can help businesses use resources more efficiently. Analyzing their environmental impact, companies can use less energy and water resources. This can save them money and help the environment.
- f. **Encouraging Innovation:** Environmental accounting can also encourage innovation. Companies can come up with new technologies that are more sustainable and efficient.

2. Sustainability Accounting:

Sustainability accounting provides a useful tool to identify, evaluate and manage social and environmental risks by identifying resource efficiency and cost savings and link improvements in social and environmental issues with financial opportunities. It provides social and economic sustainability information. It directly impacts society and the economic performance of an organisation. Sustainability goes beyond what we do with the items we already own. Purchasing sensibly often means only buying what we need, and when we do, investing in higher-quality, longer-lasting products. Some example includes

- Effects on the health of local communities due to emissions or hazardous waste.
- Fair compensation to farmers and artisans in return for their products & services.
- Installation of solar power plants to save electricity consumption.
- Ethical initiatives are taken by the company for the welfare of society.
- Measures were taken for employee safety and sustainability.
- Opening schools & other educational facilities in remote industrial areas for children of employees and locals.
- Paying taxes to local authorities and government fairly and on time.

Importance of Sustainable Accounting:

- a. **Economic development:** The inclusion of this pillar encourages corporations to develop sustainability plans. The economic pillar offers a more plausible alternative to sudden and extreme measures that corporations are often pressured into adopting. Abandoning fossil fuels immediately isn't an option, and the pillar of economic growth provides a counterbalance for this issue.
- b. **Social equity:** This is perhaps the most multifaceted sustainability pillar, and it focuses on a wider view of the world. It encompasses global physical health and how it can be impacted by businesses'

reliance on harmful fossil fuels. The social equity pillar also involves education; where people are educated about their daily choices, they're more likely to live sustainably. Social cohesion, better health, and education all create a better chance of people working cooperatively toward a healthier planet. In this case, social equity focuses on globalization rather than individualism.

- c. **Human sustainability:** This pillar ties in with the previous point in many ways. This pillar aims to improve human capital in society through access to nutrition education, knowledge and skills, and investments in health and education systems.
- d. **Green spaces:** Green spaces help to regulate and improve air quality, particularly in urban areas. When done properly, landscaping can reduce nitrate leaching from the soil into the water, keeping pollutants out of city water supplies. An abundance of plants keeps soil in place, ensuring that sediment doesn't enter roads, drains, lakes, and streams.
- e. **Public Health:** Sustainable accounting also increases public health, saving money on healthcare each year. It focuses on providing for future generations rather than thinking solely about the fast-paced lives of people today.
- f. **Environmental protection:** Social accounting is about educating people and encouraging private organizations to make better decisions that don't negatively impact the environment's health. It also encourages the development of renewable sources, better technology, and a greener future.

3. Green Accounting:

Green accounting has gained importance in India in recent years, as the country faces numerous environmental challenges, including air pollution, water scarcity, and climate change. In response to these challenges, the Indian government has implemented various policies and initiatives to promote sustainable development and encourage businesses to adopt green accounting practices. Green Accounting, also known as environmental accounting or sustainable accounting, is a system of accounting that takes into account the economic, environmental, and social costs and benefits of business activities. It involves measuring and reporting the impacts of economic activities on natural resources and the environment, in addition to traditional financial measures.

The objectives of Green Accounting are to:

- Integrate environmental costs and benefits into national accounts and decision-making processes.
- Provide a comprehensive view of the true costs and benefits of economic activities by incorporating environmental and social considerations.

- Promote sustainable development and support the transition towards a green economy.
- Encourage transparency and accountability in the use of natural resources and the management of environmental impacts.
- Foster stakeholder engagement and participation in environmental decision-making.

Green Accounting Importance :

Green accounting is important for several reasons:

- Environmental Protection:** Green accounting helps to identify the environmental impacts of economic activities and promotes sustainable development by encouraging the conservation and efficient use of natural resources.
- Cost Savings:** By measuring and managing environmental impacts, businesses can identify opportunities for cost savings through improved resource efficiency, reduced waste, and lower environmental compliance costs.
- Risk Management:** Green accounting helps businesses to identify and manage environmental risks that could impact their operations or reputation, such as regulatory changes or environmental disasters.
- Stakeholder Engagement:** By reporting on environmental and social performance, businesses can demonstrate their commitment to sustainability to stakeholders, including customers, investors, and regulators.
- Policy Development:** Green accounting can inform the development of policies and regulations that promote sustainable development and help to address environmental challenges such as climate change and biodiversity loss.
- National Accounting:** National income accounting is a bookkeeping system that a government uses to measure the level of the country's economic activity in a given time period. National income accounting refers to the set of methods and principles that are used by the government for measuring production and income, or in other words economic activity of a country in a given time period. The various measures of determining national income are GDP (Gross Domestic Product), GNP (Gross National Product), and NNP (Net National Product) along with other measures such as personal income and disposable income.

It analyses the economic activities of a country. It analyses the total expenditure incurred by a country to conduct its business. National income accounting systems allow countries to assess the current standard of living or the distribution of income within a population, as well as assess the effects of various economic policies. However, the accuracy of analysis

relating to national income accounting is only as accurate as the data collected.

Although national income accounting is not an exact science, it provides useful insight into how well an economy is functioning, and where money is being generated and spent. When combined with information regarding the associated population, data regarding per capita income and growth can be examined over a period of time.

The importance of national income accounting is that it is helpful in facilitating techniques and procedures for measurement of output and income at the aggregate level. It is a process of preparing national income accounts that is based on the principles of double entry system of business accounting.

National income accounting helps in summarising the economic performance of a country by measuring the national income aggregates for the year. The government policies are framed on the basis of the data obtained from national income accounting.

2.5 NATIONAL INCOME AND PRODUCT ACCOUNTING

Many of the key aggregate variables used to describe an economy are presented in a country's National Income and Product Accounts (NIPA). National income represents the total amount of money that factors of production earn during the course of a year. This mainly includes payments of wages, rents, profits, and interest to workers and owners of capital and property. The national product refers to the value of output produced by an economy during the course of a year. National product, also called national output, represents the market value of all goods and services produced by firms in a country. Because of the circular flow of money in exchange for goods and services in an economy, the value of aggregate output (the national product) should equal the value of aggregate income (national income).

Consider the adjoining circular flow diagram, Figure 2.1 "A Circular Flow Diagram", describing a very simple economy. The economy is composed of two distinct groups: households and firms. Firms produce all the final goods and services in the economy using factor services (labor and capital) supplied by the households. The households, in turn, purchase the goods and services supplied by the firms. Thus goods and services move between the two groups in the counterclockwise direction. Exchanges are facilitated with the use of money for payments. Thus when firms sell goods and services, the households give the money to the firms in exchange. When the households supply labor and capital to firms, the firms give money to the households in exchange. Thus money flows between the two groups in a clockwise direction.

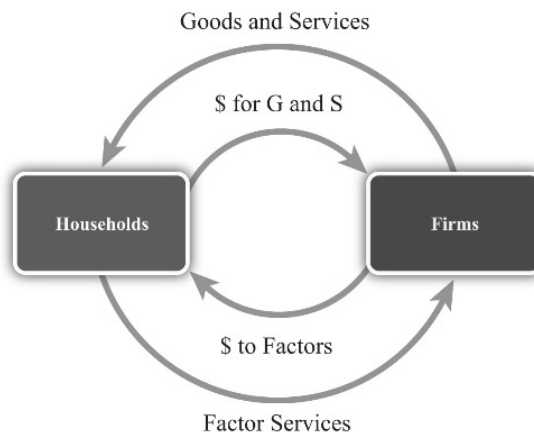


Figure 2.1 A Circular Flow Diagram

National product measures the monetary flow along the top part of the diagram—that is, the monetary value of goods and services produced by firms in the economy. National income measures the monetary flow along the bottom part of the diagram—that is, the monetary value of all factor services used in the production process. As long as there are no monetary leakages from the system, national income will equal national product.

The national product is commonly referred to as gross domestic product (GDP). GDP is defined as the value of all final goods and services produced within the borders of a country during some period of time, usually a year. A few things are worth emphasizing about this definition.

First, GDP is measured in terms of the monetary (or dollar) value at which the items exchange in the market. Second, it measures only *final* goods and services as opposed to intermediate goods. Thus wheat sold by a farmer to a flour mill will not be directly included as part of GDP since the value of the wheat will be included in the value of the flour that the mill sells to the bakery. The value of the flour will in turn be included in the value of the bread sold to the grocery store. Finally, the value of the bread will be included in the price charged by the grocery when the product is finally purchased by the consumer. Only the final bread sale should be included in GDP or else the intermediate values would overstate total production in the economy. Finally, GDP must be distinguished from another common measure of national output, gross national product (GNP).

Briefly, GDP measures all production within the borders of the country regardless of who owns the factors used in the production process. GNP measures all production achieved by domestic factors of production regardless of where that production takes place.

GDP is probably the most widely reported and closely monitored aggregate statistic. GDP is a measure of the size of an economy. It tells us the total amount of “stuff” the economy produces. Since most of us, as individuals, prefer to have more stuff rather than less, it is straightforward to extend this to the national economy to argue that the higher the GDP, the better off the nation. For this simple reason, statisticians track the growth rate of GDP. Rapid GDP growth is a sign of growing prosperity and economic strength.

Falling GDP indicates a recession, and if GDP falls significantly, we call it an economic depression.

National Income and Product Accounts (NIPA) are the cornerstone of National Income Accounting. They provide a statistical view of the output, income, and expenditure in an economy. NIPA consists of a group of detailed tables that show the functioning of various aspects of the economy. Some crucial components encompassed by NIPA include Personal Consumption Expenditures (PCE), Gross Private Domestic Investment (GPDI), and Government Consumption Expenditures and Gross Investment (GCEGI).

Components of National income and product accounts:

1. Personal Consumption Expenditures (PCE):

This represents consumption by households on goods and services within an economy. It includes all consumer spending on durable goods, non-durable goods, and services.

2. Gross Private Domestic Investment (GPDI):

This refers to the spending by businesses, households, and nonprofits on new capital. These encompass structures, equipment, and inventory investment.

3. Government Consumption Expenditures and Gross Investment (GCEGI):

This signifies government spending within an economy. It comprises all government consumption, investment, and transfer payments.

Each sector represented plays a crucial role in the health and growth of an economy. They indicate spending patterns, potential future production levels due to investment, and government's contribution towards public goods and services. The in-depth understanding of these components is critical in analysing the nature and trajectory of an economy.

Importance of National Income and Product Account:

- a) **Macroeconomic Analysis:** National Income Accounting equips economists with data-driven insights into an economy's overall health, shining light on inflation, unemployment, and economic growth rates.
- b) **Policy Formulation:** The data procured through National Income Accounting serves as the bedrock of economic and financial policies. The information on national income acts as a guiding light for formulating strategies in monetary and fiscal areas.
- c) **International Comparisons:** National Income Accounting provides a framework for comparing the economic performances of different countries, thereby enriching the study of international economics.

- d) **Economic Forecasting:** Based on trends in National Income Accounting data, economists formulate forecasts that guide future planning and policy making.

2.6 INPUT OUTPUTS ACCOUNTING

Input-output analysis (I-O) is a form of macroeconomic analysis based on the interdependencies between different economic sectors or industries. This method is commonly used for estimating the impacts of positive or negative economic shocks and analyzing the ripple effects throughout an economy. I-O economic analysis was originally developed by Wassily Leontief (1906–1999), who later won the Nobel Memorial Prize in Economic Sciences for his work in this area.

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.

While input-output analysis is not commonly utilized by neoclassical economics or by policy advisers in the West, it has been employed in Marxist economic analysis of coordinated economies that rely on a central planner.

By using I-O models, economists can estimate the change in output across industries due to a change in inputs in one or more specific industries.

- The direct impact of an economic shock is an initial change in expenditures. For example, building a bridge would require spending on cement, steel, construction equipment, labor, and other inputs.
- The indirect, or secondary, impact would be due to the suppliers of the inputs hiring workers to meet demand.
- The induced, or tertiary, impact would result from the workers of suppliers purchasing more goods and services for personal consumption. This analysis can also be run in reverse, seeing what effects on inputs were likely the cause of observed changes in outputs.

e.g. Here's an example of how I-O analysis works. A local government wants to build a new bridge and needs to justify the cost of the investment. To do so, it hires an economist to conduct an I-O study.

The economist talks to engineers and construction companies to estimate how much the bridge will cost, the supplies needed, and how many workers will be hired by the construction company.

The economist converts this information into dollar figures and runs numbers through an I-O model, which produces the three levels of impacts.

The direct impact is simply the original numbers put into the model, for example, the value of the raw inputs (cement, steel, etc.).

The indirect impact is the jobs created by the supplying companies, so cement and steel companies. These companies need to hire workers to complete the project. They either have the funds to do so or have to borrow the money to do so, which would have another impact on banks.

The induced impact is the amount of money that the new workers spend on goods and services for themselves and their families. This includes basics such as food and clothing, but now that they have more disposable income, it also relates to goods and services for enjoyment.

The I-O analysis studies the ripple effects on various sectors of the economy caused by the local government wanting to build a new bridge. The bridge may require certain costs from the government, utilizing taxes, but the I-O analysis will show the benefits the project generates by hiring companies that hire workers that spend in the economy, helping it to grow.

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.

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.

2.7 FLOW OF ACCOUNTS

The national income accounts do not tell anything about monetary or financial transactions whereby one sector places its savings at the disposal of the other sectors of the economy by means of loans, capital transfers, etc.

In fact, the national income accounts do not take into consideration the financial dimensions of economic activity and they describe product accounts as if they are operated through barter. The flow of funds accounts

are meant to supplement national income and product accounts. The flow 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.

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 of 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 shows 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 helps in analysing the impact of monetary policies on the economy as to whether they bring stability or instability or economic fluctuations.

2.8 SUMMARY

- 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. 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.
- Sustainability accounting provides a useful tool to identify, evaluate and manage social and environmental risks by identifying resource efficiency and cost savings and link improvements in social and environmental issues with financial opportunities. It provides social and economic sustainability information. It directly impacts society and the economic performance of an organisation.
- National income accounting is a bookkeeping system that a government uses to measure the level of the country's economic activity in a given time period. National income accounting refers to the set of methods and principles that are used by the government for measuring production and income, or in other words economic activity of a country in a given time period.
- Input-output analysis (I-O) is a form of macroeconomic analysis based on the interdependencies between different economic sectors or industries. This method is commonly used for estimating the impacts of positive or negative economic shocks and analyzing the ripple effects throughout an economy.
- 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.

2.9 QUESTIONS

1. What is Social Accounting? Explain its Features.
2. Discuss the Types of Social Accounting in framing Macroeconomic Models.
3. Explain the National Income and Product Account. Bringout their Components.
4. What is Input-Output Accounting? Explain its Importance.
5. Outline the Limitations of Input-Output Accounting.
6. Explain the Importance of Flow of Accounts.
7. Write a note on-
 - a. Limitations of Flow of Accounts
 - b. Green Accounting
 - c. importance of Sustainable Accounting

2.10 SUGGESTED READINGS

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2. Kolstad, C.D., Environmental Economics, Oxford University Press, New Delhi, 1999.
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MODULE 2

CONSUMPTION EXPENDITURE AND INVESTMENT ANALYSIS

Unit Structure:

- 3.0 Objectives
- 3.1 Introduction
- 3.2 Absolute Income Hypothesis.
- 3.3 Relative Income Hypothesis.
- 3.4 Permanent Income Hypothesis.
- 3.5 Life Cycle Hypothesis.
- 3.6 Questions

3.0 OBJECTIVES

- To study and understand the meaning of consumption function
 - To understand various types of consumption function
 - To study various theories associated with consumption function
-

3.1 INTRODUCTION: CONSUMPTION FUNCTION

John Maynard Keynes in his celebrated work 'The General Theory' said that aggregate consumption is a function of aggregate current disposable income. According to Keynes's Psychological Law of Consumption, the consumption expenditure increases when income increases but the rate of increase in consumption expenditure is less than the rate of increase in income. In simple terms, it means that the change in consumption expenditure is less than the change in income ($\Delta C < \Delta Y$). The marginal propensity to consume (MPC) is less than the average propensity to consume (APC) and that the MPC is positive but less than one ($0 < MPC < 1$). It means that the consumer will always spend a certain percentage of the rise in income and hence his MPC will always be greater than zero but he will not spend his entire rise in income and hence the value of MPC will always be between zero and one. The consumption function was assumed to be constant and stable through time for Keynes believed that in the long term we are all dead. The Keynesian consumption function is therefore a short term consumption function.

Empirical Studies on Consumption Function.

In the late 1930s and 1940s, a number of empirical studies were conducted to verify Keynes's consumption function. In the post second world war years, the US economy experienced inflation in spite of reduced government expenditure. The US inflation was on account of higher

consumption demand which was realized by liquidating government bonds by US households. In 1946, Kuznets studied the consumption and income data for the US for the period 1869-1938 and found amongst other things that the consumption function was 0.9. The findings of Simon Kuznets were verified by Goldsmith in 1955 and he found that the long run consumption function was 0.87 and that it remained stable. These studies concluded that the short run consumption function is non-proportional because $MPC < APC$ whereas the long run consumption function was proportional because $MPC = APC$. Since then, a number of other economists had also studied consumption function phenomenon and put forward their theories which are known as post-Keynesian theories of consumption.

3.2 THE ABSOLUTE INCOME HYPOTHESIS

According to Keynes, the current level of income of the individual and that of the society determines consumption. The absolute size of the current income is the determinant of consumption according to Keynes. His theory was therefore known as the 'Absolute Income Theory of Consumption' or the absolute income hypothesis. Keynes also put forward his psychological law of consumption which states that as income increases, consumption also increases but the increase in consumption expenditure is less proportionate to the increase in income ($0 < MPC < 1$). The absolute income hypothesis has the following three features:

1. Consumption expenditure is a positive function of the absolute income of the current period. Greater the absolute income, greater will be consumption expenditure.
2. The psychological law of consumption which states that as income increases, consumption also increases but the increase in consumption expenditure is less proportionate to the increase in income ($0 < MPC < 1$).
3. Consumption expenditure does not have a proportionate relationship with income. The proportion of the absolute income that is spent on consumption is known as the 'average propensity to consume (APC)'. The APC falls as the income increases.

The Keynesian consumption function can be expressed as: $C = a + bY_d$. Here, C is the consumption expenditure, Y_d is the real disposable income, 'a' and 'b' are constants where 'a' is the intercept term denoting autonomous consumption or consumption at zero level of disposable income and 'b' is induced consumption or $MPC = \Delta C / \Delta Y$.

In the Keynesian consumption function, both rise and fall in consumption expenditure is disproportional i.e. when income increases, the rise in consumption expenditure is proportionally less than the rise in income. Similarly, when income decreases, the fall in consumption expenditure is proportionally less than the fall in income so that consumers are able to protect their consumption standards.

Consumption Function by Keynes

Consumption demand is an important component of the aggregate demand function. The aggregate demand function is the sum of consumption and investment demand in the economy. It determines the level of employment, output and national income. The consumption function is an expression of an empirical relationship between income and consumption. According to Keynes, consumption is a function of income. When the income of a community rises, consumption also rises. The extent of rise in consumption as a result of rise in income is determined by the propensity to consume. The propensity to consume is a schedule which describes the amounts of consumption at various levels of income. The consumption function schedule is given in Table 3.1 below.

Table 3.1: Consumption Function Schedule

Income (Y) (Rupees Billion)	Consumption (C) (Rupees Billion)
2000	2200
3000	3000
4000	3800
5000	4600
6000	5400
7000	6200
8000	7000

Table 3.1 indicates various levels of income and their corresponding levels of consumption expenditure by households. It also indicates that income and consumption expenditure are directly related. The consumption expenditure is found to be increasing at a constant rate, the marginal propensity to consume remains constant in the short run. The consumption function is graphically shown in Fig. 2.1 below.

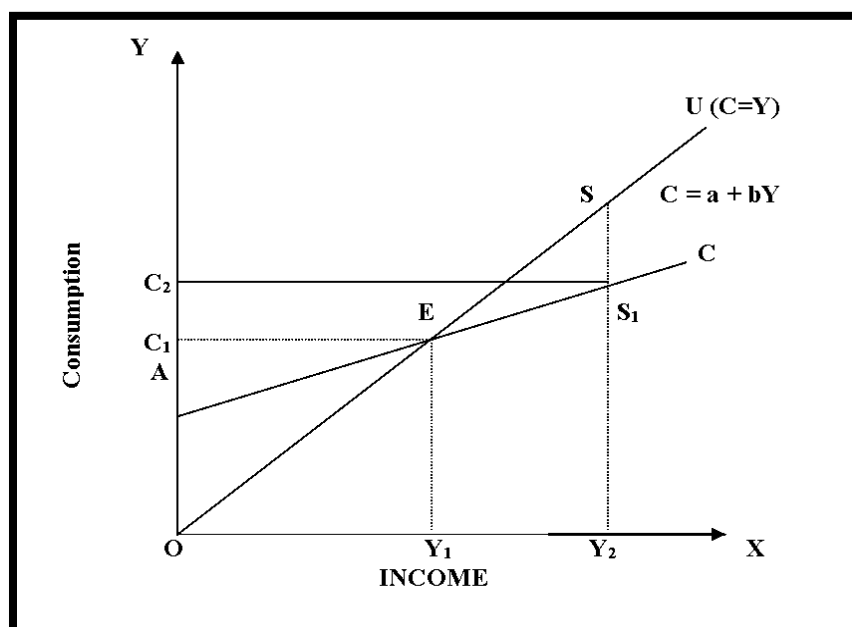


Fig.3.1: Consumption Function

In Fig. 3.1 above, the Y-axis measures consumption expenditure and the X-axis measures real income. The 'C' curve measures consumption function. The line of unity 'OZ' drawn at 45-degree angle indicates the equality between income and expenditure. Any point on the line of unity indicates that consumption is equal to income. The slope of the 'C' curve is flatter than the income curve after the intersection point 'D' indicating that the change in consumption is less than the change in income. You will notice that the change in consumption C_1C_2 is less than the change in income Y_1Y_2 . The vertical distance between the income and the consumption curves measures savings to the right of the intersection point and dis-savings to the left. At Y_2 level of income, the savings are equal to SS'. You may also notice that 'C' curve intercepts the Y-axis at point 'A' indicating that when income is zero, consumption expenditure is equal to OA. Such a situation indicates society in the state of nature wherein it consumes without producing. Further, at lower levels of income, a society or a nation may use its accumulated savings or borrow from other nations to maintain its consumption standards.

Average Propensity to Consume (APC):

The APC is the ratio of total consumption to total income in a given period of time. The value of APC at any income level can be found by dividing consumption expenditure by the level of income ($APC = C/Y$). The APC is calculated in column 3 of Table 3.2 below. You will notice that the proportion of income spent on consumption decreases as income increases. It progressively falls from 100% to 95, 92, 88 and 87.5%.

Table 3.2: Average & Marginal Propensity to Consume

Income (Y)	Consumption (C)	Average Propensity to Consume ($APC = C/Y$)	Marginal Propensity to Consume ($MPC = \Delta C/\Delta Y$)
3000	3000	$3000/3000 = 1$ or 100%	-
4000	3800	$3800/4000 = 0.95$ or 95%	$800/1000 = 0.8$ or 80%
5000	4600	$4600/5000 = 0.92$ or 92%	$800/1000 = 0.8$ or 80%
6000	5400	$5400/6000 = 0.90$ or 90%	$800/1000 = 0.8$ or 80%
7000	6200	$6200/7000 = 0.88$ or 88%	$800/1000 = 0.8$ or 80%
8000	7000	$7000/8000 = 0.875$ or 87.5%	$800/1000 = 0.8$ or 80%

*All figures in Rupees Billion.

APC reveals what percentage of the total cost of a given output is expected to be recovered by selling consumer goods. The reciprocal of APC is the average propensity to save ($APS = 1 - APC$). APS reveals what percentage of the total cost of a given output is expected to be recovered by selling capital goods. Thus the relative development of the capital and consumer goods industries in the economy is dependent upon the APC and APS. The APC is low in developed rich countries and it is high in underdeveloped poor countries. Symbolically, $MPC = \Delta C/\Delta Y$.

The Marginal Propensity to Consume:

The Marginal Propensity to Consume is the ratio of the change in the level of total consumption to a change in the level of total income. It reveals the effect of additional income on consumption. The marginal propensity to consume can be obtained by dividing change in consumption by change in income. Symbolically, $MPC = \Delta C / \Delta Y$.

In column 4 of table 1.2 above, the marginal propensity to consume is calculated at various levels of income. The MPC is found to be constant at all levels of income because Keynes assumed that MPC remains constant in the short run. The value of MPC lies between zero and one because a rise in consumption will always be less than a rise in income and a rise in income will always be followed by a rise in consumption. According to KK Kurihara, the concept of MPC helps us to understand the reality of under-full employment equilibrium. The gap between income and consumption at various levels of income cannot be adequately filled by investment because savings are never equal to investment. The MPC may however change during cyclical fluctuations i.e. the MPC may fall during the upswing and rise during the downswing. In the long run, the MPC declines along with rising prosperity of the country. Thus the MPC is higher amongst the poor countries and lower amongst the rich countries.

In Fig.3.2 below, the APC and MPC are graphically measured.

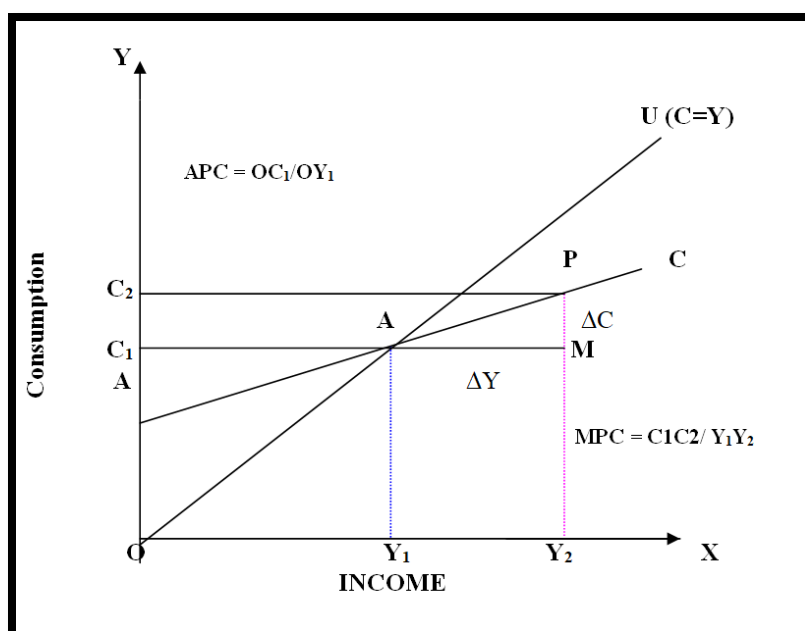


Fig.3.2: The Relationship between APC & MPC.

The APC is measured on a single point on the consumption curve and the MPC is measured by the slope of the consumption curve. You will notice that MPC is the ratio of the vertical length PM to the horizontal length AM.

The relationship between MPC and APC can be explained as follows:

1. When the MPC is constant, the consumption function is linear i.e. a straight-line curve.
2. As income rises, MPC falls but the fall in MPC is greater than the fall in APC.
3. As income falls, the MPC rises. The APC also rises but the rise in APC will be less than the rise in MPC.

The assumption of falling APC is an important part of Keynesian theory of income and employment. Falling APC shows that as income increase, a proportionately larger percentage of national income would be saved. In order to maintain full employment level of income and output, an increasing proportion of national income will have to be invested. However, in the Keynesian scheme of things, aggregate demand is always less than aggregate supply and hence the economy operates always at less than full employment or under-employment level of equilibrium. Keynesian theory of consumption exposes the problem of deficiency in aggregate demand and the emergence of secular stagnation. The theory of secular stagnation put forward by Hansen is based on the diminishing average propensity to consume.

Important Features of the Absolute Income Hypothesis:

The following are the important features of the 'absolute income hypotheses' put forward by JM Keynes:

1. The absolute level of current income determines consumption demand. Consumption demand increases with increase in national income.
2. The marginal propensity to consume is greater than zero but less than one and this is known as the psychological law of consumption.
3. As income increases, the average propensity to consume falls because as the community become prosperous, the average propensity to save increases.
4. The consumption function remains stable in the short period because there is practically no change in the institutional and psychological factors in the short period.

3.3 RELATIVE INCOME HYPOTHESIS

JS Duesenberry, an American economist, put forward the Relative Income theory of consumption. According to him, consumption of an individual is not the function of his absolute income but of his relative position in the income distribution in a society. For instance, if the incomes of all individuals in a society increase by an equal percentage then the relative income remains constant although there is a change in their absolute incomes. Hence, individuals will spend the same percentage of their income on consumption as earlier. The average propensity to consume

remains constant in spite of a rise in absolute income. Empirical studies conducted by Simon Kuznets shows that the APC remains constant in the long run. The relative income theory of consumption differs from the Keynesian theory with reference to the APC. While the Keynesian APC is diminishing, Duesenberry's APC remains constant.

According to the Relative Income Theory, the consumption function curve shifts upward with the increase in the absolute income of the society with relative income distribution remaining constant and hence the APC also remains constant. Duesenberry's theory is depicted in Figure 3.3.

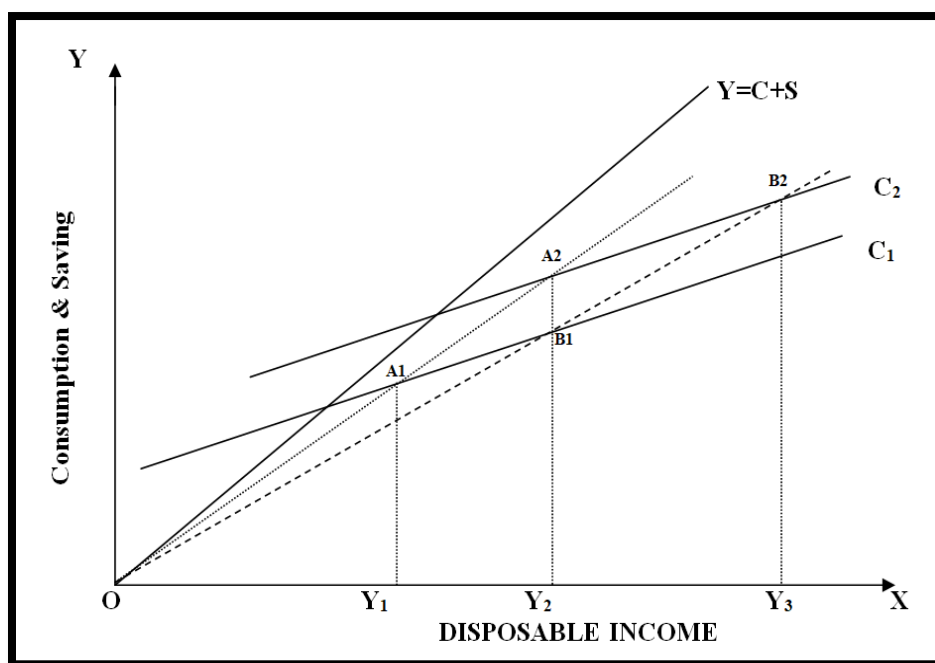


Fig.3.3 – Duesenberry's Relative Income Theory of Consumption.

For instance, Family 'A' has Y_1 level of income and the consumption expenditure is Y_1A_1 . Now when the income level rises to Y_2 , the consumption expenditure rises to Y_2A_2 instead of going up from A_1 to B_1 on the same consumption function curve C_1 . The consumption function curve shifts upward due to a rise in income from Y_1 to Y_2 and since the family maintains a constant percentage of income on consumption expenditure, the new equilibrium consumption expenditure A_2 is not only on the new consumption function curve C_2 but also on the same ray which begins from the point of origin and measures the APC. The fact that points A_1 and A_2 are on the same ray explains constant APC instead of declining APC as propounded by Keynes in his absolute income hypothesis. The same will be true in case of Family 'B' whose consumption expenditure is B_1 at Y_2 level of income and when the income rises to Y_3 , the consumption function curve shifts upward to point B_2 . You may notice that point B_2 is on the same ray as point B_1 indicating a constant Average Propensity to Consume. The Relative Income theory of consumption thus propounds that when the national income increases, the absolute level of consumption expenditure and savings will increase but the relative levels will remain constant.

Demonstration Effect. When individuals and families imitate the consumption pattern of better-off people, their consumption expenditure increases. Such an increase in consumption expenditure is known to have caused by Demonstration or Duesenberry Effect. The constant APC is attributed to demonstration effect in the relative income hypothesis.

Ratchet Effect

When the household income falls, the percentage fall in consumption expenditure is less than the percentage fall in income. This phenomenon is called Ratchet Effect. The Ratchet Effect is caused due to the influence of demonstration effect and the fact that once a certain level of consumption expenditure is achieved with increasing income, consumption expenditure becomes sticky downwards with a fall in income. During a recession or in a period of depression, while the incomes of households fall, their consumption expenditure do not fall to the same extent as income because households continue to maintain the earlier consumption standards by reducing their savings. The Ratchet Effect is shown in Figure 3.4.

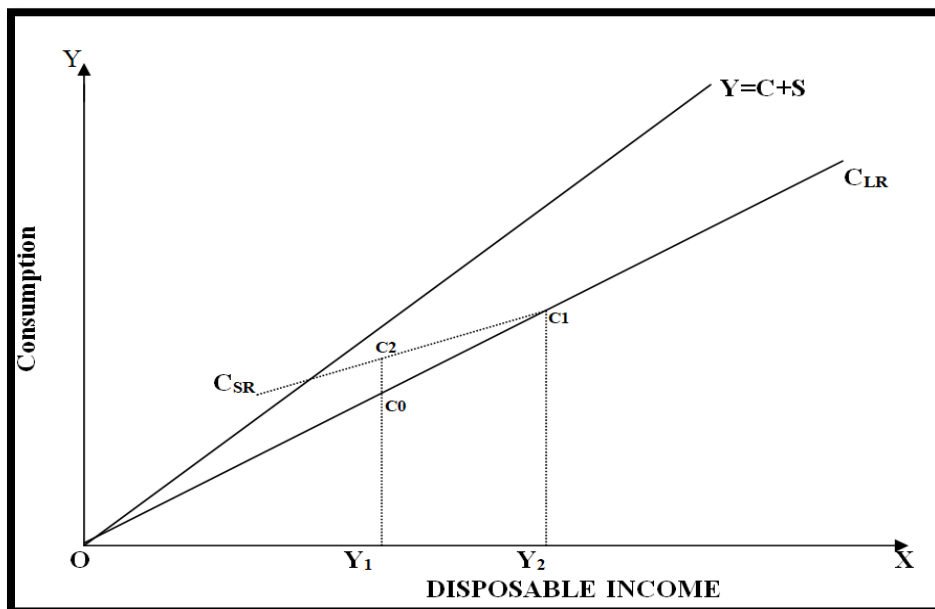


Fig.3.4 – Duesenberry's Ratchet Effect

You will notice that at Y_1 level of income, the consumption expenditure is C_1 . When the income falls to the original Y_1 level, the consumption expenditure does not come down to the original level C_0 on the long run consumption function curve C_{LR} but remains at a higher level C_2 . Joining the points C_1 and C_2 , the short run consumption function curve C_{SR} is derived. During a recession, when income levels fall, the relative consumption expenditure increases and hence the APC is higher than what it was obtained when the consumer was originally at income level Y_1 . The short run consumption function curve C_{SR} also indicates that the consumer will move along the short run curve as the disposable income increases till point C_1 at Y_2 level of income and thereafter will move along the long run consumption function curve C_{LR} as the level of disposable income rises beyond point Y_2 .

Aggregate Consumption Function of the Society

Duesenberry shows us that the relative income of the community determines the consumption expenditure of households instead of the absolute income. Relative income remaining constant, the consumption expenditure as a percentage of income will also remain constant and hence the constant APC when the level of income is rising. However, in times of recession even when the relative income remains constant with a fall in the absolute level of income, the relative expenditure rises leading to a higher APC. These effects on consumption expenditure are explained by the demonstration and ratchet effects. The relative income hypothesis shows us that when income levels rise, there is not much change in the relative income distribution of the community and hence the aggregate consumption curve is linear.

3.4 PERMANENT INCOME HYPOTHESIS

The permanent income hypothesis of consumption function was put forward by the American economist Milton Friedman. According to Friedman, consumption is determined by the long run expected income and not the current level of income alone. The long term expected income is the permanent income according to Friedman. It is the long run average income of the consumer that determines the consumption expenditure. The consumer is rational enough to factor in extra streams of income in addition to the regular income when deciding on consumption expenditure. For example, employees would definitely factor in annual bonus receipts in the average income and accordingly decide the consumption expenditure.

The permanent income is determined by the human and non-human wealth. While human wealth refers to the income received for offering labor services (factor income received by human capital), the non-human wealth is the rate of return on savings and investments made by the household. In Friedman's scheme of savings and investments, financial savings in the money and capital market are included whereas real investment may assume the form of real estate, precious metals and consumer durables such as motor vehicles, refrigerators, air conditioners etc. The imputed value of the flow of services from consumer durables is considered as consumption by Friedman.

Consumption and Permanent Income

According to Friedman, there is a proportional relationship between consumption and permanent income. Symbolically, the relationship between permanent consumption and permanent income can be stated in terms of the following equation.

$$C^P = kY^P$$

Where C^P = permanent consumption
 Y^P = permanent income, and
 k = percentage of income that is consumed.

The percentage of permanent income that is spent on consumption expenditure (k) is determined by the following factors:

1. **Rate of Interest (i).** The rate of interest and saving would have a direct relationship and hence at higher interest rates, the percentage of consumption expenditure would be less and vice versa.
2. **The Proportion of Non-human Wealth to Human Wealth.** Greater the proportion of non-human wealth to human wealth, greater will be the consumption expenditure and vice versa.
3. **Desire to accumulate non-human wealth.** The desire to accumulate non-human wealth or income earning assets and consumption expenditure has an opposite relationship. Greater the desire to accumulate non-human wealth, lesser will be the percentage of permanent income that will be spent on consumption and vice versa.

Now the consumption function based on Friedman's hypothesis can be stated as follows:

$$C^P = k(i, w, u)Y^P$$

Where, i = the rate of interest.
 w = the ratio of non-human wealth to human wealth.
 u = the desire to accumulate non-human wealth.

Permanent and Transitory Income.

Transitory income is temporary in nature. For instance, factory workers receiving overtime allowance for a few months in a year or college professors receiving money on account of examination related work. Friedman says, transitory income does not influence permanent consumption expenditure significantly. Therefore, the total income of a person is the sum of permanent income and transitory income. Symbolically, the total income (m) in a given period may be written as follows:

$$Y^m = Y^P + Y^t$$

Measuring Permanent Income. Permanent income is defined as “the steady rate of consumption a person could maintain for the rest of life given the present level of wealth and income now and in the future.” According to Friedman, permanent income is equal to the last year's income plus a proportion of change in income occurred between the last year and the current year. Permanent income can therefore be measured as follows:

$$Y^P = Y_{t-1} + \alpha (Y_t - Y_{t-1}) \quad 0 < \alpha < 1 \quad \text{..... (1)}$$

$$Y^P = \alpha Y_t + (1 - \alpha) Y_{t-1} \quad \text{..... (2)}$$

Let us assume that the proportion of change in income (α) as compared to the previous year is 0.6 or sixty percent and the previous year's income (Y_{t-1}) is Rs.100 thousand and the current year's income (Y_t) is Rs.120 thousand. The permanent can be estimated by substituting these values in equation (2) above as follows:

$$\begin{aligned} Y^P &= 0.6(120,000) + (1 - 0.6) 100,000 \\ &= 72,000 + 40,000 = 112,000 \end{aligned}$$

When the current and previous year's income are equal, there will be no change in the permanent income. When the current year's income is greater than the previous year's income, permanent rises but is less than the current year's income because the person is not confident about the persistence of the rise in current year's income. Hence, the person will not revise his permanent income by the extent of the rise in current year's income.

Long-run and Short-run Consumption Functions and Permanent Income.

The relationship between consumption and income in both the time periods can be explained as follows:

$$C = kY^P = k\alpha Y_t + k(1 - \alpha) Y_{t-1}$$

In the above equation $k\alpha$ is the MPC in the short run which is less than the long run MPC k and $k(1 - \alpha) Y_{t-1}$ is the intercept of the short run consumption function. The permanent income hypothesis is depicted in Figure 3.5. In this figure, the permanent consumption function is represented by the long run consumption function curve C_{LR} ($C_{LR} = kY^P$). The LR Consumption function shows the proportional relationship between consumption and income and is a linear curve passing through the origin. It means that in the long run, $MPC = APC$ and both are constant. However, the short run consumption function curves are relatively flatter as compared to the LR showing that the SR MPC is lesser than the LR MPC. This is because of the absence of confidence in the persistence of the rise in current income. If the higher income persists in the succeeding year, the individual will raise the permanent income by the full extent of the rise in income in the previous year.

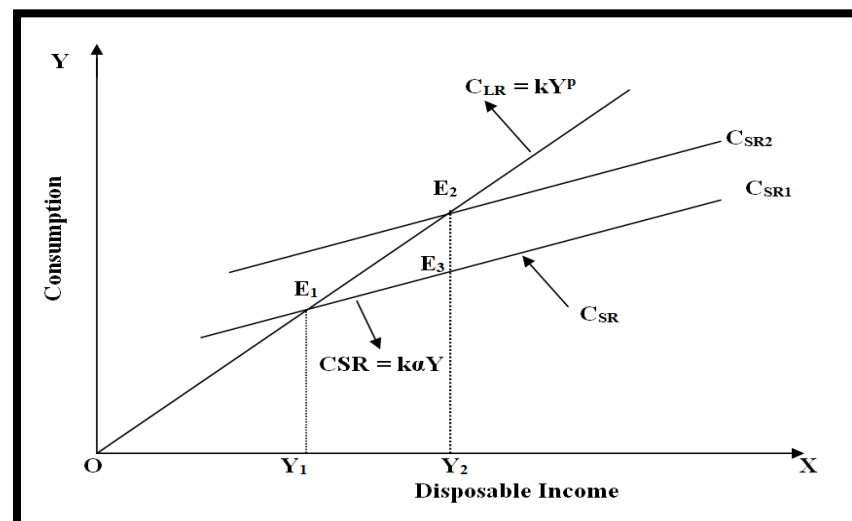


Fig.3.5 – LR & SR Consumption Functions & Permanent Income

3.5 LIFE CYCLE THEORY OF CONSUMPTION

Ando A and Modigliani F put forward the 'Life Cycle Theory of Consumption'. According to these economists' consumption is the function of the expected life-time income of an individual. It is assumed that individuals maintain a progressively increasing level of consumption as expected life-time income increases. When a person enters the labor market at age 15, the consumption expenditure is greater than income through age 25 and therefore there is dis-saving during this period. These dis-savings are funded by borrowing. During the period between age 25 and age 65, the person's consumption expenditure is less than income and savings are made. These savings are invested in assets. Post-retirement i.e. after age 65, the consumption expenditure is greater than income and once again the dis-savings are funded by the savings made by the individual during the prime years of his life (25 to 65). The Life Cycle Hypothesis is depicted in Figure 3.6. The life expectancy of the individual is assumed to be 75 years and life-time net savings are assumed to be zero because savings of the individual are equal to the dis-savings. The individual earns zero income on the assets owned. The YY curve shows the life-time pattern of income and the CC curve with a gradually rising slope shows that the consumption expenditure increases with the increase in age and life-time expected income.

Since the net life-time savings are zero, area AHB denoting savings is equal to the sum of the areas CYA and CYB denoting dis-savings ($AHB = CYA + CYB$).

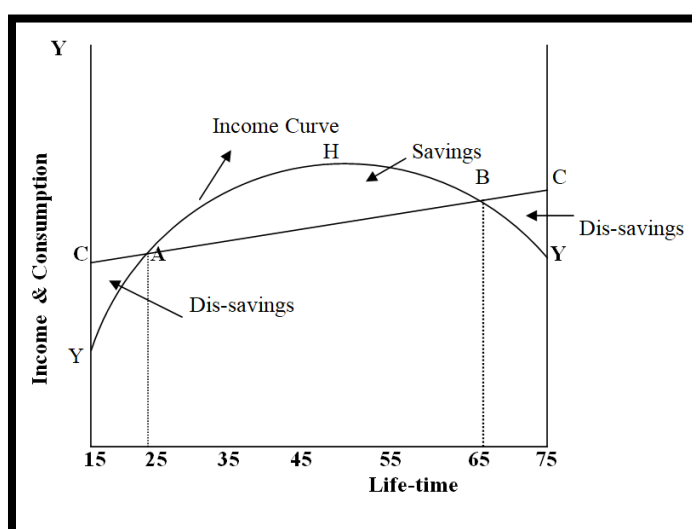


Fig. 3.6 – Life Cycle Theory of Consumption.

The life cycle theory of consumption can be explained with an equation. Let us assume a person of a given age with an additional life expectancy of T years and retires after working for N years. The person consumes a constant proportion of his life time income $1/T$ in each year of life. Now the equation can be stated as follows:

$$C_t = \frac{1}{T} (Y_{Lt} + (N - 1)Y^e_L + W_t)$$

Where, C_t = Consumption expenditure in the current period 't'.

Y_{Lt} = Income from labor in the current period 't'.

$N - 1$ = Remaining years of work.

Y^e_L = Average annual income expected from $N - 1$ years.

W_t = Current stock of wealth.

The consumption behavior expressed under the hypothesis can be expressed in the following functional form:

$$C_t = b_1 Y_{Lt} + b_2 Y^e_L + b_3 W_t$$

Where, b_1 = MPC of current income.

b_2 = MPC of expected life-time income.

b_3 = MPC of wealth.

Consumption would not change much in response to changes in current income and that consumption would change significantly if there is positive change in the expected life-time income (Y^e_L). A one-time change in income will be spread equally on consumption over the balance of the person's life time. For instance, an increase of one-time income by Rupees 120,000 at age 25 would change consumption expenditure by Rs.200 per month over the balance life of 50 years. In that case the consumption function curve will shift upwards. However, if the change in income is persistent, the consumption effect will be large and persistent. The same will be the case if there is an increase in the stock of wealth.

Ando and Modigliani in their study of consumption function in the US assumed that the expected future life-time labor income is a multiple of current labor income. Symbolically, the expected future life-time income of a person can be stated as follows:

$$Y^e_L = \beta Y_{Lt}$$

Here, β is a multiple of current labor income (Y_{Lt}) which is subject to revision as current labor income changes. Accordingly, aggregate consumption function of the community can be stated as follows:

$$C_t = (b_1 + b_2\beta) Y_{Lt} + b_3 W_t$$

Based on time-series data pertaining to the United States, the following estimates were obtained by the two economists:

$$C_t = 0.72 Y_{Lt} + 0.06 W_t$$

According to the above estimates, if current labor income increases by Rupees 1000 and given the effect on expected future income, consumption will increase by 720 (0.72×1000) per period and if the stock of wealth increases by Rupees 1000 and with its given effect on expected future

income, consumption will increase by Rs.60/- (0.06×1000). Thus, according to the life cycle hypothesis, relationship between income and consumption is non-proportional.

The consumption function based on Ando and Modigliani hypothesis is depicted in Figure 3.7. In this figure, the short run consumption function curve is C_{SR} and the marginal propensity to consume out of labor income is 0.6 or 60 per cent. The short run consumption function is linear and intercepting the Y-axis to indicate that the APC will decline as labor income increases and $MPC < APC$. The Y-intercept of the short run consumption function measures the effect of wealth on consumption and as the stock of wealth grows in the long run the intercept will shift upwards. The shift in the short run consumption function overtime will trace a series of points on the long run consumption function C_{LR} .

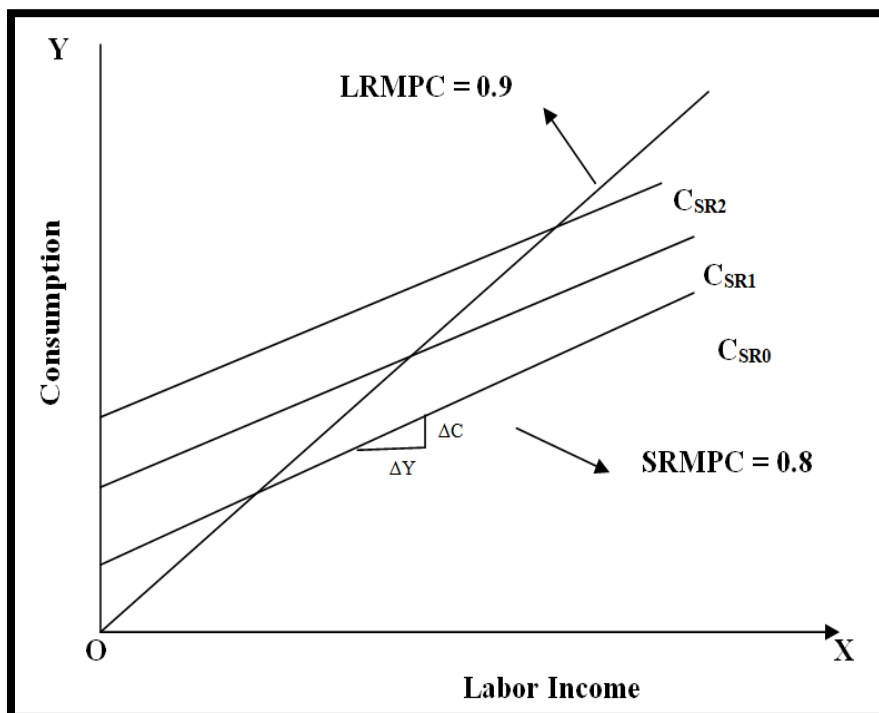


Fig.3.7 – Life Cycle Income & Consumption in both the time periods.

Criticisms

According to Gardner Ackley, as per the life cycle hypothesis, in making consumption plans, households seem to have a definite and conscious vision. Ackley says that the vision is unrealistic. It is not only the future expected income but a number of other factors influence consumption, such as life expectancy of other family members and their expected incomes, unforeseen events etc. The availability of liquidity in the financial markets also has a bearing on consumption and liquidity constraints will definitely change the consumption function. In such a situation, the current income will have a greater bearing on consumption than the life-time expected income of the consumer.

3.6 QUESTIONS

1. Explain the Absolute Income hypothesis of consumption function.
2. Explain the Relative Income hypothesis of consumption function.
3. Explain the permanent income hypothesis of consumption function.
4. Explain the life cycle income hypothesis of consumption function.
5. Compare the permanent income and life cycle income hypotheses of consumption function.
6. Compare the absolute and relative income hypotheses of consumption function.

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INVESTMENT ANALYSIS

Unit Structure:

- 4.0 Objectives
- 4.1 Introduction
- 4.2 Determinants of Investment.
- 4.3 Marginal Efficiency of Capital
- 4.4 Rate of Interest, MEC and Investment Demand
- 4.5 Profit Expectations and Shift in Investment Demand Curve
- 4.6 Role of Expectations and MEC
- 4.7 Measures to Stimulate Private Investment
- 4.8 Limitations of MEC
- 4.9 Questions

4.0 OBJECTIVES

- To study investment and its types
- To understand various determinants of investment
- To understand the concept of Marginal efficiency of Capital (MEC)
- To understand the concept of Supply Price of Capital (SP)
- To study the meaning of Prospective Yield of Capital

4.1 INTRODUCTION: INVESTMENT

Investment in economics refers to real investment. Real investment increases the productive capacity of the economy. Any investment in creation of economic and social infrastructure will increase the productive capacity of the economy. Construction of dams and canals, electricity generation plants, communication facility, setting up of new factories and plants, expansion of existing factories and plants, setting up new transport system and expansion of existing transport systems, building of new expressways and bridges across land and water, construction of new airports, educational institutions and hospitals etc – all these and more increases the productive capacity of the economy and thus they constitute real investment in the economy. Financial investment in the primary market is used to expand the scale of business and hence it qualifies to be real investment. However, financial investment in the secondary market only leads to change in ownership of the initial capital invested. It does not constitute new investment in the economy. New real investment in the economy generates additional employment, output and income and in turn

raises the level of aggregate demand and national income in the country or the economy.

Joan Robinson says, “By investment is meant addition to capital such as occurs when a new house is built or a new factory is built. Investment means making an addition to the stock of goods in existence.” Setting up of new financial institutions and their branches across the country or expansion of existing financial institutions would also increase the availability and mobility of financial capital and thereby increase the productive capacity of the economy. To conclude, any investment that increases the productive capacity of the economy is investment in economics.

4.1.1 Types of Investment

In economics, we talk about two types of investment. They are induced and autonomous investments. While induced investment is profit motivated, autonomous investment is not. Induced investment is a function of income and profit or the marginal efficiency of capital which is the rate of return on investment. Higher the level of income, lower the rate of interest and higher the MEC, higher will be the level of induced investment. Induced investment is therefore a direct function of income and MEC and an opposite function of rate of interest. During the expansionary phase of the business cycle, national income and aggregate demand increases. As a result, induced investment also increases.

Autonomous investment is not related to the level of income, profitability and rate of interest. For instance, investment made by the government in creating social and economic infrastructure is autonomous in nature. It is called Social Overhead Capital (SOC) and generally all SOC is publicly funded. Similarly, investment in research and development is autonomous in nature because the return on such investment is not only uncertain but also long term in nature. Autonomous investment is depicted in Figure 4.1.

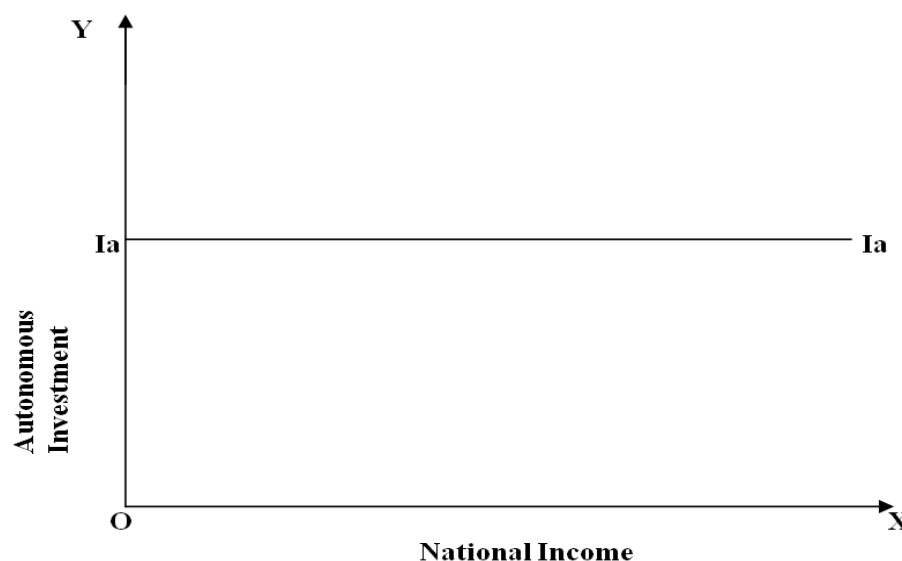


Fig. 4.1 – Autonomous Investment.

The autonomous investment curve is horizontally sloping indicating that the demand for autonomous investment is perfectly elastic and independent of the level of national income.

The demand for induced investment is a function of the level of national income, the rate of interest and the MEC or the rate of return on investment. Holding the rate of interest to be constant, induced investment will be a direct function of the level of national income and the profitability of investment. Thus, higher the level of national income and higher the profitability, the level of induced investment will be high. Induced investment is depicted in Figure 4.2. Notice that the II curve has a positive slope.

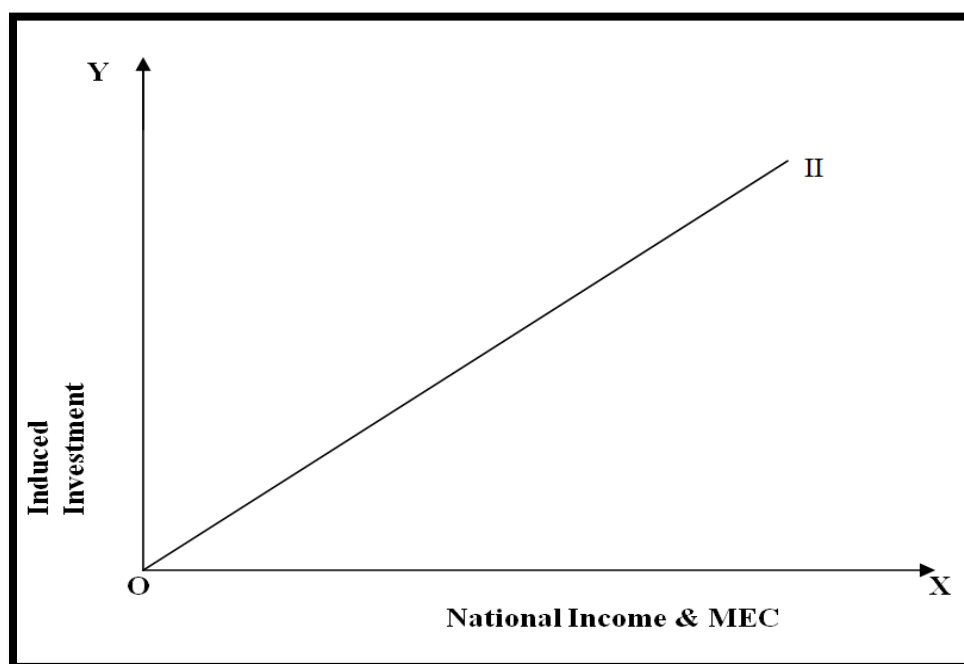


Figure 4.2 – Induced Investment

The functional relationship between induced investment, the level of national income and the profitability of investment can be symbolically stated as follows:

$$II = f(Y, \pi)$$

Where, II is the amount of induced investment, Y stands for the level of national income and π stands for profitability of investment or the rate of return on investment which is also the marginal efficiency of capital.

The Average and Marginal Propensity of Induced Investment.

The Average Propensity of induced investment is the ratio of induced investment to the level of national income. Symbolically, $APII = II/Y$. For instance, if the level of national income is Rs. Three hundred trillion and induced investment is Rs. 75 trillion, then the APII will be $75/300 = 0.25$. It means, 25 % of the national income will be invested.

The Marginal Propensity of induced investment is the ratio of change in induced investment to the change in the level of national income. Symbolically, $MPII = \Delta I / \Delta Y$. Thus if the national income increases to Rs. 330 trillion and induced investment goes up by Rs. Six trillion, then the MPII will be $6/30 = 0.2$ or twenty per cent of the additional income will be invested.

4.2 DETERMINANTS OF INVESTMENT

The most important factor that determines investment is the marginal efficiency of capital (MEC). MEC takes into considerations three important factors such as the cost of capital asset that is sought to be acquired, the rate of interest that will be paid to the financial institutions for funding the asset and the return on investment or the profitability of investment. The decision to invest will be taken if the rate of return is greater than the rate of interest. The concept of MEC is discussed in details in the succeeding paragraphs. Other factors which determine investment are the marginal efficiency of investment (MEI), uncertainty, current stock of capital goods, level of national income, consumer demand, liquid assets, inventions and innovations, new products, population growth, government policy and the business environment. These factors are explained below.

1. **Marginal Efficiency of Capital.** The MEC is the expected rate of return over the life-time of the capital asset acquired. The replacement cost of the capital asset, interest paid on the capital asset acquired and the maintenance cost of the capital asset constitute the total cost. If the total return over the life-time of the capital asset is greater than the total cost, investment will be profitable i.e. if the MEC is greater than the total cost of capital, new investment will take place in the economy. The return on investment is the revenue generated by producing goods and services with the help of the acquired capital asset. While calculating the replacement cost of the capital asset once the life is completed, it is the future cost which must be considered as the future cost may be higher than the historical cost on account of inflation.
2. **The Marginal Efficiency of Investment.** The MEI is the rate of return expected from a given investment on a capital asset minus the cost except the rate of interest. The MEI also equates the supply price of a capital asset with its prospective yield over the life time like MEC. Investment in the capital asset will be made if the rate of interest is less or equal to the rate of return on investment. Investment and rate of interest has a negative relationship i.e. at a low interest rate, investment demand will be high and vice versa. The amount of investment made also depends upon the interest elasticity of investment demand. If the investment demand is elastic, a small fall in the interest rate would lead to a big rise in the investment demand and if the investment is inelastic, a big fall in the interest rate would lead to small rise in investment demand. Thus when the percentage change in the amount of investment made is higher than the

percentage change in interest rate, investment demand is said to be elastic and vice versa. The relationship between elasticity of investment demand and the rate of interest is shown in Figure 4.3.

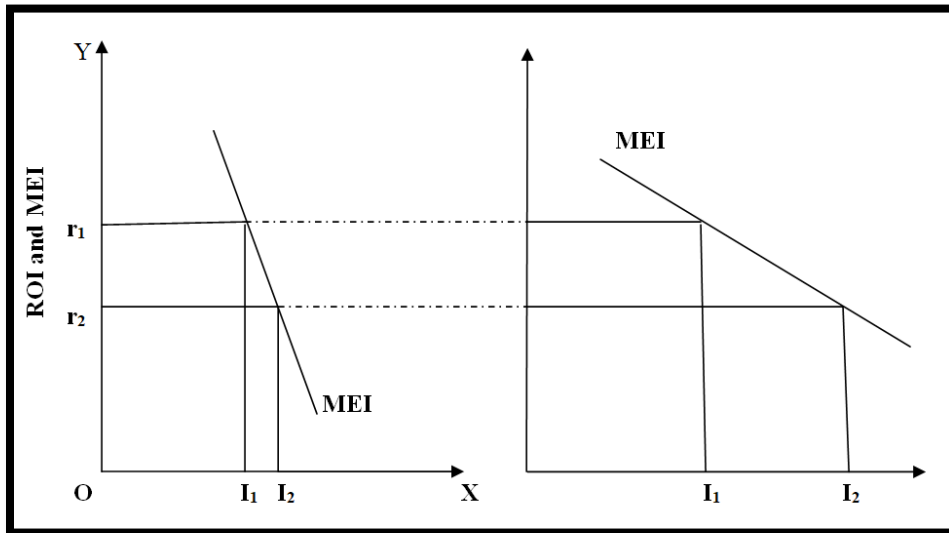


Fig.4.3 (a) $IEID < 1$

(b) $IEID > 1$

At the given rate of interest, if the MEI increases, the MEI curve will shift to the right and the investment demand will increase. This is shown in Figure 4.4.

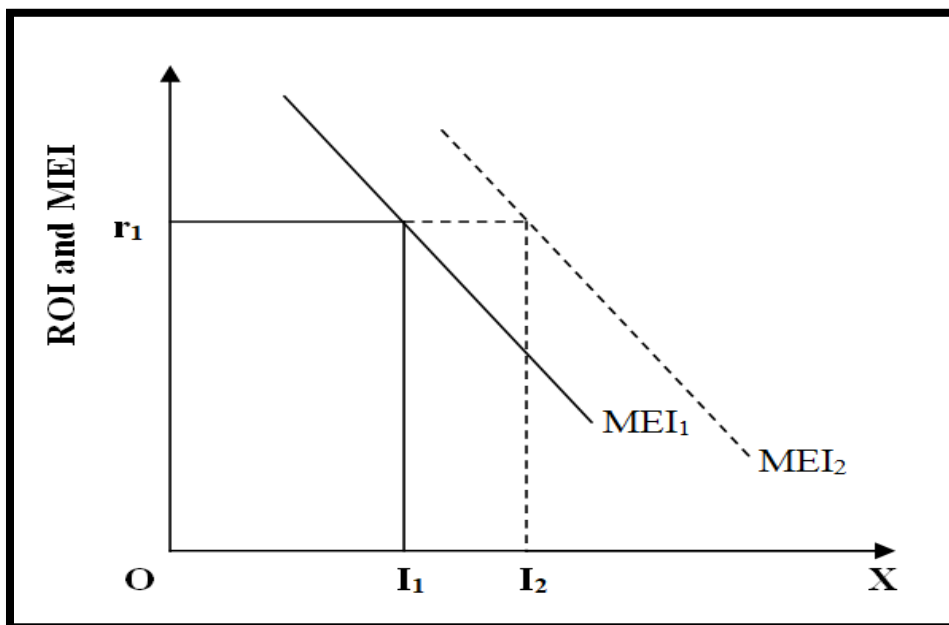


Fig. 4.4 – Shift in the Investment Demand Curve

3. **Business Uncertainty.** According to Keynes, the MEC is more fluctuating than the rate of interest because the prospective yield of capital depends upon business expectations. Business expectations may also fluctuate wildly due to rumor mongering and unfounded optimism. Long period predictions may not materialize and according

to Keynes we are all dead in the long run. Hence, investment projects have a short pay-off period. The rate of obsolescence of capital assets may increase due to rapid changes in technology, inventions and innovations. As a result, provisions to depreciation may increase and firms would want to recover the capital cost in a short period. Sometimes the MEI curve may shift to the left after a fall in the rate of interest. This is definitely due to business pessimism. It is the rate of return on investment which is the important factor and not the rate of interest. Business uncertainty is therefore more of a psychological phenomenon which brings about changes in the inducement to invest or investment demand in the economy.

4. **Existing Stock of Capital Goods.** If the inventory of capital goods is high, there will be little or no inducement to invest. However, if the industry is working to its full capacity, a higher demand for consumer goods will increase the demand for capital goods and therefore there will be more investment in the economy.
5. **Level of National Income.** If the nominal national income increases in the economy due to factor cost inflation, the general price level will rise and the MEC will increase. A higher MEC will lead to higher level of investment in the economy. The MEC increases because of a time lag in compensating factors of production for the price rise, particularly labor. The same will be the case when there is a real rise in the national income.
6. **Consumer Demand.** If the demand for consumer goods rises in the current period, businesses would expect a continued rise in future demand too. Hence the rate of investment will increase.
7. **Liquid Assets.** When enterprises and investors possess large liquid assets particularly when they have large reserves and surpluses, the inducement to invest will be high. Thus the existence of large liquid assets will have a positive impact on the inducement to invest and therefore investment demand in the economy.
8. **Inventions and Innovations.** Inventions and Innovations lead to increase in the marginal efficiency of capital. Any invention or innovation that increases efficiency of factor inputs will reduce the cost of production and hence the MEC will increase. Hence with inventions and innovations, the inducement to invest will increase leading to higher level of investment demand.
9. **Introduction of New Goods and Services.** When new goods and services are introduced in the economy the demand for them is high. High demand will increase the MEC and therefore the inducement to invest.
10. **Population Growth.** The demand for goods and services will rise due to growth in population. A high growth in population will cause higher demand for goods and services which in turn will increase the demand for investment goods. In a poor developing economy even if

there is no population growth but the rate of increase in real national income is high and sustained, the profitability of investment will increase and there will be a sustained increase in investment demand in the economy.

11. **Government Policy and Economic System.** In a free market economy, the animal spirits can be unleashed to the fullest extent and the economy may as compared to mixed and command economies, generate a much higher level of growth in national income. The inducement to invest will always be higher in free economies than in mixed and command economies. Further, if the government wishes to promote private investment, it may reduce both income and corporate taxes. While lower income taxes will lead to a higher demand for consumer goods, lower corporate taxes will increase the profit after taxes of the corporate sector and there will be more investment in the economy.
12. **Political Environment.** Political stability is important for keeping the animal spirits high. Strong and stable governments will promote the necessary optimism in the economy to raise the level of investment on a sustained basis. Irrespective of the political system that is adopted by a country, political stability assumes importance. Monarchies and command economies can also be unstable. Similarly military or civilian dictatorships can also be instable. There can be threat of a coup in these types of political systems. A democracy may also produce an unstable government if the political party in power does not have majority in the legislature. Unstable governments will detract investors from investing in the economy whereas stable and strong governments even if they last only for their full term (for instance, five years in India) will provide the necessary incentive and inducement to invest.

4.3 MARGINAL EFFICIENCY OF CAPITAL

Marginal Efficiency of Capital means the expected rate of profit. Marginal Efficiency of a given capital asset is the highest rate of return over the cost expected from additional unit of that capital asset. According to Kurihara, the MEC is the ratio between the prospective yields of additional capital assets and their supply price. Symbolically, the MEC can be stated as follows:

$$e = Q/P$$

Where 'e' = Marginal Efficiency of Capital.

Q = Prospective or expected rate of return of a capital asset per unit of time.

P = Supply price of the capital asset.

Thus the marginal efficiency of capital depends upon two factors. They are the prospective return from the capital asset and the supply price of the capital asset. **Prospective yield** or return refers to the rate of return an

investor expects to obtain from selling the output obtained from his capital asset during its life time. It is the life time total net return of a capital asset. By dividing the total expected life of a capital asset into a series of annuities represented by $Q_1, Q_2, Q_3 \dots Q_n$, we obtain the prospective yield of investment. The supply price of the capital asset is the replacement cost of the asset. Thus, the MEC of a capital asset is the rate at which the prospective yield expected from one additional unit of the asset must be discounted if it is just equal to the supply price of that asset. The equality between the **supply price of a capital** asset and the discounted presented value of a series of annuities over the life time of the capital asset can be stated as follows:

$$SP = \frac{Q_1}{(1+e)} + \frac{Q_2}{(1+e)^2} + \frac{Q_n}{(1+e)^n}$$

Where; SP is the supply price of the capital asset. Q_1, Q_2, Q_n are a series of anticipated annual returns or the prospective yields of the capital assets in the years 1, 2..n respectively and e is the rate of discount or the MEC. The term $Q_1/(1+e)$ represents the current value of the annuity receivable at the end of the first year discounted at the rate e . If the rate of discount is assumed to be 10 per cent, Rs.100/- expected to be received a year later is worth Rs.90.91 now. It means that Rs.90.91 currently invested at 10 per cent will become Rs.100 a year later. Let us assume that the life of a capital asset is three years. If the current supply price of the asset is Rs.9601 and if its life is three years then 5% must be rate of discount which would make the sum of discounted values of the prospective annual yields equal to the supply price of the capital asset. It means that the MEC is 5%. This is shown below:

$$\begin{aligned} \text{Rs.9601} &= \frac{2100}{(1.05)} + \frac{1764}{(1.05)^2} + \frac{6946}{(1.05)^3} \\ &= \text{Rs.2000} + \text{Rs.1600} + \text{Rs.6001} \\ &= \text{Rs.9601/-} \end{aligned}$$

If the prospective yields are less than the figures given above, the discount rate will be less than 5% so as to equate the discounted prospective yields to the supply price. Further, if there is a decline in the prospective yields, there would be a fall in the rate of discount. If the supply price of the capital asset is more than Rs.9601, the rate of discount would be lower, assuming the yields remain constant. Thus when the net prospective yield is more than the supply price, there would be an inducement to invest. The volume of investment depends upon the current supply price of the capital asset and its demand price i.e. it depends upon the MEC and the rate of interest.

4.3.1 Factors Affecting Marginal Efficiency of Capital

Investment keeps changing according to changing business environment. Fluctuations in investment cause changes in aggregate demand. Investment

demand depends upon MEC or the expected rate of profit and the rate of interest. The factors that affect marginal efficiency of capital are as follows:

1. **Expectations.** Keynesian theory gives importance to profit expectations of businessmen for determining marginal efficiency of capital and investment in the economy. Keynes said that it was not possible to make rational calculations about the future profitability of investment. Swings of optimism and pessimism of the business class determines investment. These irrational swings were termed as Animal Spirits by Keynes. According to Keynes, the animal spirits determine investment by business firms.
2. **Expected Demand for Products.** Expected net return on investment by a business firm depends on the anticipated demand for its product. For the economy, the marginal efficiency of investment depends upon consumption expenditure of households on the products produced in the economy. The consumption expenditure in turn depends upon income, propensity to save, price level, rate of interest, stock of wealth, taxation policy etc. Changes in these factors would cause a change in consumption expenditure and demand for the products.
3. **Technology and Innovation.** Technological change and introduction of new products and processes are important determinants of investment. The introduction of new technology and new products requires building up new plants which in turn increases investment in capital goods industry. Further advances in technology and new inventions make investment more productive. Increase in productivity of capital induces more investment at the given rate of interest and the MEC curve shifts to the right.
4. **User Cost of Capital.** The user cost of capital affects the rate of return on capital. It depends on the real rate of interest, rate of depreciation, corporate income taxes etc. The lower these rates, the lower will be the user cost of capital and higher will be the rate of return on capital, thus increasing investment and vice versa.
5. **Monetary Policy and Credit Availability.** The availability of credit also determines investment in the economy. Investment may be financed in three ways i.e. borrowing from banks and financial institutions, issuing equity capital and using reserves and surpluses. Credit availability depends upon the economic conditions and the monetary policy pursued by the Central Bank. Under inflationary conditions, a tight monetary policy will be pursued by the Central Bank and credit availability will be low and vice versa. Thus under inflationary conditions, credit availability will be low, interest rate will be high and investment demand will be low.
6. **Fiscal Policy.** In order to finance higher government expenditure, if the government borrows money from the open market, it will raise the interest rate and crowd out private investment. The effect will not be the same if the Central Bank pursues an expansionary monetary policy with the government pursuing an expansionary fiscal policy.

However, if the additional government expenditure is productive in nature, it will generate more employment, income and demand thus crowding in private investment or helping private investment to rise.

4.4 RATE OF INTEREST, MEC AND INVESTMENT DEMAND

The marginal efficiency of a capital asset will decline as more and more investment is made in it i.e. the marginal efficiency of a given capital asset will be sloping downward as the stock of capital asset increases. This happens because the prospective yield from capital asset fall as more units of capital are installed and used for production of a commodity. Prospective yield decline because when more quantity of a good is produced with greater amount of capital assets, prices of goods fall. Further with more demand for capital assets, the supply price of capital assets rise. The marginal efficiency of capital can therefore be represented by a downward sloping curve which is shown in Fig. 4.5 below. In Fig. 4.5, investment in capital assets is measured along the X-axis and the rate of interest and marginal efficiency of capital is shown on the Y-axis. You will notice that when investment in capital asset is OI_1 , the MEC is i_1 . When the investment is increased to OI_2 , MEC of the capital asset falls to i_2 .

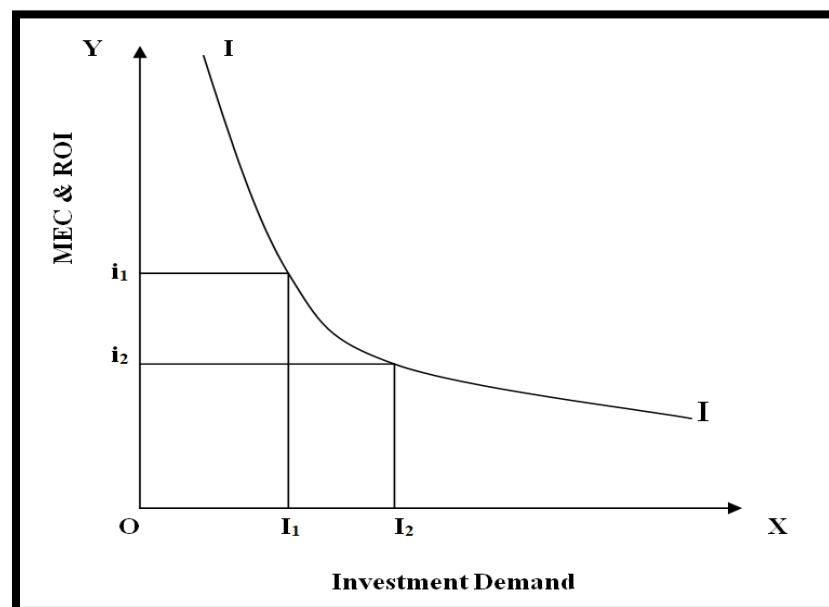


Fig. 4.5 - The MEC Curve

You will notice that the inducement to invest depends upon the MEC and the rate of interest. Given the rate of interest and the MEC, the equilibrium level of investment in the economy can be determined. The equilibrium level of investment will be established at the point where MEC is equal to the given current rate of interest. Thus, if the rate of interest is i_1 , OI_1 investment will be undertaken because at OI_1 level of investment, MEC is equal to the rate of interest i_1 . If the rate of interest falls to i_2 , investment in capital assets will rise to OI_2 because at OI_2 level of investment, the new rate of interest i_2 is equal to the MEC. Thus, the MEC curve shows demand

for investment at various interest rates. The MEC curve, therefore, represents the investment demand curve. This curve shows how much investment will be undertaken by the firms at various rates of interest. If the investment demand curve is relatively inelastic, proportionate rise in investment demand will be less than the fall in the rate of interest. And if the investment demand curve is relatively elastic then a given fall in rate of interest will result in a more than proportionate change in investment demand.

4.5 PROFIT EXPECTATIONS AND SHIFT IN INVESTMENT DEMAND CURVE

The MEC depends upon the supply price of capital and the prospective yields of capital asset. The prospective yields are influenced by the changing profit expectations of firms. The level of investment is actually determined by the profit expectations of firms. If profit expectations are poor, investment demand will be low and the MEC will also be low. In contrast when profit expectations are good, investment demand raises leading to higher levels of employment and income. With change in profit expectations, the MEC curve shifts i.e. when profit expectations are good, the MEC curve shifts to the right and vice versa. Fig.4.6 below shows shift in the investment demand curve as a result of change in profit expectations. You will notice that the rate of interest remaining constant, when profit expectations are poor, the investment demand curve II shifts downwards or to the left to become I_1I_1 i.e. investment demand falls from OI to OI_1 and when profit expectations are good, the investment demand curve shifts to the right to become I_2I_2 and investment demand rises from OI to OI_2 . Downward shift in the marginal efficiency of capital curve indicates that at the given rate of interest, less investment will be undertaken than before and vice versa.

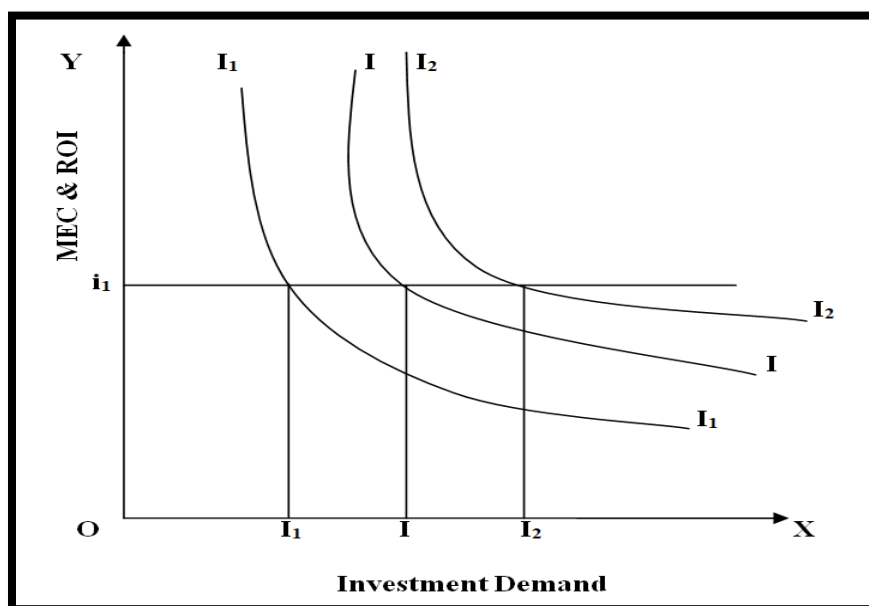


Fig.4.6: Shifts in the MEC Curve

It can be concluded that the volume of investment depends upon the marginal efficiency of capital and the rate of interest. If the rate of interest is higher than the marginal efficiency of capital, new investment will not be profitable and entrepreneurs will be interested in lending capital and enjoy the high interest rate rather than investing in capital assets and obtain a return lower than the rate of interest. Similarly, if the rate of interest is lower than the marginal efficiency of capital, the entrepreneurs will invest more in physical assets i.e. invest in productive activities and earn more profits. Thus the equilibrium level of investment is possible only when the marginal efficiency of capital is equal to the current rate of interest.

The rate of investment also depends upon the rate of interest. With the marginal efficiency of capital remaining constant, the rate of interest falls, investment demand will rise and vice versa. However, in the short run, the interest rate is more or less stable but not the marginal efficiency of capital. The market forces will bring the two rates to equality in due course because when the MEC is higher than the rate of interest, investment demand will raise leading to higher interest rates. This process will continue till the two rates become equal.

4.6 ROLE OF EXPECTATIONS AND MEC

Changes in the inducement to invest depend upon changes in the marginal efficiency of capital. The prospective yield of capital is nothing but the expected return on capital which greatly influences MEC and investment demand. In free economies, the prospective yield of capital asset is unstable and hence investment is guided by expectations of firms. Keynes emphasizes the role of expectations and uncertainty in the determination of the volume of income and employment. According to Keynes, there are two types of expectations regarding the return on capital assets. These are short term and long term expectations. The entrepreneurial class has to make two important decisions. One concern with the extent of use of plant capacity in producing the output and the second decision is regarding expansion of plant capacity after full utilization. There are a number of factors which influences the present and future decision making of the entrepreneurial class. These factors relate to the short and long term expectations.

1. **Short Term Expectations.** Short run expectations are based on past experiences. Factors such as price, wage levels, employment, interest rate, money supply etc pertaining to the immediate past influence present decision making. The business class in the short run is interested in utilizing its present plant capacity. Accordingly, short term expectations would include the expected demand for a product of a firm when it is ready for sale and the behaviour of factor prices in determining the cost of production in the short run.
2. **Long Term Expectations.** These expectations are concerned with return on output in the long run when firms expand their scale of output. These expectations relates to the size of future demand for a

product generated by a capital asset over its lifetime and the cost of producing the output over the lifetime of the capital asset. While the short term expectations of prospective yields are relatively stable, the long term expectations are not. The changes in the long term expectations cause business fluctuations in a capitalist economy because the changes in real investment are due to the changes in expectations of prospective yields from current investment. These fluctuations in turn affect employment, output, income and demand in the economy. There are events which cannot be predicted accurately in the current period. For instance, the life of a new plant cannot be accurately predicted because technological changes in the industry can render the existing plants obsolete. Similarly, the future demand for products, **competition**, prices, possibilities of war, natural calamities, change in government and its policies etc cannot be adequately and accurately predicted in the present period. The secrecy of future leads to speculation in the present and cause fluctuations in investment. However, there will be always people who would believe and claim to know better than others. These people can be classified into two categories namely, pessimists and optimists. While the pessimists will withdraw investments, the optimists will scale up investments. Yet small flutters in the economy can cause big swings in the investment climate leading thereby to business fluctuations. Thus, a climate of pessimism will reduce the prospective yields and thereby the marginal efficiency of capital will fall and that of optimism will increase the prospective yields and thereby the marginal efficiency of capital will rise.

A sustained rise in the marginal efficiency of capital will signal the prosperity phase of the business cycle and similarly a sustained fall in the marginal efficiency of capital will indicate a recession in the economy. Thus, both booms and busts are caused by changes in the marginal efficiency of capital.

4.7 MEASURES TO STIMULATE PRIVATE INVESTMENT

The following measures are suggested to stimulate private investment:

1. **Reduction in Interest Rate.** The Central Bank of a country can reduce the interest rate to stimulate private investment. However, if the marginal efficiency of capital is very low, reduction in interest rate would not be effective in stimulating private investment.
2. **Fiscal Policy.** Fiscal policy relates to the income and expenditure of the government. In order to stimulate private investment, the government can implement an expansionary fiscal policy. In that, the government may either reduce income and corporate taxes or spend more by borrowing from the banking system. A reduction in income tax will increase the discretionary income of the tax payers and thereby increase aggregate demand and a reduction in corporate taxes will increase the profits of firms and thereby stimulate private investment.

3. **Public Works Program.** Massive public works program all over the country can stimulate private investment in a recession because it generates fresh employment, income and demand. Rise in aggregate demand for consumption goods will stimulate private investment in the consumption goods industry and thereafter in the capital goods industry.
4. **Reduction in Money Wages.** A reduction in the money wages will increase the marginal efficiency of capital. However, reduction in money wages is possible only under two conditions i.e., the existing wage is much higher than the subsistence wages and that the workers are not unionized. Unionized workers will not accept reduction in wage rates and if the existing wage rates are at subsistence level, a further reduction will only impoverish them thereby reducing their abilities to work and also there will be a big reduction in aggregate demand for consumption goods. Reduction in money wages is therefore not a very desirable idea to stimulate private investment.
5. **Price Policy.** Price stability should be maintained by the government through appropriate monetary and fiscal policies. Stable prices will lead to controlled speculative activity and sustained rise in investment.
6. **Improved Techniques of Production.** New and improved techniques of production across the economy or in the major sectors of the economy will not only stimulate private investment by making the existing machinery obsolete but also increase the marginal efficiency of capital.
7. **Curbing Monopolies.** While monopolistic markets are a reality and must be accepted, the government should make every effort to dissuade monopolies from coming into existence. Competitive conditions will always stimulate private investment and increase consumer choice.
8. **Public Investment.** Under a depression, monetary policy is not at all effective in stimulating private investment. Thus, compensatory public spending as advocated by Lord Keynes is a good solution. When the government makes investment in infrastructure projects, the external economies arising out of infrastructure projects will inspire private investment, employment, output, income and demand in the economy.

4.8 LIMITATIONS OF MEC

The concept of Marginal Efficiency of Capital is criticized by various economists on the following grounds:

1. **MEC is Dynamic in nature and Interest is Static.** MEC is assumed to be dynamic even in the short run and interest rate is assumed to be more or less static. However, both MEC and the interest rate are influenced by expectations. When the rate of interest is expected to

be high, demand for money would be high and when the rate of interest is expected to be low, demand for money would be low.

2. **Conceptual Problem.** According to Saulnier, the use of the concept of marginal efficiency of capital pre-supposes a whole structure of distribution theory which would enable us to distinguish and evaluate the combination of all productive factors. Keynes has not considered this conceptual problem adequately.
3. **Wage Rate.** In analyzing investment function in relation to the rate of interest and marginal efficiency of capital, the wage rate is assumed to be equal to the marginal productivity of labor. In reality, the wage rate need not be equal to the marginal productivity. In that case, wage rate will influence the marginal efficiency of capital.
4. **Economies and Diseconomies of Scale.** Both the economies and dis-economies of scale have not been considered by Keynes while analyzing the concept of Marginal Efficiency of Capital. Economies of scale will reduce the cost of production and influence the MEC, while diseconomies of scale will increase the cost of production and increase the MEC.
5. **Aggregate Investment Demand Schedule.** Lord JM Keynes has not given sufficient thought on the factors determining an aggregate investment demand schedule. Changes in the amount of capital, quantity and quality of labor, improved methods of production, availability of natural resources etc do influence MEC.
6. **The Conditions in Underdeveloped Countries are Different.** Keynes assumed that firms can estimate the future profitability of present investment. Accordingly, the governments of advanced countries may suitably change their monetary and fiscal policies to suit profitability of investment. However, in underdeveloped countries, the government has to create sufficient social and economic overhead capital to generate external economies and influence the marginal efficiency of capital.
7. **Public Investment.** Prof. Hazlitt criticizes Keynesian advocacy of interventionist fiscal policy during the times of reduced marginal efficiency of capital. According to Hazlitt, the government is not adequately equipped to handle massive investments.
8. **Speculation.** Hazlitt says intelligent speculation is necessary to reduce business fluctuations and promote economic growth. While Keynes was very severe on the role of speculators.
9. **Investment is guided by Industry Specific MEC.** Keynes constructed MEC for the entire economy. Economy wide MEC is not relevant to business decisions. It is the industry specific MEC which guides private investment.

- 10. Perfect Competition.** Keynes assumed the existence of perfect competition. However, in reality competition is imperfect.

4.9 QUESTIONS

1. Define investment and explain the types of investment.
2. Explain the determinants of investment.
3. Explain the difference between MEC and MEI.
4. Explain in detail the concept of MEC.
5. Explain the relationship between MEC, ROI and investment demand.
6. Explain how profit expectations influence the investment demand curve.
7. Explain the factors influencing MEC.
8. Explain the measures to stimulate private investment.
9. Explain the limitations of MEC.

MODULE 3

INFLATION AND TRADE CYCLES**Unit Structure:**

- 5.0 Objectives
- 5.1 Meaning of Inflation
- 5.2 Types of Inflation Based on Rates of Inflation
- 5.3 Demand Pull and Cost Push
- 5.4 Keynes Theory of Inflationary Gap
- 5.5 Inflation and GDP
- 5.6 The National Income Deflator
- 5.7 Questions

5.0 OBJECTIVES

- To study and understand the meaning of inflation
- To study various theories of inflation such as Demand pull and Cost push
- To study Keynesian theory of inflation
- To understand relationship between Inflation and GDP

5.1 MEANING OF INFLATION

A sustained rise in the general price level over a period of time is known as inflation. Conversely, a sustained fall in the general price level would be known as deflation. Inflation is measured in terms of a price index. For instance in India, we have the wholesale price index (WPI) and the consumer price index (CPI). The Price Index is based on a basket of goods and services. Within a given basket, the prices of some goods and services may rise or fall. However, when there is a net increase the price of the basket, it is called inflation.

Table 5.1
Inflation Rate based on Wholesale Price Index (WPI)
in India for the period 2004-05 to 2007-08

Year	Wholesale Price Index	Inflation Rate (%) $P = [(P_1 - P_0) / P_0] \times 100$
2003-04	180.3	-
2004-05	189.5	$189.5 - 180.3 / 180.3 \times 100 = 5.1\%$
2005-06	197.2	$197.2 - 189.5 / 189.5 \times 100 = 4.1\%$
2006-07	210.4	$210.4 - 197.2 / 197.2 \times 100 = 5.9\%$
2007-08	217.4	$217.4 - 210.4 / 210.4 \times 100 = 4.1\%$

Inflation is a rate of change in the price level. The rate of change is measured with reference to the base year so that a long term perspective is obtained with regard to price rise. For all practical purposes, inflation rate is measured on yearly basis. However, in recent years, the inflation rate is also measured on monthly and weekly basis. The rate of inflation can be measured as: $P = [(P_1 - P_0) / P_0] \times 100$. For example, the price index based on the Wholesale Prices in India for the year 2003-04 was 180.3 and in 2004-05, it was 189.5. The rate of inflation for the year 2004-05 was 5.1 per cent. Inflation rate measured on the basis of wholesale price index (WPI) for the period 2004-05 to 2007-08 in India is given in Table 5.1.

5.2 TYPES OF INFLATION BASED ON RATES OF INFLATION

On the basis of the rate of price rise, inflation is classified into five categories. They are **creeping or moderate inflation, walking, running, galloping and hyper inflation**. When the rate of price rise is less than three per cent per annum, it is called creeping inflation. An inflation rate of about three per cent per annum is considered creeping. When prices creep upwards at a moderate rate, inflation serves as an incentive to investment. As a result, the rate of investment, employment, output and aggregate demand rises in the economy and the economy moves into the prosperity phase.

When inflation rate crosses the three per cent mark and remains within single digits i.e. below the 10 per cent mark, it becomes walking inflation. Walking inflation leads to a much rapid fall in the purchasing power of money. However, the negative consequences of single digit inflation are not widely felt and hence it is considered within the tolerable limits. However, both monetary and fiscal policies are swung into action to control the rate of inflation and keep it within single digits.

When inflation rate is in double digits, it is known as running inflation. When prices begin to rise by more than 10 per cent per annum and the rate of inflation accelerates, money begins to flow away from productive activities into unproductive or speculative activities. As a result, the supply of goods and services fall in the economy and their prices begin to rise more rapidly. Thus, commodity prices rise rapidly for want of investment and prices of gold, real estate and stocks rise more rapidly because more and more money is diverted from the productive sector to the unproductive sector.

When prices rise by about 100 per cent annum, the situation is known as galloping inflation and when the inflation rate is over 1000 per cent a year, it is called hyper inflation. Both galloping and hyper inflation signals the collapse of the economy. Productive activity is at an all time low, people lose confidence in the currency and the economy looks like more of a barter economy. During World War one, countries like Austria, Hungary, Germany, Poland and Russia experienced hyper inflation. For instance, between 1920-23, the German price index rose from one to one billion. In

1994, the inflation rate in Georgia was 15000 per cent per annum. **In 2008, the inflation rate in Zimbabwe was 11.2 million per cent.** In such situations, the paper on which money is printed become more valuable than the money itself i.e. the intrinsic value of even paper money becomes greater than the face value. Thus, if you sell money by kilograms you may get more money in return than by exchanging money in the market for goods and services.

5.3 DEMAND PULL AND COST PUSH

Broadly speaking, there are three types of inflation which constitutes the causes of inflation. Demand side factors will cause demand pull inflation, supply side factors will cause cost push inflation and structural factors will cause structural inflation. Here in this section, we will analyze these three major types of inflation.

5.3.1 Demand -pull Inflation

Demand pull inflation takes place due to rise in aggregate demand. Aggregate demand may rise due to combined effect of higher demand from the various sectors of the economy such as the firms, households and the government. According to Keynes, inflation arises when there is an inflationary gap in the economy. Inflationary gap arises when aggregate demand is greater than aggregate supply at full employment level of output. Keynes explained inflation in terms of demand pull forces. When the economy is operating at the full employment level of output, supply cannot increase in response to increase in demand and hence prices rise.

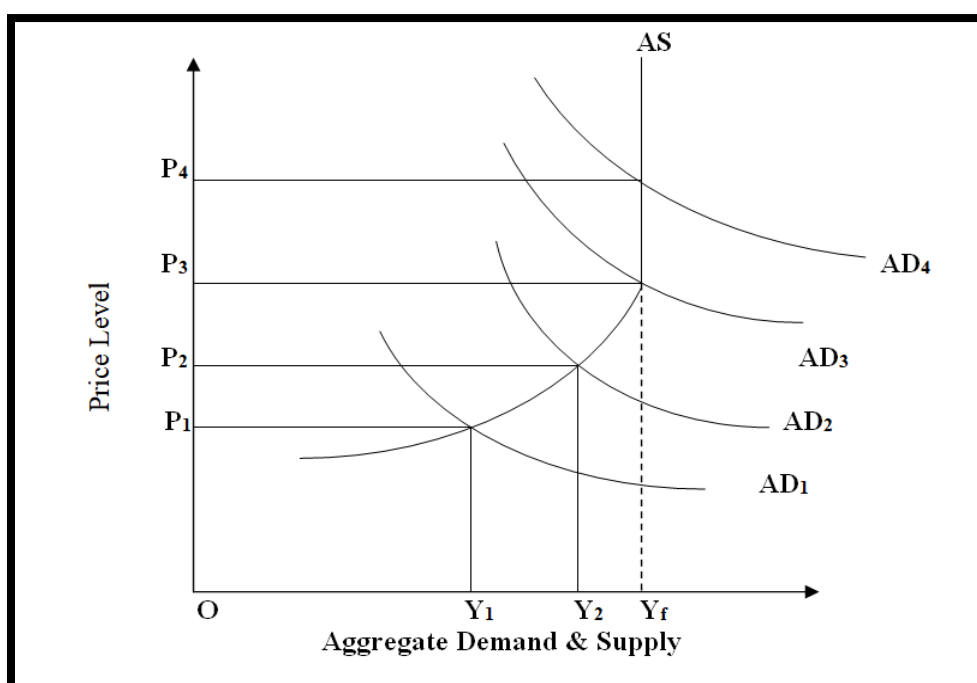


Fig. 5.1: Demand Pull Inflation

Demand pull inflation is depicted in Fig.5.1. You may note that aggregate demand and supply curves are measured along the X-axis and the general

price level is measured along the Y-axis. The aggregate supply curve AS rises upward in the beginning and becomes vertical when full employment level of output is achieved at point OY_f . This is because the supply of output cannot be increased once full employment level of output is achieved. When the aggregate demand curve is AD_1 , the equilibrium is less than full employment level and the price level OP_1 is determined. When aggregate demand increases to AD_2 , the price level rises to OP_2 due to excess demand at price level OP_1 . Since the economy is operating at less than full employment level, the real sector of the economy responds to rise in prices and hence the output increases to OY_2 . When the aggregate demand further rises to AD_3 , the price level rises to OP_3 followed by increase in output to OY_f . When the aggregate demand further rises to AD_4 , the aggregate supply does not respond to remain constant at OY_f and only the price level rises to OP_4 . After the full employment level of output the aggregate supply curve becomes perfectly inelastic and parallel to the Y-axis.

5.3.2 Cost-push Inflation

In the absence of rise in aggregate demand, prices may rise due to increase in cost in terms of higher wages, higher input costs and higher profits. These are known to be autonomous increases in costs. Inflation on account of rise in costs is known as Cost push inflation.

- a) **Wage-push Inflation.** Powerful trade unions may bargain for higher wages and also get it even when the cost of living has not changed or the general price level is constant and there is no change in the productivity of labor. When employers have no choice but to yield to the demands of the trade union, they may pass on the higher costs to the consumers by charging higher prices on the goods and services produced. Such a situation leads to Cost-push inflation. In case of Cost-push inflation, the aggregate demand curve shifts to the left leading to fall in output and rise in the price level. Cost push inflation is also known as stagflation. Cost-push inflation is depicted in Fig. 1.2.
- b) **Profit-push Inflation.** Firms operating under imperfect market conditions such as monopoly, monopolistic and oligopoly markets may hike their profit margins either autonomously or through collusion. When prices rise on account of hike in profit margins, it is called profit-push inflation. Profit push inflation may lead to cost push inflation if the products are used as inputs by other firms. When prices of capital goods, intermediate goods and raw materials are increased to increase the profit margin by firms operating under imperfect competition and when these goods are used as inputs by other firms, the cost of production of these firms go up, thereby leading to cost push inflation.
- c) **Input Cost Inflation.** Supply shocks leading to rise in input costs is an important cause of input-cost inflation. For instance, the oil price shocks of 1970s. The sharp rise in world oil prices during 1973-75 and in 1979-80 created supply shocks and cost-push inflation. Recent

increases in the prices of crude oil also caused the inflation rate to go up. For instance, the weekly inflation rate in India was 12.34% during the second week of September 2008 as a result of sharp increase in the international prices of crude oil to \$150 per barrel. The government of India took monetary and fiscal measures to bring down the prices. Fortunately, the crude oil prices also fell below the \$50 per barrel mark in January 2009 and the weekly inflation rate in India also fell down to 6.4 per cent from the high of 12.34 per cent in September 2008.

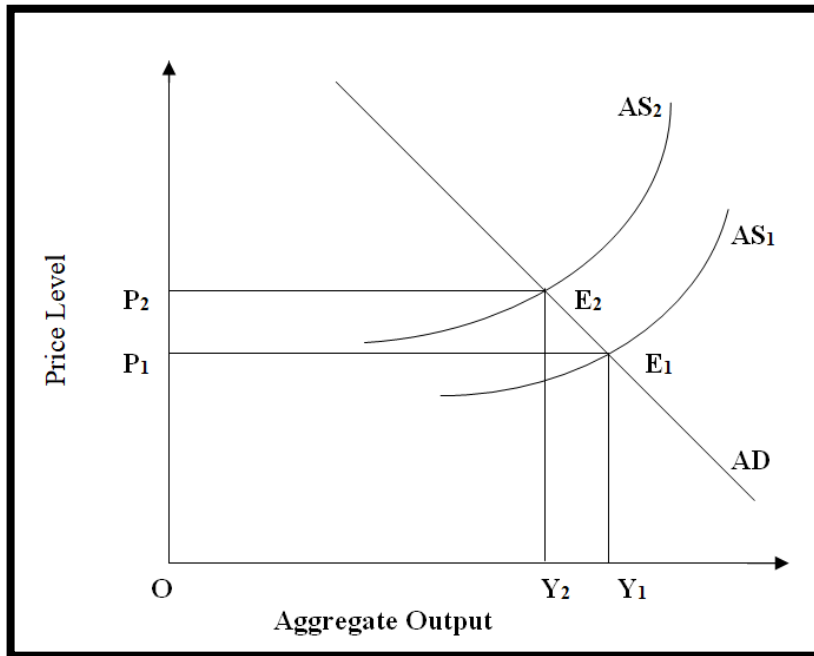


Fig. 5.2 Cost-push Inflation

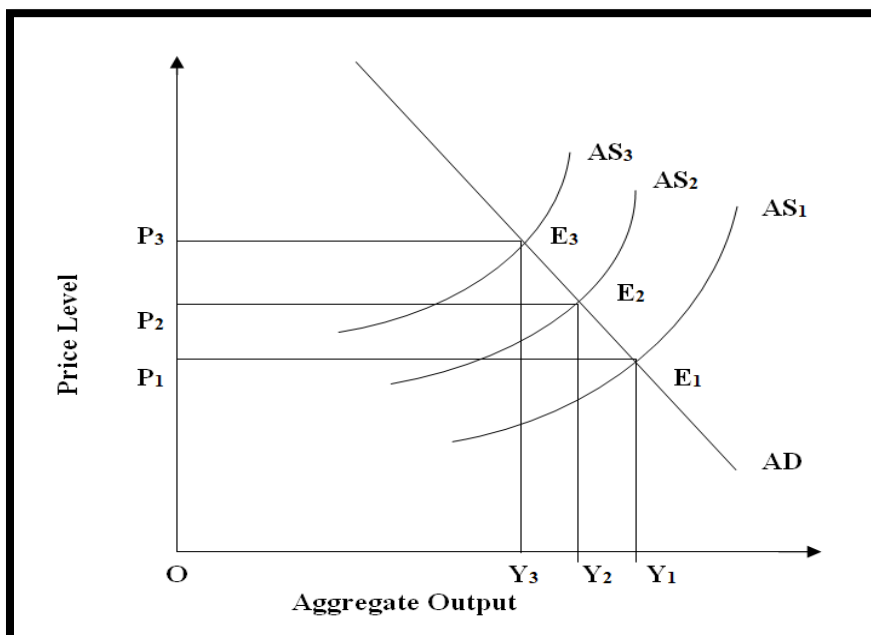


Fig. 5.3 Cost-push Inflation & Direct and Indirect Effects of Supply Shocks.

Cost push inflation as a result of rise in input prices is depicted in Fig. 5.3. Oil price shocks and rise in the price of other inputs have direct and indirect effects on the price level. When prices actually rise due to rise in input costs, the workers revise their price expectations upward. With upward price expectations, real wage rate declines and hence less labor is supplied at the given nominal wage rate. With the upward revision in the expected price level, the aggregate supply curve shifts to the left. This is known as the indirect effect of an expected upward price revision. In Fig.5.3, you will notice that the AS_1 curve shifts to the left to AS_2 and the price level rises to P_2 on account of oil price shock. This is known as the direct effect of a rise in the input cost. Now that the price level has gone up, the workers will revise the expected price level to P_2 . This pushes the AS curve further left to AS_3 and further rise in price level to P_3 . The movement from AS_2 to AS_3 is known as the indirect effect of oil price shock.

5.4 KEYNES THEORY OF INFLATIONARY GAP

Inflation or price rise is the result of a persistent excess aggregate demand over aggregate supply in the economy. The rise in aggregate demand beyond the capability of the economy during a given time to offer a matching aggregate supply would result in price rise. The capability of the economy is the productive capacity with the availability of the given productive resources. If the rise in aggregate demand is on account of a large budget deficit financed by borrowing from the Central Bank, there will be an increase in money supply and prices would rise. Thus, along with rise in aggregate demand, a rise in money supply would also cause the generation of inflationary forces. On account of excess aggregate demand, inflationary gap will be created which if not vacated or neutralized, prices will begin to rise. The fiscal policy instruments to control inflation are: (a) reduction in government expenditure and (b) increase in taxes. Reduction in government expenditure by way of reduction in the budget deficit and or by increasing the taxes, the level of aggregate demand can be brought down. The process of decrease in government expenditure and its impact on the level of aggregate demand is shown in Fig.5.4. The figure shows that the aggregate demand curve $C + I + G_1$ intersect the 45° line or the line of unity ($C = Y$) at point 'E₁' and determines equilibrium national income and output at point Y_1 which is the potential productive capacity of the economy during the given time period. Beyond this point if the aggregate demand rises on account of increase in government expenditure, financed by a budget deficit, the aggregate demand curve will intersect the line of unity at point E₂. The new aggregate demand curve $C + I + G_2$ will determine Y_2 level of income which is greater than the productive capacity of the economy determined at point Y_1 . Thus excess aggregate demand over aggregate supply by the amount E_1A shown in the figure generates an inflationary pressure causing the prices to rise. Such a price rise or inflation is also known as Demand-pull Inflation.

The inflationary gap can be vacated or neutralized by a decrease in the level of aggregate demand. The level of aggregate demand can be reduced by a contractionary fiscal policy using the fiscal policy instruments of reduced

government expenditure and increase in taxes. With equilibrium at point E_2 and money income being OY^2 , if the government reduces expenditure by E_2 which is equal to the inflationary gap E_1A , the aggregate demand curve $C + I + G_2$ will shift downward and once again the original equilibrium level of aggregate demand $C + I + G_1$ and Y_1 level of national income corresponding to the productive capacity of the economy will be established. You will notice that the fall in the nominal national income Y_2Y_1 is much greater than the fall in government expenditure E_2B . This is on account of the operation of reverse income or the investment multiplier.

Alternatively, the government can also bring about an increase in the direct taxes and reduce the disposable income of the community to bring down the level of aggregate demand and prices to their desired level. In the event that the government has a balanced budget and the economy experiences inflationary tendencies, it would mean that there are supply bottlenecks creating a shortfall in supply relative to demand. In such a situation, an anti-inflationary or tight fiscal policy by way of reduction in government expenditure will create a budget surplus. The government can vacate the budget surplus either by reducing or by impounding public debt. However, if the budget surplus is vacated by reducing public debt, the money supply will increase and thus dampen the anti-inflationary impact of a tight fiscal policy. The best way to realize the full impact of a tight fiscal policy in the event of a budget surplus is to keep the surplus idle so that money supply does not increase and dampen the deflationary impact of an anti-inflationary fiscal policy.

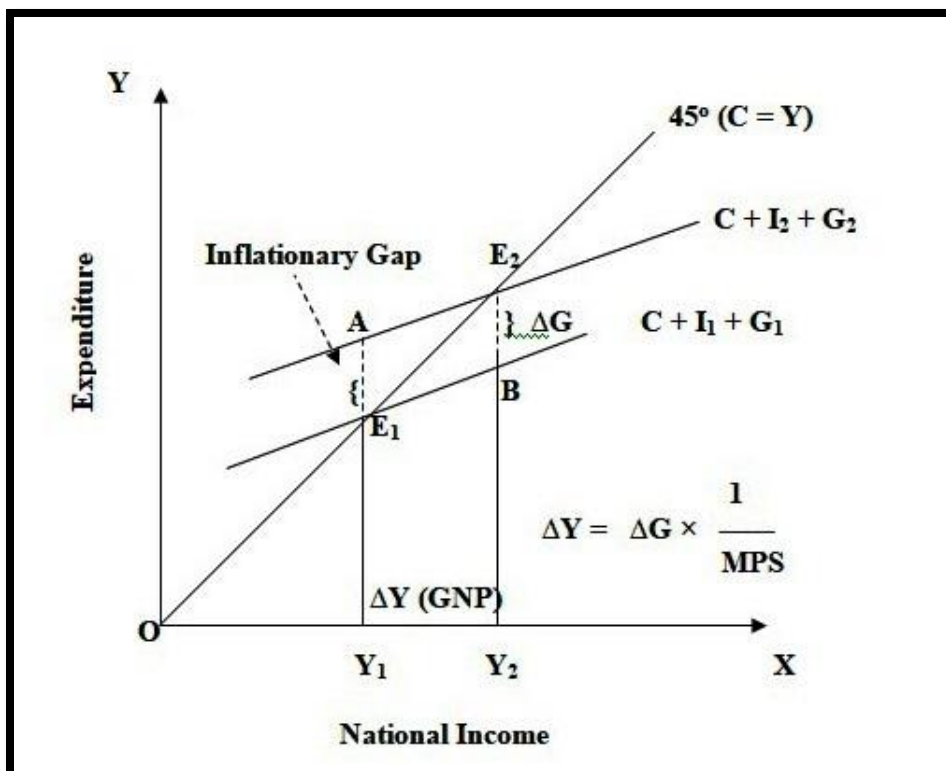


Fig. 5.4 – Inflationary Gap.

5.5 INFLATION AND GDP

When goods and services produced in a given year are multiplied with their current market prices, we get national income at current prices. However, prices do not remain constant. The value of national income at current prices changes according to the changes in the price level caused by inflation. When we measure, national income at current prices, what we get is the nominal national income. Thus, during a period of price rise or inflation, the nominal national income would rise even when the physical quantity of output produced remains constant. In order to find out the real rise in national income, the physical quantity of output should be multiplied with constant prices or base year prices. This process is called deflating the national income figures for the change in prices that have taken place during a period. Thus, through adjustment or deflation, the national income is calculated at constant prices. The national income at current prices is deflated by price index numbers to obtain national income at constant prices. To find out the real national income, the following formula is used:

$$\text{National Income at Constant Prices} = \frac{\text{National Income at Current Prices}}{\text{Price Index Number}} \times 100$$

For instance, the estimates of India's national income (NNP) for various years at current and constant prices are given in Table 5.2. The table shows that the increase in Net National Income at current prices is much greater than the increase in Net National Income at constant prices. The nominal values of NNP are much greater than that of the real values because the prices have increased during the period 2003-04 to 2007-08.

Table 5.2
Estimating National Income at Constant Prices from
National Income at Current Prices

Year	NI at Current Prices Rupees Trillion	Wholesale Price Index No. (Base 1999-2000)	NI at Constant Prices (1999-2000) Rupees Trillion
1	2	3	4 = (2/3 x 100)
2003-04	25.20	114.3	22.05
2004-05	28.55	120.6	23.67
2005-06	32.50	125.3	25.93
2006-07	37.60 ^Q	132.2	28.45 ^Q
2007-08	42.63 ^A	137.4	31.02 ^A

^QQuick Estimates, ^AAdvance Estimates. Source: Collated from IES 2007-08, Table 5.1.

Measuring national income at constant prices or measuring the real national income gives us the idea of the extent of thin air which is filled in the national income balloon. For instance, in the year 2003-04, the nominal national income is Rs.25.20 Trillion while the real national income is only

Rs.22.05 Trillion. The difference between the real national income and the inflated national income is Rs.3.15 Trillion which is the value of thin air. This thin air does not add anything to the purchasing power of the people who receive this money. Inflation is defined as a sustained rise in the price level of a country. For instance, in India, inflation has been a sustained phenomenon over the many decades of her existence in the post independence period. As a result, the gap between the real and the nominal or the less real increases overtime. Notice that in the year 2007-08, the gap between the real national income in Column 04 is much greater than the nominal national income in Column 01.

A moderate rise in the price level is considered salubrious to the economy because it provides the necessary incentive to the class of entrepreneurs to invest their surpluses to produce more goods and services and thereby increase the level of employment, income and output in the economy. An inflation rate between zero and three per cent is considered moderate by the economists. The Federal Reserve Bank of the United States have always targeted inflation rate at 2% and below per annum while inflation rate targeting in India by the Reserve Bank of India in recent years has been at 4 to 5 per cent per annum and historically speaking the RBI had been wont to stomach high rates of inflation.

Inflation is an unjust tax on the buyers or the class of consumers in the economy. It is also an unjust tax on the income tax payers in the economy. The class of producers or sellers and the government are always the beneficiaries of inflation. The government is able to generate more tax revenue and the producers or the sellers are able to make more profits. Inflation is therefore not only tolerated but also considered as an incentive to the class of entrepreneurs provided it remains in the narrow range of zero and three per cent which is also called *creeping inflation* in the literature of macro economics.

Higher the rate of inflation, higher will be the size of nominal GDP or the GDP balloon. For instance, the Indian nominal GDP in the year 2023 was Rs.306 Trillion whereas in US Dollar terms it was a mere USD 3.732 Trillion. The real comparison would be in purchasing power parity terms and in terms of PPP USD it was 13.119 Trillion. The PPP USD and INR exchange rate translates into One USD = INR 24 which means the Indian Rupee has inflated by 24 times the USD overtime. In addition to the rate of inflation in the two countries, there are a number of other factors which determine the market exchange rate and hence the difference between the two. Moderate or low inflation may provide the necessary incentive to the class of producers but walking and running inflation imposes heavy costs on the national economy in the long run.

5.6 THE NATIONAL INCOME DEFLATOR

When we divide nominal national income by real national income, we obtain the national income deflator. The real national income can be calculated by dividing nominal national income by the national income deflator. The national income deflator for various years given is given in Table 5.3.

You may notice from Table 5.3 that when we divide the nominal national income by the real income, we can obtain national income deflator. However, to find out the real national income one needs the price index of the relevant years. Once we have the current year price index number, we can find out the national income of the current year by dividing the nominal national income of the current year by the current year price index and multiply the quotient by hundred. Alternatively, the national income deflator can be found by dividing the current year price index by the base year price index. Since the base year price index is always hundred, the national income deflator can be simply found by moving the decimal points by two digits to the left. For instance, the wholesale price index in the year 2003-04 divided by 100 would give the national income deflator as 1.143. You may notice that we have simply shifted the decimal point by two digits to the left. Now when we divide the nominal national income or the national income at current prices by the national income deflator, we can obtain the real national income. For example, Rs.25.20 Trillion divided by 1.143 will give us Rs.22.05 Trillion which is the real national income for the year 2003-04.

Table 5.3 - Calculating the National Income Deflator

Year	NI at Current Prices Rupees Trillion	NI at Constant Prices (1999-2000) Rupees Trillion	The NI Deflator
1	2	3	4 = (2/3)
2003-04	25.20	22.05	1.143
2004-05	28.55	23.67	1.206
2005-06	32.50	25.93	1.253
2006-07	37.60 ^Q	28.45 ^Q	1.322
2007-08	42.63 ^A	31.02 ^A	1.374

5.7 QUESTIONS

1. Explain the concept of inflation and state with example as to how the inflation rate is measured?
2. Explain the concept of Demand pull inflation and the factors causing demand pull inflation.
3. Explain the concept of Cost push inflation and the factors causing Cost push inflation.
4. Explain the concept of inflationary gap.
5. Explain the relationship between inflation and GDP.

TRADE CYCLES

Unit Structure:

- 6.0 Objectives
- 6.1 Introduction
- 6.2 Phases of Trade Cycles
- 6.3 Anti-cyclical policy
- 6.4 Theories of Trade Cycles
- 6.5 Questions

6.0 OBJECTIVES

- To study and understand the meaning of trade cycles
- To study Anti-cyclical policy or Counter cyclical measures
- To study various theories of trade cycles such as Hicks, Schumpeter, Goodwin and Samuelson

6.1 INTRODUCTION: TRADE CYCLES

The economic history of the world, particularly the capitalist countries, is full of instances of business or economic fluctuations. Almost all the capitalist countries have experienced business fluctuation at different stages of their economic history. The economy may go through business upswings and downswings, booms and busts, prosperity and recession and may even go through depression.

At times business conditions are prosperous when a large number of jobs are created, factories are found to be working in multiple shifts, prices are rising and companies are making healthy profits. At times, goods remain unsold for want of adequate demand, workers are laid off and profits are low. Such a situation is known as a recession which is sometimes short and mild. For instance, the Indian economy experienced a growth rate of only 1.1 per cent in its GNP in 1991-92 as against 5.5 per cent in 1990-91. However, between 1992-93 and 1996-97, the GNP grew at an increasing rate with a peak growth rate of 8.2 per cent in 1996-97. The year 1997-98 again experienced a down turn with a growth rate of 4.8 per cent with recovery in 1998-99 and 1999-2000 with growth rates of 6.5 per cent each. Thus looking at the nineties, the year 1991-92 can be characterized as recessionary. The period between 1993-94 and 1996-97 can be termed as prosperous with an intermittent fall or slump in the year 1997-98. The years 1998-99 and 1999-2000 can be regarded as the year of recovery or steady growth. Thus even within a short span of a decade, economies may experience upswings and downswings as in the case of Indian economy. The annual average growth rate in India's national income during the 10th Five Year Plan was 7.8 per cent. The 10th Five Year Plan period (2002-07)

saw a sustained increase in the rate of growth of economy from four per cent in 2002-03, 8.6 per cent in 2003-04, 7.3 per cent in 2004-05, 9.6 per cent in 2005-06 and 9.7 per cent in 2006-07. The 11th Five Year Plan (2007-12) began with a growth rate of nine per cent in 2007-8 and the projected growth rates for years 2008-09 and 2009-10 are 6.6 and 5.7 per cent respectively. The slowing down in the growth performance of the Indian economy and the lower projected growth rates has been a consequence of the global recession that began in the year 2007-08.

There can be persistent recession culminating in a depression as was the case of the great economic depression of the 1930s which engulfed Western Europe and the United States. These fluctuations or upturns and downturns are known as business cycles.

Business fluctuations are inherent in a capitalist economy and therefore they are recurring in nature. They influence business decisions and set the course of business in the future. The period of prosperity is characterized by new opportunities for investment, employment and production and business is seen to be smiling. In contrast, during the period of recession, on account of falling aggregate demand, there are fewer opportunities of investment and hence growth rates of employment and output experience a continuous fall. Entrepreneurs and business managers must therefore analyze the business conditions and take appropriate decisions in order to maximize profits under the given circumstances.

Business cycles are also known as trade cycles. **According to John Maynard Keynes, “A trade cycle is composed of periods of good trade characterized by rising prices and low unemployment percentages with periods of bad trade characterized by falling prices and high unemployment percentages.”** Writing about the harmful consequences of business cycles, G Crowther, in his work ‘An Outline of Money (London 1952) says, **“On the one hand, there is the misery and shame of unemployment with all the individual poverty and social disturbances that it may create. On the other hand, there is the loss of wealth represented by so much wasted and idle labor and capital.”** Writing his work, ‘Business Cycle: The Problem and its Setting (New York, National Bureau of Economic Research, 1957, WC Mitchell says “Business cycles are a type of fluctuation found in the aggregate economic activity of nations that organize their work mainly in business enterprises. A cycle consists of expansions occurring at about the same in many economic activities followed by similarly general recessions, contractions and revivals which merge with the expansion phase of the next cycle. This sequence of change is recurrent but not periodic.” These definitions of business cycles make it abundantly clear that the phenomenon of high growth and low growth is a recurring feature of a capitalist economy.

A business cycle is a swing in total national product, income and employment generally lasting for a period of two to ten years. It is characterized by economy-wide expansion or contraction. Business cycles are divided into two main phases. These are: contraction and expansion. Peaks and troughs indicate the turning points of the business cycles. The

downturn of a business cycle is called a recession or contraction. It is defined as a period in which real national income falls for at least two successive quarters. The recession begins at a peak and ends in the trough. The pattern of business cycle is irregular and different. Business cycles are an integral part of capitalist economy. They are recurring in nature. They influence business decision making and determine the course of future business. During the period of expansion, new investments are made leading to higher output and employment and higher economic growth. During the recession, new investments are not made and as a result, the rate of growth of employment and output falls leading to lower economic growth rate.

6.1.1 Features of a Business Cycle

The **characteristic features** of an **expansionary** business cycle are as follows:

1. There is a sharp rise in demand for consumer durables. Inventories of durable goods are low because supplies do not match rising demand leading to rise in prices. Firms react by increasing production and real national product rises. Investment in plant and equipment also rises.
2. The demand for labor raises leading to higher wage rates and higher level of employment.
3. With rising production, the demand for raw materials rises and prices begin to rise.
4. The profits of firms rise sharply leading to rise in stock prices. Investor demand for stocks also rises.
5. Interest rates raises due to continued rise in demand for bank credit.

6.1.2 The characteristic features of recession are as follows:

1. The demand for consumer durables falls. Inventories of durable goods are high because demand does not match rising supply leading to fall in prices. Firms react by decreasing production and rate of growth of real national product falls. Investment in plant and equipment also falls.
2. The demand for labor falls leading to falling wage rates and employment.
3. With falling production, the demand for raw materials falls and prices begin to fall.
4. The profits of firms fall sharply resulting in fall in stock prices. Investor demand for stocks also falls.
5. Interest rate falls due to continued fall in demand for bank credit.

Recession is the opposite of expansion and hence the characteristic features of recession are opposite to that of expansion.

6.2 PHASES OF TRADE CYCLES

There are only two phases in a business cycle, namely: expansion or prosperity and recession or the down turn. However, these phases do not emerge all of a sudden. There is a gradual building up and slippages into these phases. Accordingly, the phases of business cycles can be stated as follows:

1. Expansion.
2. Peak.
3. Recession.
4. Trough, and
5. Recovery.

These five phases are shown in Fig. 6.1. The upward sloping growth line shows the steady growth of the economy. The cyclical line shows the different phases of business cycle which moves above and below the steady growth line. The expansionary phase of the business cycle or the economic uptrend is depicted by the upward sloping segment of the cyclical line lying above the steady growth line. During this phase of expansion or prosperity, aggregate investment, employment, output, income and demand increases leading to increase in sales, profits, investment demand the general price level. After a point, the rate of growth of the economy slows down and reaches the peak which denotes the end of the expansionary phase of the business cycle.

The recessionary phase of the business cycle begins when the cyclical line assumes a negative slope. During this phase, there is a sharp decline in aggregate investment, employment, output, incomes, demand and prices on account of a steady fall in the rate of growth of the economy. However, the rate of growth of the economy continues to remain above the steady growth rate. It is only when the cyclical line spins downwards and below the steady growth line, the economy slumps into the depressionary phase. It is during this phase that the rate of growth becomes negative which means that the economy experiences an absolute fall in aggregate investment, employment, output, incomes, demand and prices. The economic decline continues until it reaches the trough or the abyss of the cyclical line wherefrom the phase of recovery again begins.

During the period of recovery, the economy experiences rapid growth in aggregate investment, employment, output, income and demand. However, the economy continues to remain below the path of the steady growth line. It is only when the cyclical line crosses the steady growth line from below that the economy enters the phase of expansion and prosperity once again.

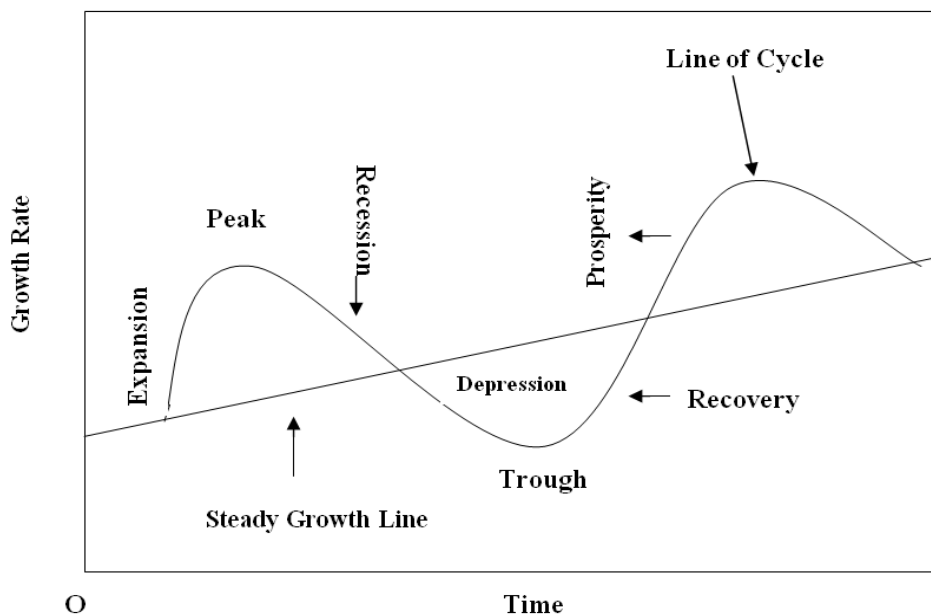


Fig. 6.1: Phases of Business Cycle

A more detailed explanation of the phases of business cycle is given below.

1. **Expansion or the Prosperity Phase:** The expansionary phase of the business cycle is shown by the upward sloping segment of the cyclical line positioned above the steady growth line. During expansion, total investment, employment, output, income and demand increases leading to increase in sales, profits, investment demand and the general price level. Inventory level rises and interest rates rises due to rising investment demand. Due to rising price levels, the real interest rates are low. The profitability of firms is high leading to higher dividend declarations. As a result, the stock prices rises. Thus during expansion, the real national income steadily rises.
2. **The Peak of Boom:** After a point, on the cyclical curve, you will notice that the rate of growth of the economy falls and the curve reaches its peak. The peak point indicates the end of expansion. The economy reaches near full employment level. The supply of inputs is reduced and demand continues to remain high leading to rising input prices. Due to shortage of skilled labor, the wage rates increases. Rising wage rates contribute to cost push inflation. Prices begin to rise more rapidly than the rise in employment and output. Wage rates begin to rise less rapidly than the rise in cost of living. Thus total demand in the economy begins to fall and the economy reaches the next phase of business cycle i.e., recession.
3. **Recession or the Downturn:** During recession, total supply in the economy is greater than total demand. This leads to fall in the general level of prices. The supply is greater than demand because it is not possible for the firms to reduce employment and output according to the rapidly falling demand. In the later stages of recession, firms begin to withdraw investment and lay-off temporary workers. Input

orders are cancelled and as a result, investment, output and employment in the input industry also begin to fall. The general price level and profitability also begin to fall. Consumers postpone their demand expecting lower prices in the future. Supply continues to be greater than demand and prices continue to fall. The economy begins to contract and falls into depression.

4. **Trough or the bottom of Depression:** During depression, the rate of growth of economy becomes negative and the national income begins to fall. Unemployment levels rises rapidly due to falling aggregate investment. The general price level falls rapidly. Interest rates are very low; however, demand for credit is also very low. Numerous firms make losses and stock prices begin to fall rapidly. At the lowest end of the cyclical curve, the period of depression comes to an end.
5. **Recovery and Expansion:** Economic recovery begins after depression comes to an end. Since unemployment levels are very high, wage rates are very low. Expectations of the firms improve and they begin to make fresh investment. Growing investment, employment, output, income and demand indicates the beginning of economic recovery. Growing optimism pushes the economy into the stage of expansion and prosperity. Prices begin to rise once again. Rising prices leads to more profitability and growing profitability leads to growing investment, employment, output, income and demand in the economy.

These phases of business cycle keep repeating during long periods of time in a capitalist economy.

6.3 ANTI-CYCLICAL POLICY

Both Monetary and Fiscal policies are an effective instrument to control business fluctuations, both recession and inflation. There are two types of fiscal policy, namely: (1) discretionary fiscal policy and, (2) non-discretionary fiscal policy of automatic stabilizers. Discretionary fiscal policy refers to a deliberate and purposeful change in the government expenditure and taxes to influence the level of national income and prices by influencing the level of aggregate demand for goods and services. Non-discretionary fiscal policy of automatic stabilizers refers to a built-in tax and expenditure mechanism that increases aggregate demand when there is a recession and reduces aggregate demand when there is inflation. Similarly, there are two types of monetary policies. They are expansionary monetary policy and contractionary monetary policy. While the fiscal policy is implemented by the government, the monetary policy is implemented by the Central Bank of a country. During the expansionary phase of the business cycle, a contractionary monetary policy is applied and during the period of recession, an expansionary monetary policy is implemented.

6.3.1 Discretionary Fiscal Policy as a Counter-cyclical Measure

Discretionary fiscal policy is of two types, namely: (1) Anti-recessionary fiscal policy and, (2) Anti-inflationary fiscal policy. Anti-recessionary fiscal policy is also known as expansionary fiscal policy which is used to draw the economy out of recession. Similarly, anti-inflationary fiscal policy is known as contractionary fiscal policy which is intended to control inflationary tendencies in the economy. An anti-inflationary fiscal policy calls for reduction in government expenditure and raising of taxes whereas an anti-recessionary fiscal policy calls for increase in government expenditure and reduction in taxes. In effect, the aim of fiscal policy is to influence the level of aggregate demand and prices in the economy so that the twin goals of macroeconomic management, namely: economic growth and price stability are achieved. Fiscal policy is therefore a policy of demand management. An expansionary or anti-recessionary fiscal policy would result in a deficit budget because the government expenditure will have to be more than its income or there may be a fall in government income on account of reduction in taxes. A budget deficit may be caused either by increase in expenditure through borrowing or by reduction in taxes and therefore tax revenue or a combination of both these factors. The opposite will be the case of a contractionary or anti-inflationary fiscal policy whereby government expenditure will be reduced and taxes raised. As a result of the reduction in government expenditure, the budget deficit may be relatively reduced or there may be a budget surplus.

1. Anti-recessionary or Expansionary Fiscal Policy

A fall in aggregate demand due to a fall in private investment is the cause of recession. A fall in private investment takes place because of the poor expectations of businessmen on the profitability of investments. The fall in aggregate demand creates deflationary gap in the economy which has to be filled by compensatory government expenditure or by reducing taxes. Thus, we have two methods to draw the economy out of recession, namely: (a) compensating increase in government expenditure and, (b) reduction in taxes.

- (a) Compensating Increase in Government Expenditure:** In order to draw the economy out of recession, the government through the technique of compensatory public spending may embark on a massive public works program constituting social and economic infrastructure. The construction of social and economic infrastructure consisting of roads, national highways, dams, canals, irrigation projects, electricity generation, schools, hospitals etc would generate demand for capital goods and labor. This in turn, creates employment not only in the capital goods industries but also in the public works program. Additional employment will generate additional demand for consumption goods. Thus increase in government expenditure generates demand both for capital and consumption goods. The incomes generated on account of increase in government expenditure will propagate itself through the income or the investment multiplier. The income or the investment multiplier in turn depends upon the

marginal propensity to consume or the marginal propensity to save. The co-efficient of the investment multiplier is given by the formula:

$$k = \frac{1}{1 - MPC}$$

Where 'k' stands for the multiplier co-efficient and MPC refers to the marginal propensity to consume.

As $1 - MPC = MPS$, the multiplier formula can be restated as :

$$k = \frac{1}{MPS}$$

Assuming a marginal propensity to save of 20% or a marginal propensity to consume of 80%, an additional government expenditure of Rs. One Trillion will generate an income stream of Rs.5 Trillion through the income multiplier process. Substituting the numerical values mentioned above in the formula, the change in national income (ΔY) due to a change in investment (ΔI) can be measured as follows:

$$\Delta Y = \Delta I \cdot k$$

$$\text{Where } k = \frac{1}{MPS}$$

$$\text{Or } k = \frac{1}{1 - 0.8}$$

$$\text{i.e., } k = \frac{1}{0.2}$$

$$k = 5$$

Therefore the value of multiplier 'k' is five. Thus $\Delta Y = \text{Rs.1T} \times 5 = \text{Rs.5 Trillion}$. The size of additional government expenditure required to fill the deflationary gap will be determined by the investment multiplier 'k' and the investment multiplier in turn will be determined by the marginal propensity to save. The effect of increase in government expenditure on national income and employment can be illustrated with the help of Fig.6.2 given below.

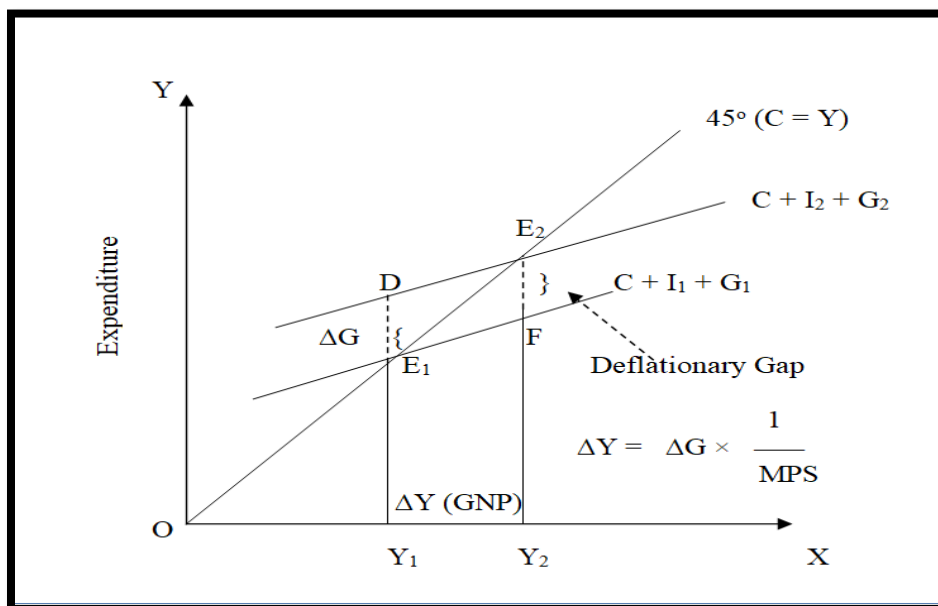


Fig. 6.2 - Compensatory Increase in Government Expenditure as an Example of Anti-recessionary Fiscal Policy

Let us assume that the economy is operating at Y_2 level of output and the aggregate demand curve $C + I_2 + G_2$ is intersecting the 45° line at point E_2 . Due to poor investment prospects, the aggregate private investment falls leading to a fall in the aggregate demand. As a result, the aggregate demand curve shifts downwards and to a lower level i.e. $(C + I_1 + G_1)$ and the economy shrinks to a lower equilibrium position E_1 with Y_1 level of national income. The fall in national income and output will lead to open or involuntary unemployment and idle or excess production capacity in the economy. The fall in investment E_2F creates a deflationary gap and the national income shrinks by Y_2Y_1 via the reverse multiplier, thus creating recessionary conditions in the economy. To draw the economy out of recession, the government increases its expenditure (ΔG) by E_1D , shifting the aggregate demand curve to its original position $C + I_2 + G_2$ and national income to Y_2 . The increase in national income Y_1Y_2 is equal to:

$$\Delta G \times \frac{1}{\text{MPS}} \quad \text{where} \quad \frac{1}{\text{MPS}} \quad \text{is the multiplier co-efficient.}$$

The Role of Monetary Policy: However, the anti-recessionary effort of the government will fully succeed only if the rate of interest does not rise. Due to increased government expenditure, income and employment will rise leading to a rightward shift in the demand for money. If the money supply remains constant, a rise in demand for money will lead to higher interest rates and fall in private investment demand. The fall in private investment demand will reduce the expansionary effect of increased government expenditure. Thus, along with an expansionary fiscal policy, money's supply will have to be supplemented by an **expansionary monetary policy** to keep the

interest rates constant. It only means that fiscal policy alone will not be good enough to draw the economy out of recession. The effect of increase in government expenditure on the transaction demand for money and the rate of interest and the importance of an expansionary monetary policy to supplement the governmental effort are shown in Fig.6.3 below.

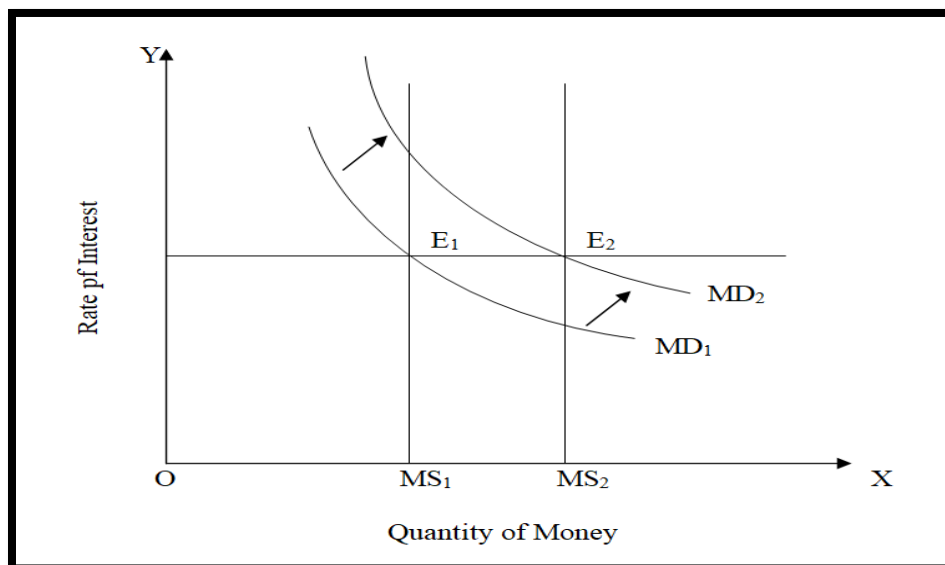


Fig.6.3 - Expansionary monetary Policy to prevent the interest rate from rising as a result of expansionary Fiscal Policy.

It can be seen from Fig.1.3 that the Money Demand Curve shifts towards the right as a result of rise in income and employment. Given the money supply curve MS_1 and the new demand curve MD_2 , the rate of interest will rise. However, to keep the interest rate constant, the Central Bank must increase money supply by $MS_1 - MS_2$. As a result of increased money supply, the money demand curve MD_2 intersects the money supply curve MS_2 at point E_2 and the rate of interest remains the same. Thus an expansionary monetary policy supplements anti-recessionary fiscal policy and help realize the desired impact on income and employment.

- (b) **Tax Reduction as an Instrument of Anti-recessionary Fiscal Policy:** Expansion in income and employment can be realized in a recessionary situation by reducing the tax levels. Obviously, a reduction in taxes will increase the disposable income of the people and lead to an increase in the aggregate demand. The possible expansion in aggregate demand as a result of tax reduction depends upon two objective factors, namely: the value of tax reduction and the marginal propensity to consume. For instance, if the net result of changes in the tax structure is a loss of revenue to the government of the order of Rs. One Trillion and assuming the MPC to be 80% or that the value of MPLC being 0.8, consumption demand in the economy will rise by Rs.80, 000 Crores with Rs.20, 000 Crores as the savings made by the community. The increase in consumption demand will

have a multiplier effect through the tax multiplier given by the formula:

$$\Delta T \times \frac{MPC}{1 - MPC}$$

Or

$$\Delta C \times \frac{1}{1 - MPC}$$

$$\text{i.e., } 1T \times \frac{0.8}{1 - 0.8} = \text{Rs.1 Trillion} \times 4 = \text{Rs.4 Trillion.}$$

Or

$$\text{Rs.80,000 Crores} \times \frac{1}{1 - 0.8} = \text{Rs.80,000 Crores} \times 5 = \text{Rs.4 Trillion.}$$

Thus reduction in taxes will lead to increase in consumption demand until the tax multiplier process exhausts itself and in the process will also lead to increase in income and employment. However, you will notice that the expansionary effect of a policy of tax reduction is less than that of a policy of budget deficit. In our earlier example, the value of investment multiplier was 5 with MPC being 0.8, whereas the tax multiplier is only 4 with the same MPC.

Conclusion

It is obvious from the foregoing discussion that a policy of tax reduction has a relatively less expansionary effect on income and employment than that of a policy of increase in government expenditure. Further, to obtain an identical effect on income and employment by a policy of tax reduction, the budget deficit will have to be proportionately higher than in the case of increase in government expenditure. For instance, to bring about an identical expansion in income and employment by way of tax reduction, the community's disposable income will have to be increased by Rs.1.25 Trillion (Rs.1.25 T $\times$ 4 = Rs.5 T). The budget deficit thus will be larger in case of adopting a policy of tax reduction. However, the choice between the two is not all that easy. It depends upon the relative efficiencies of the two multipliers. If it is viewed that public works programs are relatively less efficient and that there will be leakage in the government initiated programs, the value of the investment multiplier will be reduced by the extent of leakages and the delays in the execution of public works. In that case, a policy of tax reduction

will be advisable. However, real life economics is part politics and part economics and hence the choice between the two will depend upon politico-economic expediency. If political expediency assumes primacy over economic expediency, government spending will be increased because the direct beneficiaries of increased government expenditure are the poor and the unemployed whereas the direct beneficiaries of tax reduction are the classes above the middle which of course in a developing country is relatively smaller in size.

2. Anti-inflationary or Contractionary Fiscal Policy.

Inflation or price rise is the result of a persistent excess aggregate demand over aggregate supply in the economy. The rise in aggregate demand beyond the capability of the economy during a given time to offer a matching aggregate supply would result in price rise. The capability of the economy is the productive capacity with the availability of the given productive resources. If the rise in aggregate demand is on account of a large budget deficit financed by borrowing from the Central Bank, there will be an increase in money supply and prices would rise. Thus, along with rise in aggregate demand, a rise in money supply would also cause the generation of inflationary forces. On account of excess aggregate demand, inflationary gap will be created which if not vacated or neutralized, prices will begin to rise. The fiscal policy instruments to control inflation are: (a) reduction in government expenditure and (b) increase in taxes. Reduction in government expenditure by way of reduction in the budget deficit and or by increasing the taxes, the level of aggregate demand can be brought down. The process of decrease in government expenditure and its impact on the level of aggregate demand is shown in Fig.1.4. The figure shows that the aggregate demand curve $C + I + G_1$ intersects the 45° line or the line of unity ($C = Y$) at point 'E₁' and determines equilibrium national income and output at point Y₁ which is the potential productive capacity of the economy during the given time period. Beyond this point if the aggregate demand rises on account of increase in government expenditure, financed by a budget deficit, the aggregate demand curve will intersect the line of unity at point E₂. The new aggregate demand curve $C + I + G_2$ will determine Y₂ level of income which is greater than the productive capacity of the economy determined at point Y₁. Thus excess aggregate demand over aggregate supply by the amount E₁A shown in the figure generates an inflationary pressure causing the prices to rise. Such a price rise or inflation is also known as Demand-pull Inflation.

The inflationary gap can be vacated or neutralized by a decrease in the level of aggregate demand. The level of aggregate demand can be reduced by a contractionary fiscal policy using the fiscal policy instruments of reduced government expenditure and increase in taxes. With equilibrium at point E₂ and money income being OY₂, if the government reduces expenditure by E₂ which is equal to the inflationary gap E₁A, the aggregate demand curve $C + I + G_2$ will shift downward and once again the original equilibrium level of aggregate demand $C + I + G_1$ and Y₁ level of national income corresponding to the productive capacity of the economy will be established. You will notice that the fall in the nominal national income

Y_2Y_1 is much greater than the fall in government expenditure E_2B . This is on account of the operation of reverse income or the investment multiplier.

Alternatively, the government can also bring about an increase in the direct taxes and reduce the disposable income of the community to bring down the level of aggregate demand and prices to their desired level. In the event that the government has a balanced budget and the economy experiences inflationary tendencies, it would mean that there are supply bottlenecks creating a shortfall in supply relative to demand. In such a situation, an anti-inflationary or contractionary fiscal policy by way of reduction in government expenditure will create a budget surplus. The government can vacate the budget surplus either by reducing or by impounding public debt. However, if the budget surplus is vacated by reducing public debt, the money supply will increase and thus dampen the anti-inflationary impact of a contractionary fiscal policy. The best way to realize the full impact of a contractionary fiscal policy in the event of a budget surplus is to keep the surplus idle so that money supply does not increase and dampen the deflationary impact of an anti-inflationary fiscal policy.

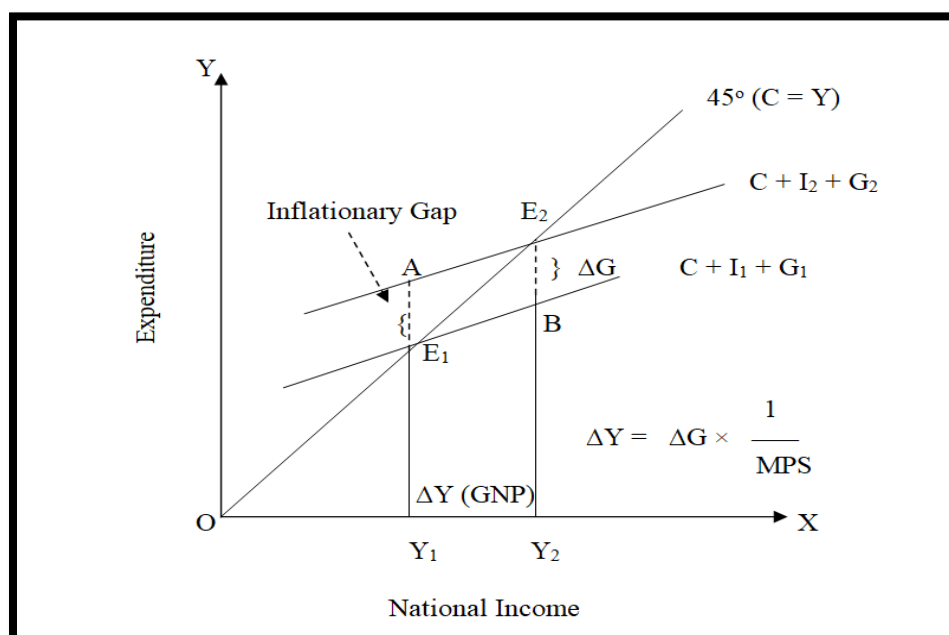


Fig. 6.4 – Anti-inflationary Impact of a Contractionary Fiscal Policy (Reduction in Government Expenditure)

6.3.2 Contra-cyclical Non-discretionary Fiscal Policy (Automatic Stabilizers)

The non-discretionary fiscal policy of automatic stabilizers is a built-in tax and expenditure mechanism that increases aggregate demand when there is recession and reduces aggregate demand in the event of inflation in the economy. Thus the tax structure and the expenditure pattern vary automatically with the changes in national income and help to maintain economic stability. The fiscal measures of non-discretionary fiscal policy are hence called built-in or automatic stabilizers.

The automatic fiscal stabilizing instruments are personal income tax, corporate income tax, transfer payments and corporate dividends.

1. **Personal Income Tax and Corporate Income Tax:** The personal income tax is structured in such a manner that a direct relationship is established between tax revenue and the level of income. Further, personal income tax is progressive in nature i.e. people in the higher income brackets pay higher rates of tax. For instance, personal income tax ranges between 10% minimum and 30% maximum in India. Individuals with income above Rs.1.5 lakh but less than Rs.2.5 lakhs, the income tax rate is 10%. Between Rs.2.5 lakhs and Rs. Five lakhs, the income tax rate is 20% and above Rs. Five lakhs, the marginal or the highest rate of income tax i.e. 30% is applicable. With rise in national income and consequent rise in personal incomes, the people will have to pay a larger percentage of their incomes in the form of income tax which reduces disposable incomes. Personal income tax therefore automatically reduces the consumption demand and hence the aggregate demand. The fall in aggregate demand checks the inflationary tendencies in the economy. The reverse happens in the case of fall in national income on account of recession when the decline in the disposable income of the people is less than proportionate to the fall in national income. However, the utility and efficiency of personal income tax as an automatic stabilizer particularly in the expansionary phase of a business cycle largely depends upon the honesty of the tax payers. Similarly, taxes on corporate or company incomes are also levied. However, in India, a flat rate of 30% corporation tax is levied unlike personal income tax which is progressive in nature. Nonetheless, the impact of corporation tax as a built-in automatic stabilizer of business cycle would be the same as that of personal income tax.
2. **Transfer Payments:** Transfer payment is a fiscal instrument which redistributes income in favor of the poor. For instance, unemployment allowance, subsidies on food and inputs, and other welfare oriented programs such as free housing for the homeless etc increase the level of aggregate demand during a recession and thus reduce the impact of recession on income and employment. Similarly, during the prosperity phase, the quantum of transfer payments reduced, thus reducing the level of aggregate demand and inflationary tendencies.
3. **Corporate Dividends:** The Corporate Sector follows a stable dividend policy through the business cycles. Hence, consumption expenditure on account of dividend receipts remains more or less stable at all times. During a recession, people who receive dividends on their equity investments will have the same consumption expenditure as in the case of an economic boom. Thus dividend earners will be spending relatively more during a recession and less during the prosperity phase. A stable dividend policy therefore has a mitigating effect on both inflation and recession.

To conclude with this section on discretionary and non-discretionary fiscal policy, it must be stated that the success of a non-discretionary fiscal policy of automatic stabilizers is contingent upon a number of uncontrollable variables such as tax compliance, honest declaration of incomes, a stable dividend policy and more or less transparent economic system. For instance, the parallel economy in India is conservatively estimated about fifty per cent of the national income and hence it will be difficult to say that non-discretionary fiscal policy will have any significant role in controlling business cycles. By all means, the discretionary fiscal policy will have a direct and all pervasive impact on the economy and therefore it is found to be more effective in controlling business fluctuations.

6.3.3 Limitations of Fiscal Policy as a Contra-Cyclical Measure

In the early years of Keynesian revolution beginning with the 1940s, fiscal policy was considered the most powerful macro-economic tool and a balanced remedy for controlling business fluctuations through the management of aggregate demand. However, lately, beginning with the 1970s, fiscal policy as a macroeconomic tool, particularly in the context of inflation management had lost much of its sheen and has therefore lost much of its attractiveness as a stabilization tool to policy makers and macro economists. The loss of effectiveness or attractiveness of fiscal policy was due to the limitations that emerged during the course of its operation since the Keynesian revolution. These limitations emerged from factors such as timing, politics, macro-economic theory and the size of the fiscal deficit. We discuss below, the limitations of fiscal policy as a stabilization tool.

1. **Long Time-span between Cyclical Shock and Effective Response:** The time span between cyclical shock and effective response is quite long. Nobody really knows the exact timing of the up-turn and down-turn and everybody starts talking about these turns when have actually happened. Thus the timing of business fluctuation, particularly, the one which is economy wide cannot be accurately forecasted. **The failure of policy makers and macro-economists to foresee cyclical turns is described as ‘recognition lag’ by Prof. Samuelson and Prof. Nordhaus.** The time lag on account of recognition lag is compounded by the ‘response lag’. Fiscal measures are debated and cleared in the parliament. **The time consumed on deciding on the measures, debating and then clearing the measures is known as the ‘response lag’.** Finally, when taxes are increased or decreased and public expenditure is raised or lowered, the economy takes quite some time before it responds to the fiscal measures undertaken by the government. Greater the response time of the economy, lower will be the effectiveness of the fiscal measures and vice-versa. **Thus, the time taken by the economy respond to the fiscal measures is known as the ‘effectiveness lag’.** Prof. Samuelson and Prof. Nordhaus observe that the response lag for fiscal policy is so long that it becomes useless for stabilization. Though this observation is made

in the context of Presidential recommendation and Congressional action in the United States, the parliamentary debates, decisions and actions in the Indian context are no exception.

2. **Difficulty in Raising Taxes and Reducing Expenditures:** A reduction in taxes and an increase in public expenditure during a cyclical downturn will be welcomed by one and all. However, during the cyclical up-turn, in order to control inflationary tendencies, if taxes are raised and public expenditure is reduced, it will be met with widespread resistance and criticism thus delaying the implementation and effectiveness of an anti-inflationary fiscal policy. Further, no government will think of implementing unpopular policies like increasing taxes and reducing public expenditure at the cost of political power in a democracy. For instance, after the economic crisis of 1991, the Government of India targeted a Central fiscal deficit of four percent of the GDP. It was only 1995-96 and 1996-97 that the government was able to reach anywhere near the target with 4.2 and 4.1 per cent during these two years. However, thereafter, the fiscal deficit has all along remained high and beyond the five per cent mark. The Indian economy had been and is being plagued by inflationary pressures right from the second five year plan and high fiscal deficits are considered to be potentially inflationary. Further, even if the fiscal measures are implemented in a timely and speedy manner, studies indicate that people realize that tax changes are temporary and that status-quo ante will be restored and hence they do not change their spending patterns very much. Further, the temporary changes in taxes have very little impact on their permanent or lifetime incomes.
3. **Large Fiscal Deficits and Lack of Upward Flexibility:** Fiscal deficits both Central and combined are already very high. For instance, the Central fiscal deficit of India in 2000-01 was of the order of 5.1 per cent of GDP and the combined fiscal deficit i.e. the deficits of the Centre and the States was more than 10 per cent of the GDP. In such a situation there is little or no scope of increasing public expenditure or reducing taxes even when the economy is in a state of recession and the unemployment levels are high. In the Indian context, in the year 1998-99, 99-2000 and 2000-01, economic growth rate has consistently fallen. However, there were no fiscal boosters from the finance minister. Instead, the finance minister has relied more on monetary measures such as reduction in interest rates and increase in money supply.

6.3.4 Contra-Cyclical Monetary Policy

Monetary policy has two contra-cyclical options. One is an expansionary or cheap monetary policy which is adopted during a recession and the other one is a contractionary or dear monetary policy which is adopted in an inflationary situation. For instance, the RBI adopted a contractionary monetary policy when the inflation rate climbed up to 12.91 per cent in August 2008. Due to the impact of the global recession on the Indian

economy, the growth rate fell down in the year 2008-09 to 6.5 from a high of nine per cent growth in 2007-08 and the average annual growth rate of 8.9 per cent during the period (2003-08). The inflation rate in March 2009 was only 0.26 per cent. The economy was in recession and hence the RBI adopted an expansionary monetary policy to help the economy clock a higher rate of growth.

1. **Expansionary Monetary Policy:** When the Central Bank adopts an expansionary monetary policy, the supply of money expands leading to an upward shift in aggregate demand. The tools of monetary policy are activated to increase the supply of money. The Central Bank may therefore purchase government securities in the open market through the open market operations, the lower the Cash Reserve Ratio, reduce the bank rate or the discount rate. The Central Bank may also implement selective measures of expansion such as consumer credit and reduce margin requirements. Expansionary monetary policy helps to reduce the cost of credit and increase the availability of credit which finally leads to increase in aggregate demand. Increase in aggregate demand will bring about increase in investment, employment, output and income. Higher incomes will lead to higher demand. Prices begin to rise gradually and optimism returns back to the economy. The economy is thus pulled out of the grip of recession and once again put on the growth path.

Limitations

Expansionary monetary policy may not be successful in case of a severe depression when the economy is caught in widespread pessimism. The demand for loanable funds may not be there even if the rate of interest is near zero levels because the demand for loanable funds depends not only on the rate of interest but more importantly on the profitability of investment. Further, at very low rates of interest, the demand for money becomes perfectly elastic i.e. individuals hold on to their money balances with an expectation that the rate of interest will rise in future. Thus under conditions of depression, an expansionary monetary policy must work along with an expansionary fiscal policy. The fiscal stimulus is more effective in such situations and monetary policy may only supplement and complement the fiscal effort

2. **Restrictive Monetary Policy:** A restrictive or dear monetary policy is used to reduce the supply of money and raise the rate of interest in the economy so that aggregate demand is reduced and inflationary conditions are brought under control. Dear or tight money policy is therefore used to control inflationary conditions in the economy. The Central Bank may raise the bank rate, conduct open market operations to sell treasury bills, increase the cash reserve ratio and also impose selective measures of credit control such as credit rationing and higher margin requirements. Higher rate of interest will reduce investment demand in the economy. This in turn will reduce the level of employment, output and income. Lower level of income will reduce aggregate demand and the rate of inflation will be brought down.

Limitations

If the business environment is highly optimistic, firms may continue to borrow money at higher interest rates thereby increasing the inflationary pressure and reducing the effectiveness of restrictive or dear money policy. However, higher interest rates are effective in controlling consumption demand in the economy and if the consumption demand falls as a result of tight monetary policy, investment demand in turn will also fall. The monetary policy will therefore be successful in controlling inflationary pressures in the economy.

6.4 THEORIES OF TRADE CYCLES

6.4.1 Trade Cycle Theory by JR Hicks

JR Hicks in his work 'A Contribution to the theory of the Trade Cycle' based his theory of trade cycles on the interaction between the multiplier and the accelerator by selecting some values of MPC and the capital output ratio. In order to explain real world business cycles, Hicks introduced the role of buffers. Hicks say that there is an output ceiling at full employment level which prevents income and output to go beyond. There is also a lower limit below which income and output cannot go because of autonomous investment. Hicks further states that business cycles occur in the background of real economic growth. Cyclical fluctuations in real output takes place above and below the rising trend line of real economic growth. Hicks therefore explain business cycle with an equilibrium rate of growth. The long run equilibrium growth is determined by autonomous investment and the values of the multiplier and the accelerator. Autonomous investment according to Hicks is a function of technological progress, innovations and population growth and the rate of growth of autonomous investment is constant. It is also independent of the growth rate of the economy. Induced investment is dependent on changes in the level of output and therefore a function of the growth rate of the economy. The accelerator is based on induced investment and along with the multiplier works to cause business cycles. Hicks defined the accelerator as the ratio of investment to the increase in income. With the constant values of the twin propellers, equilibrium income will grow at a rate equal to the rate of growth of autonomous investment. Economic fluctuations are caused due to the leverage effect of the twin propellers.

Assumptions of the Model

Hicks's theory of trade cycle is based on the following assumptions:

1. A progressive economy in which autonomous investment increases at a constant rate so that the system remains in a moving equilibrium.
2. The saving and investment coefficients are disturbed overtime in such a way that an upward displacement from the equilibrium path leads to a lagged movement away from equilibrium.

3. The values of the multiplier and the accelerator are constant and therefore have a strong tendency to destabilize the economy in reaction to a disturbance in such a manner that any upward displacement from the equilibrium path will not be self-correcting but will cause a continuing movement of the explosive variety away from equilibrium.
4. The economy cannot expand beyond the point of full employment and therefore it is the limit to expansion of the economy.
5. The working of the accelerator during the downswing provides an indirect restraint on the downward movement of the economy. The rate of decrease in the accelerator is limited by the rate of depreciation in the downswing.
6. The relation between the twin propellers is treated in a lagged manner because consumption and induced investment are assumed to operate with a time lag.
7. The average capital output ratio is greater than one and gross investment does not fall below zero. The trade cycles are therefore explosive but limited by the upper ceiling and the lower floor or the lower limit.

In Fig. 6.5, curve AA shows the path of autonomous investment growing at a constant rate. EE is the equilibrium level of output which is a function of autonomous investment or curve AA. Curve EE is derived from AA by the application of the multiplier and the accelerator. Curve FF is the full employment ceiling above the equilibrium level or the path EE and is growing at the constant rate of autonomous investment. Curve LL is the lower equilibrium path of output representing the lower limit or the 'slump equilibrium curve'. Hicks explain the occurrence of trade cycle beginning with point P0 on the equilibrium path EE when an increase in the rate of autonomous investment leads to an upward movement in income. Consequently, the growth of output and income accelerated by the combined effect of the multiplier and the accelerator moves the economy on the expansion path to P1 which is located on the FF curve. This upswing is based on the standard cycle and given the values of the two propellers leads to an explosive situation. Due to supply bottlenecks, the level of output does not go beyond the upper limit and remains at point P1. Hicks finds himself in agreement with Keynes in this context when he says "I shall follow Keynes in assuming that there is some point at which output becomes inelastic in response to an increase in effective demand."

When the economy reaches the full employment ceiling at point P1, it creeps along the ceiling till point P2 given the investment lag. It means that the downward cycle does not begin immediately at point P1. According to Hicks, greater the investment lag, longer the economy moves along the ceiling path. Since the level of output and income has decreased after point P1, investment begins to decline. Reduced investment is not good enough to keep the economy at the full employment growth path. As a result, the economy moves to lower levels of income and output thereby begins the

downswing of the business cycle. Now the reverse of the multiplier and the accelerator is in operation which takes the economy on the downward path to intercept the lower limit of growth path. The fall in output may be steep such that the economy moves along points P2 P3 Q. If the slump is strong, induced investment will fall to zero and the value of the accelerator will also be zero. The rate of decrease in investment is limited by the rate of depreciation. The total amount of investment in the economy is equal to autonomous investment minus the constant rate of depreciation. Since autonomous investment is taking place, the fall in income and output is gradual and the slump is seen to be longer than the boom as indicated by Q1Q2. At point Q2, the downswing reaches the lower limit of contraction. The economy moves along the path of contraction till point Q3 due to excess capacity. When the excess capacity is fully utilized, autonomous investment will cause employment, output and income to rise leading to increase in induced investment and the consequent operation of the twin propellers in the economy namely the multiplier and the accelerator will once again cause the cyclical curve to intercept the full employment curve or the upper ceiling. The cyclical process of expansion and contraction repeats in this manner in the economy in a periodic manner.

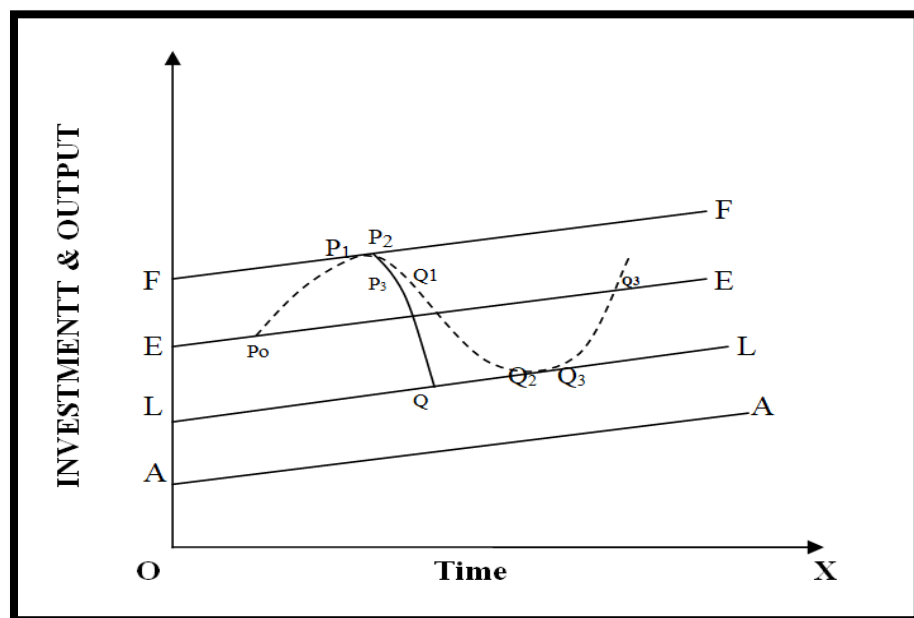


Fig. 6.5 - Hicks Model of Trade Cycle

Hicks assign a role for monetary factors in his trade cycle theory. During the expansion phase, if banks pursue the policy of credit contraction, the downswing may start before reaching the full employment ceiling. When profits fall during the downswing, liquidity preference will increase leading to fall in loanable funds. In this way, monetary factors may increase the intensity of the downswing.

Limitations of the Theory of Trade Cycles of JR Hicks

Hicks assume that the value of the multiplier remains constant across the cycle because the consumption function is constant. However, according to Friedman, the MPC does not remain constant with cyclical changes in

income and hence the value of the multiplier changes in different phases of the trade cycle. A constant value to the accelerator based on the assumption of a constant capital output ratio. However, the capital output ratio is determined by technological changes, the nature and composition of investment, the gestation period of capital goods etc. Lundberg says that the assumption of a constant accelerator should be relaxed for a realistic understanding of trade cycles.

Hicks also assume that autonomous investment continues at a steady pace. However, during a financial crisis in a period of contraction, autonomous investment may fall below its normal level. According to Schumpeter, autonomous investment may fluctuate due to technological innovations. In the Hicks model, growth is contingent upon autonomous investment. It is a flurry of autonomous investment from the equilibrium path that leads to growth. According to Smithies, the source of growth should lie within the system. In imputing growth to an unexplained external factor, Hicks has failed to provide a complete explanation of the cycle.

Duesenberry and Lundberg believed that the distinction between autonomous and induced investment is not practical. For Lundberg, every investment is autonomous in the short run and a major amount of autonomous investment becomes induced in the long run. Sometimes the total investment is split into autonomous and induced as in the case of machinery. According to Duesenberry, the ceiling fails to explain the onset of depression. The ceiling may check growth but not cause the downswing. Shortage of resources cannot lead to a decline in investment and cause a downswing. The downswings of 1873-1921 and 1953-54 were not caused due to shortage of resources. Hicks admitted that the downswing may begin before reaching the full employment limit on account of monetary factors.

According to Hicks, autonomous investment brings a gradual movement toward the lower limit and an increase in autonomous investment causes the lower turning point. Harrod does not accept Hicks' argument because depression may actually discourage autonomous investment. According to Rending Fels, recovery may begin even in the presence of excess capacity. Hicks assumed that the full employment ceiling is independent of the path of output. According to Dernburg and McDougall, full employment depends on the availability of resources and when the capital stock is increasing in any given period, the full employment ceiling is automatically raised.

Hicks's presentation of the theory is considered mechanical because of the constant values given to the MPC and the Accelerator says Kaldor and Duesenberry. It is therefore a mechanical explanation in which human judgment, business expectations and decisions have no role to play and only investment plays a leading role which is driven by formula and not by judgment.

Finally, Hicks has been criticized for saying that the contraction phase is longer than the expansion. However, post-war facts have proved it otherwise. Nonetheless, Hicks theory of trade cycle is considered superior

to the earlier theories in explaining the turning point of the business cycle. Dernberg and McDougall say “The Hicks model serves as a useful framework of analysis which with modification yields a fairly good picture of cyclical fluctuation within a framework of growth. It serves to emphasize that in a capitalist economy having substantial amounts of durable equipment, a period of contraction inevitably follows expansion. Hicks’s model also points the fact that in the absence of technical progress and other growth factors, the economy will tend to languish in depression for long periods of time.”

6.4.2 Joseph Schumpeter’s Theory of Business Cycle

Joseph Alois Schumpeter presented his theory of economic growth in ‘Theory of Economic Development’ published in 1911. The theory was further developed by Schumpeter in his later works ‘Business Cycles (1939)’ and ‘Capitalism, Socialism and Democracy (1942)’.

Schumpeter begins his theory by assuming a perfectly competitive stationary economy i.e. the economy is in competitive equilibrium with no profits, no interest rates, no savings, no investments and non involuntary unemployment. The economy is in a stationary circular flow. Development is spontaneous and discontinuous change in the channels of the circular flow, disturbance of equilibrium which permanently changes and displaces the equilibrium state previously existing. Development or discontinuous changes occurs in the sphere of industrial and commercial life. Development consists in the carrying out of new combinations for which possibilities exist in the stationary state and new combinations come in the form of innovations.

Innovations

An innovation may consist of:

1. The introduction of a new product.
2. The introduction of new method of production.
3. The opening up of a new market.
4. The conquest of a new source of supply of raw materials or semi-finished goods, and
5. Carrying out of the new organization of any industry like the creation of a monopoly.

The introduction of a new product and the continual improvements in the existing ones lead to development.

The Role of the Innovator

The entrepreneur is the innovator. He directs the use of financial resources. He is motivated by:

1. The desire to found a private commercial kingdom.
2. The will to conquer and prove his superiority, and

3. The joy of creating, of getting things done or exercising one's energy and ingenuity.

The nature and activities of the entrepreneur depend upon on his social and cultural environment. In order to perform his economic function, the entrepreneur requires two things. Firstly, the existence of technical knowledge is required in order to produce new products. Secondly, the power of disposal over the factors of production in the form of credit is required. According to Schumpeter, a reservoir of untapped technical knowledge exists which he can make us of. Credit is thus essential for development to begin.

Role of Profits

The entrepreneur innovates to earn profits. Profits are a surplus over costs. Under competitive equilibrium, the price of each product just equals cost and therefore there are no profits. Profits arise due to dynamic changes resulting from an innovation and continue to arise till the innovation become general.

Breaking the Circular Flow of Economic Activities

The circular flow of economic activities can be broken by the introduction of innovation by an entrepreneur. The entrepreneurs are financed through bank credit. Investments in innovations are risky and hence interest is levied on bank finance. When the new innovation becomes profitable, other entrepreneurs follow in 'swarm-like clusters'. Innovations in one field may induce other innovations in related fields. The emergence of a motor car industry may in turn stimulate a wave of new investments in the construction of highways, rubber tyre and petroleum products. But the spread of an innovation is never 100 per cent. The spread of innovation is shown in Fig. 6.6 where the percentage of firms adopting a particular innovation is shown on vertical axis and time taken on the horizontal axis. The curve OI shows that firms adopt an innovation slowly to start with but soon the adoption of innovation gains momentum. However, it never reaches 100 per cent adoption.

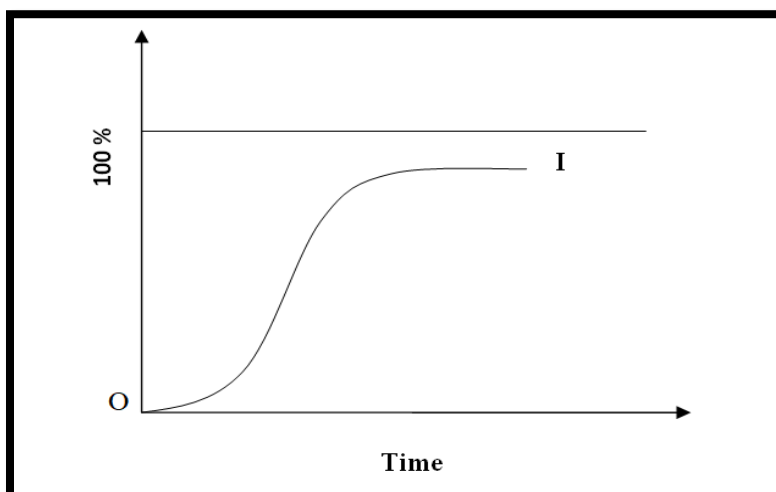


Fig. 6.6 – The Spread of Innovations

The Cyclical Process

Investment financed by bank credit leads to expansion in money incomes and prices and thus an overall expansion in the economy. When consumers' income increases, the demand for old products also increases. Supply falling short of demand, the prices of goods increase leading to higher profitability. With more profits, old industries expand their scale of operations with the help of bank credit. New investments lead to a secondary wave of credit inflation over and above the primary wave of innovation. Undue optimism and speculation lead to a greater boom. After a period of gestation, new products appear in the market by displacing the old products. The demand for old products begins to decrease and a process of liquidation, re-adjustment and absorption begins. As the innovators start repaying bank loans out of profits, the quantity of money is decreased and prices tend to fall. Profits decline. Uncertainty and risk increase and the motivation for innovation being reduced, the cycle of expansion comes to an end. Expansion is followed by depression.

Schumpeter believed in the existence of the Kondratieff long-wave of upswings and downswings in economic activity. During the upswing mass production takes place and during the downswing the process of adjustment takes back the economy to a lower equilibrium level. Overtime, the recovery process begins and the economy is back again at a higher level of equilibrium. Schumpeter describes this process of capitalist development as one of 'creative destruction' wherein the old economic structures of society are being continually destroyed and the new structures are being continually created in their place. This process is shown in Fig 6.7 in which the curve YPT shows the long run cyclical upswings and downswings. When there is a new innovation, the economy moves upwards from Y and production process up to P. When this innovation ends and a new innovation starts and replaces the earlier one, output level falls from P to T which is higher than the earlier point Y which shows the development of the economy.

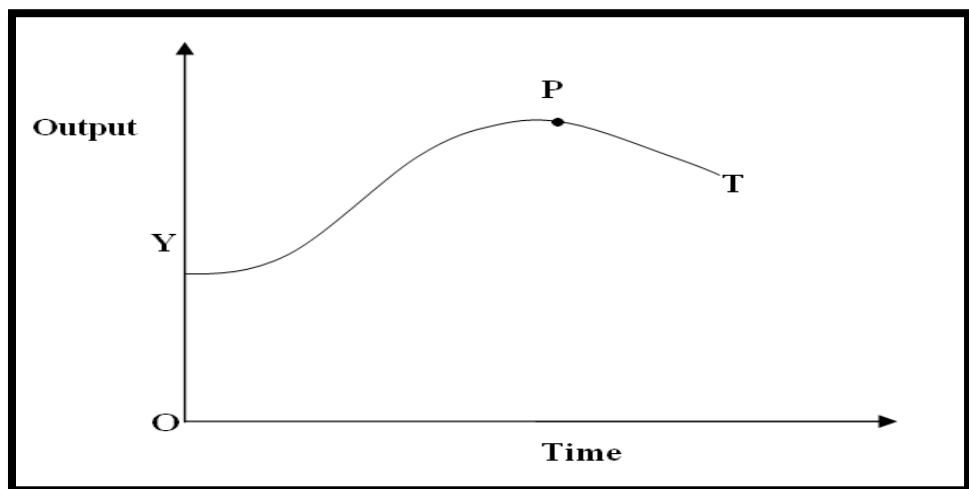


Fig. 6.7 – The Process of Creative Destruction and Development

The cyclical process of economic development is shown in Fig.6.8 where the secondary wave old industry expansion is superimposed on the primary wave of innovation. Development takes place more rapidly in the expansion phase. The recessionary phase extends below the equilibrium level and enters depression and new innovation leads to revival in the economy. Entrepreneurs are the key to economic development and cyclical swings are the cost of economic development under capitalism. Technological progress has endless increasing returns and the rate of profit will always be positive. The capitalist society is in a state of endless expansion. However, the capitalist system of production is eventually destroyed because the process of capitalist development weakens the institutions and values basic to its own survival. Capitalism undermines the social institutions which protect it and creates conditions in which it destroys itself thereby paving the way for socialism.

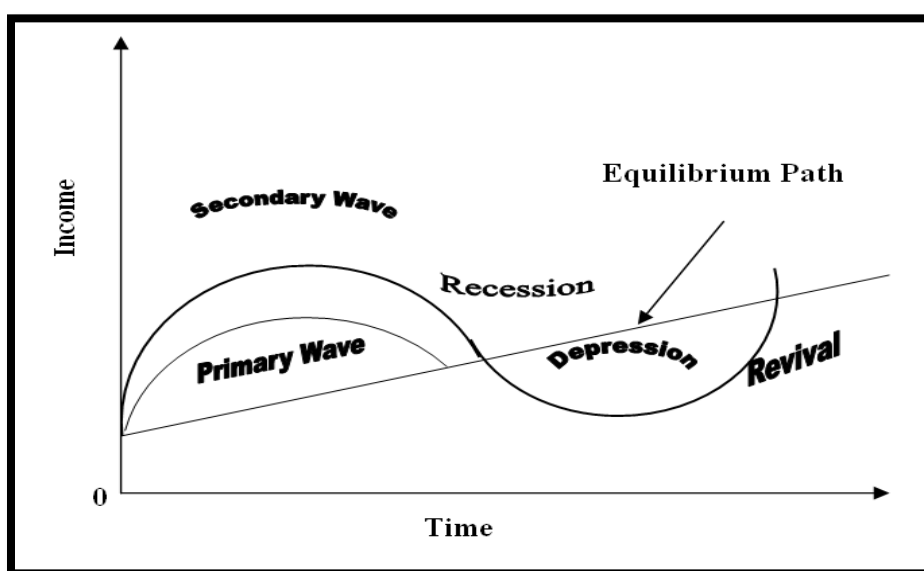


Fig.6.8 – The Cyclical Process of Economic Development.

Limitations of Schumpeter's Theory

The role of innovation in the growth of the capitalist society has been clearly brought out by Schumpeter. Similarly, when the capitalist system begins to decline, the role of the intellectual class in hastening its eventual demise is also brilliantly brought out by Schumpeter. Joseph Schumpeter has therefore earned his place in the galaxy of other great theorists like Adam Smith, Karl Marx, Alfred Marshall and John Keynes. However, the theory of innovation is not free from its own limitations.

- 1. Innovations are Routine in the Modern Times:** 20th Century capitalism also saw the emergence of the managerial revolution and the rise of joint stock companies. Innovations have become an everyday affair in the modern times in all areas of production. The capitalist system survives on ever increasing demand for goods and services. Endless innovations generate replacement demand and fire the engine of capitalism. The role of the innovator entrepreneur has been taken over by the professional managers of modern industry.

2. **Business Cycles are not an essential part of the Development Process:** Business cycles are inevitable but not essential to the process of economic development in a capitalist system. Economic development is a process of continuous positive change and not a discontinuous change as brought out by Schumpeter.
3. **Cyclical Changes do not take place due to Innovations:** Cyclical changes in the economy takes place due to psychological, natural, political and financial factors. For instance, the global financial crisis of 2008 gave birth to recession in India, United States and other European countries. The Middle East political crisis and the Taliban Government in Afghanistan is a damp on world capitalism as potential demand for goods and services is being destroyed by forcing the people to follow a traditional way of life.
4. **Undue Importance to Bank Credit:** Bank credit may be important in the short run. However, in the long run when the need for capital is much larger, bank credit will be insufficient and firms will have to tap the capital market.
5. **Role of Voluntary Savings is ignored:** According to critics, if an innovation is financed through voluntary savings or undistributed profits or reserves, it will not cause price rise and therefore a cyclical swing may not take place.

6.4.3 Goodwin's Model of Business Cycle

Goodwin's model is an extension of Hicks's model of business cycle. According to Goodwin, growth in labor force and improvements in techniques of production are important factors determining economic growth. These two factors contribute to persistent growth in the productive capacity of the economy but not in demand. Adequate growth in demand is achieved through occasional bursts of investment in innovations. Goodwin assumes that structural coefficients of the economy such as the MPC or the MPS and the capital output ratio are such that they lead to explosive oscillations. Once the investment cycle begins, it carries the capitalist economy to full employment and the upper limit rises rapidly with capital accumulation which leads to technological progress. The expansion of the economy is thus constrained by the full employment ceiling. Once the economy reaches the peak, certain forces push the economy in a downward spiral. In this the model presents a two-phase cycle consisting of full employment and deep depression.

In Goodwin's scheme of things, capital stock is an important variable. Goodwin's accelerator is flexible and his capital output ratio is non-proportional. According to him, net investment will be undertaken as long as desired capital stock is greater than existing capital and disinvestment will take place if desired capital stock is less than the existing capital stock. The equation of cyclical growth can therefore be stated as follows:

$$K^* = VY + \beta(t) \quad \dots\dots\dots(1)$$

Where V is the accelerator coefficient or the capital output ratio, Y is the output and $\beta(t)$ represents change in technology or technique of production. According to equation (1), innovation or technological progress implies that more capital is desired with a given output and the accelerator (V) implies that more capital is desired with increased output. Equation therefore explains the idea of a flexible accelerator. Goodwin says that even if $\beta(t)$ in equation (1) is ignored, it does describe the traditional accelerator principle which assumes a perfect adjustment of capital to output at all times.

In Goodwin's model, it is assumed that with a given stock of capital, greater than or less than the designed output can be produced. There is some peak-load capacity in the designed capacity which can be used to produce more than the designed output. However such an effort comes at a cost and hence there would be pressure to expand capital and capacity. In the short run therefore the accelerator does not work. The need to expand capital stock is proportional to the difference between the desired and the actual capital stock subject to non-linear constraints. The upper limit is the full employment ceiling as brought out by JR Hicks whereas the lower limit is set by the rate at which capital can be scrapped at zero gross investment which means depreciation allowance is not spent on capital replacement. Therefore, according to Goodwin:

$$I = \lambda (K^* - K) \quad \dots\dots\dots(2)$$

where λ is the proportion of the difference between desired and the actual capital stock which determines investment. Equation (2) is the supply side of the model because it is investment that expands the capacity to produce. Demand is given by the Keynesian multiplier in the model which can be stated as follows:

$$Y = f(I) \quad \dots\dots\dots(3)$$

The relation between income Y and investment I depends on the size of the multiplier which in turn is determined by the MPC or the MPS. According to Goodwin, the MPC is high in the downswing because expenditure is sticky downwards. By substituting the value of K^* in equations one and two, we get the following:

$$I = \lambda [vY + \beta(t) - K]$$

Since $Y = f(I)$,

$$I = \lambda[v f(I) + (\beta(t)) - K]$$

$$I = \lambda v f(I) + \lambda \beta(t) - \lambda K$$

$$\lambda K = \lambda v f(I) + \lambda \beta(t) - I$$

Dividing both sides by λ , we have:

$$K = v f(I) + \beta(t) - \frac{I}{\lambda} \quad \dots\dots\dots(4)$$

It follows that the capital stock (K) is a function of investment (I) and technological change $\beta(t)$.

Goodwin's Framework

The model explained above is used by Goodwin to explain business cycle. Net investment in the model is $K^* - K$. If $K^* > K$, capital accumulation will take place. However, the gap cannot be filled immediately. Net investment in a given period will be equal to fixed gross investment minus depreciation. If $K^* = K$, net investment will be nil. If $K^* < K$, net investment will be negative and will be equal to depreciation.

If technology is constant and the economy is in the expansion phase and $K^* > K$, then net investment will take place until $K^* = K$. As a result, there will be expansion in output, income and employment through the interaction of the multiplier and the accelerator and the economy will continue to expand until full employment is achieved. After this point, net investment will fall and the economy will take a negative turn until gross investment falls to zero. However, capital stock continues to depreciate until the capital stock falls below the minimum required in a depression. In this manner, expansion and contractions take place in the economy.

Economic Growth and Business Cycles

According to Goodwin, the size of the labor force and the increase in the productivity of labor consequent to improvements in technology and innovations are the two sources of economic growth which also determines cyclical growth. Goodwin assumes that all growth in the full employment ceiling occurs during the expansion. With rising output levels there is also a large increase in the desired capital stock and the rate of increase in the desired capital stock is determined by the rate of economic growth. The expansion period is determined by the overtime rise in output along with the rise in capital stock. According to MJC Surrey, a steady rise in $\beta(t)$ will prolong the expansion and shorten the depression and variations in $\beta(t)$ may lead to differences between cycles both overtime and between countries.

Assessment

Goodwin assumes an economy which is inclined towards explosive oscillations. These oscillations are constrained by the ceiling and the floor i.e. the upper limit of expansion and the lower limit of depression. However, Goodwin's model does not explain how an economy is stuck in a low equilibrium trap over a long period. Ragnar Frisch says that an economy requires persistent random shocks to macro economic variables to realize business cycles and economic growth. The accelerator, the multiplier and random shocks put together generate the oscillations that both Goodwin and Hicks had explained in their theories of trade cycles.

6.4.4 Samuelson's Model of the Trade Cycle

Samuelson constructed a multiplier-accelerator model assuming one period lag and different values for the MPC (α) and the Accelerator (β) which result in changes in the level of income and output relevant to five different types of fluctuations. The model can be stated as follows:

$$Y_t = G_t + C_t + I_t \quad \dots(1)$$

Where Y_t is the national income at time (t) which is the sum of government expenditure (G_t), consumption expenditure (C_t) and induced investment (I_t).

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

$$I_t = \beta(C_t - C_{t-1}) \quad \dots(3)$$

By substituting equation (2) in (3), we get:

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

$$I_t = \beta\alpha Y_{t-1} - \beta\alpha Y_{t-2} \quad \dots(4)$$

$$G_t = 1 \quad \dots(5)$$

By substituting equations (2), (4) and (5) in (1), we get:

$$Y_t = 1 + \alpha Y_{t-1} + \beta\alpha Y_{t-1} - \beta\alpha Y_{t-2} \quad \dots(6)$$

$$= 1 + (\alpha Y_{t-1} + \beta\alpha Y_{t-1}) - \beta\alpha Y_{t-2}$$

$$= 1 + \alpha(1 + \beta)Y_{t-1} - \beta\alpha Y_{t-2} \quad \dots(7)$$

According to Samuelson, if we know the national income for two periods, the national income for the next period can be derived by taking a weighted sum. The weights depend upon the values of MPC and the accelerator. Assuming ($0 < \alpha < 1$) i.e. the value of MPC is greater than zero but less than one and that the value of the accelerator is greater than zero ($\beta > 0$), Samuelson explains five types of cyclical fluctuations which are given in Table 6.1.

Table 6.1 – Samuelson's Interaction Model

Case	Values	Behavior of the Cycle
1	$\alpha = 5, \beta = 0$	Path without cycles
2	$\alpha = 5, \beta = 1$	Damped fluctuations
3	$\alpha = 5, \beta = 2$	Fluctuations with constant amplitude
4	$\alpha = 5, \beta = 3$	Explosive cycles
5	$\alpha = 5, \beta = 4$	Explosive path without cycles

Samuelson's Case One shows a cycle-less path as it is based only on the multiplier effect as the value of the accelerator is zero (See Fig. 6.9 (A)). Case Two shows a damped cyclical path fluctuating around the static multiplier and gradually subsiding to that level as shown in panel (B). Case Three shows business cycles of constant amplitude repeating around the multiplier level (Panel C). Case Four shows explosive cycles (Panel D) and Case Five shows an explosive upward path without cycles approaching a compound rate of growth (Panel E).

Notice that only three cases qualify to be cycles: 2, 3 & 4 in panels B, C & D of Figure 1.9. Constant cycle as seen in Panel C is a theoretical case. Case 2 related to damp cycle occurs irregularly in a milder form. For instance, cycles in the post-war period have been relatively damp as

compared to cycles in the inter-war period. Damp cycles are a consequence of erratic shocks arising from exogenous factors such as wars, crop situation, inventions etc. These instances may be expected to occur persistently. Case four depicts explosive cycles which, however, do not have a real life example because their occurrence is prevented by anti-cyclical monetary and fiscal policies which are considered endogenous factors.

Assessment of the Model

The interaction of the multiplier and the accelerator can raise national income at a faster rate than what they can do singly. The model therefore not only explains business cycles but also becomes a guide to stabilization policy. Professor Kurihara said “It is in conjunction with the multiplier analysis based on the concept of MPC being less than one that the acceleration principle serves as a useful tool of business cycle analysis and a helpful guide to business cycle policy.” The greater the value of the accelerator (β), greater is the chance of an explosive cycle. The greater the value of the multiplier, the greater will be the chance of a cycle-less path. Professor Estey observed, “Thus the combination of the multiplier and the accelerator seems capable of producing cyclical fluctuations. The multiplier alone produces no cycles from any given impulse but only a gradual increase to a constant level of income determined by the MPC. But if the principle of acceleration is introduced, the result is a series of oscillations about what might be called the multiplier level. The accelerator first carries total income above its level but as the rate of increase of income diminishes, the accelerator introduces a down-turn which carries total income below the multiplier level, then up again and so on.”

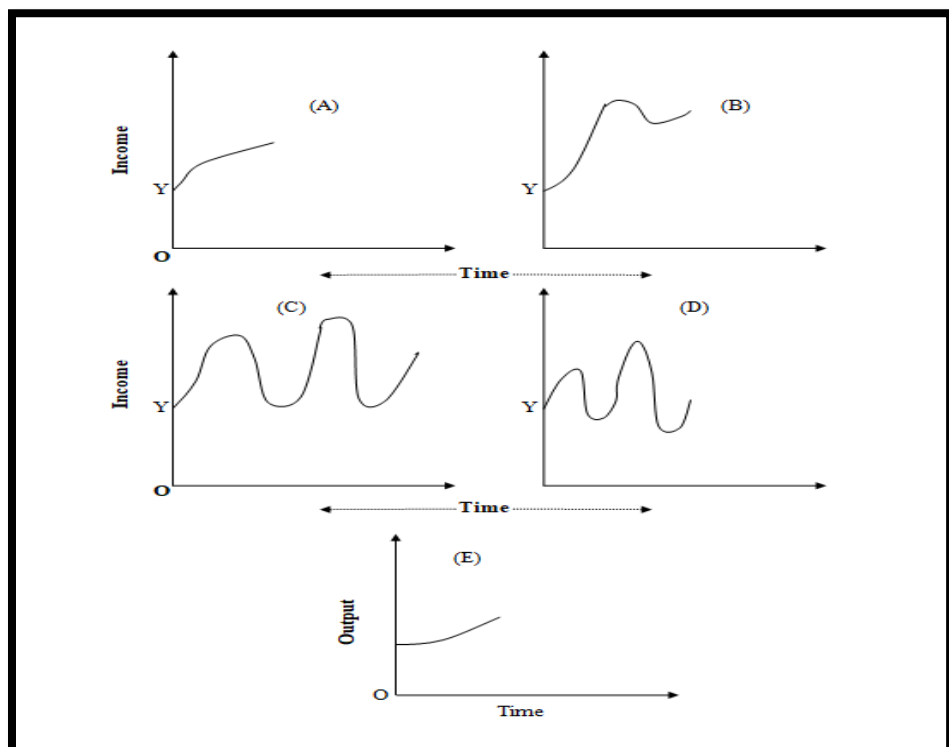


Fig. 6.9 – Samuelson's Trade Cycles.

Notwithstanding the utility of the model, the following limitations have been identified:

1. The length of the period of each cycle remains not identified.
2. The model assumes both the MPC and the Accelerator is constant. However, they change with the level of income.
3. The cycles explained in this model oscillate about a stationary level in a trendless economy. Economic growth is a process and the trend can be identified.

6.5 QUESTIONS

1. Explain the meaning and features of trade cycle.
2. Explain the phases of business cycle.
3. Explain the features of recession and expansion.
4. Explain the fiscal policy measures used to control business cycles.
5. Explain the limitations fiscal policy as a contra-cyclical measure.
6. Explain the role of monetary policy as a contra-cyclical measure along with its limitations.
7. Explain and asses Hicks's theory of trade cycle.
8. Critically examine Schumpeter's theory of trade cycle.
9. Critically examine Goodwin's theory of trade cycle.
10. Examine Samuelson's theory of trade cycle.



MODULE 4

SUPPLY AND DEMAND FOR MONEY**Unit Structure:**

- 7.0 Objectives
- 7.1 Introduction
- 7.2 Determinants of Money Supply
- 7.3 Velocity of Circulation of Money
- 7.4 Questions

7.0 OBJECTIVES

- To know the meaning of Money Supply
- To understand the constituents of money supply
- To know RBI approach to Measurement of Money Supply
- To know the factors that affect money supply

7.1 INTRODUCTION

According to Alfred Marshall, "money constitutes all those things which are at any time and place generally accepted without doubt or special enquiry as a means of purchasing commodities and services and of defraying expenses".

The meaning and purpose for which money is used are clearly brought out by D.H. Robertson by stating "Money is anything which is widely accepted in payment for goods or in discharge of other kinds of business obligations".

All these definitions explain the meaning of money through its functions.

That is what the American economist Walker tells us by defining money as "Money is what money does"

7.1.1 Meaning of Money Supply

The quantity of money that people own in spendable form is referred to as the money supply. One significant factor in the creation of economic policy is the money supply.

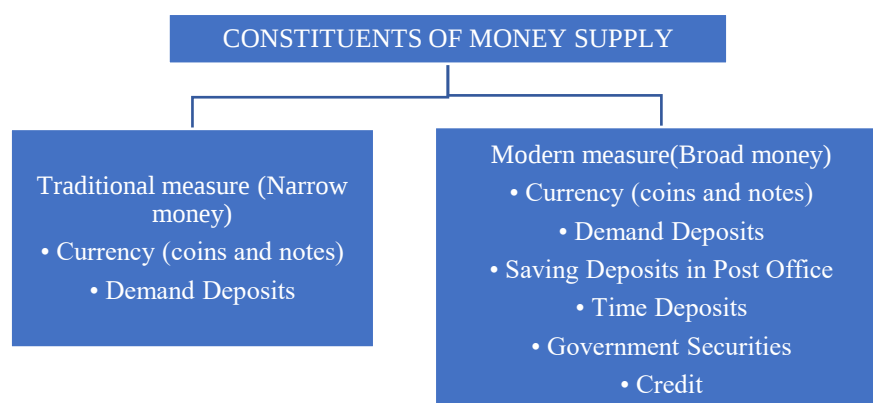
The entire amount of domestic currency that the general public (private citizens and commercial entities) of a nation owns is referred to as its money supply. Money held by the public and in circulation is covered by this definition, but since the Central Bank, commercial banks, and the State Treasury are entities that create money, it is not. Their money isn't really in use throughout the nation. Therefore, the public's stock of money in

spendable form alone at any particular time represents the money supply. The value of stock of money (money supply) can be measured at a given time or on a particular date.

7.1.2 Constituents of Money Supply

There are various approaches regarding the components of money supply. out of them the two approaches are very important namely Traditional and Modern approach

Constituents of Money Supply



[A] Traditional Measure or Narrow Money:

Traditional approach based on the Money as a medium of exchange or as a form of payment function of money. Consequently, the conventional method states that the money supply should consist of these readily consumable goods. According to this standard, the items that make up the money supply can only be those that are widely used as a means of trade. Demand deposits made with the bank and currency (coins and notes) are the liquid forms of money that are widely accepted as a means of exchange. Since checks can be drawn against demand deposits, only these deposits are considered money in banks. Time deposits are excluded from the traditional measure of money as it is not possible to draw a cheque against them. However irrespective of type of deposits, if they can be withdrawn or a payment can be done by drawing cheque on these accounts, then they should be treated as demand deposits. The traditional money is sometimes called "narrow money" since the components of money supply are confined to currency and demand deposits only. Some economists call it transaction measure or "transaction money", as it includes those items that are actually used for transactions. The traditional measure of money supply can be expressed as :

$$M_1 = C + DD$$

where

M_1 = Traditional measure or Narrow Money.

C = Currency (Coins & Notes)

DD = Demand deposits (The chequeable deposits)

The M₁ measure is very near to the RBI's concept of M₁, which includes C, DD and other deposits with RBI ($M_1 = C + DD + OD$). The other deposits (OD) with RBI being negligible can be ignored for all practical

[B] Modern Measure or Broad Money :

A broader concept of money supply has been evolved to include all very close substitutes of money in the measure of money supply. It is also called "**broad money**" since it brings in the items which while not quite as liquid, are highly liquid. Economists like Milton Friedman, Gurley John G, Shaw Edwards (Gurley-Shaw) and Radcliff Committee (The committee appointed to study the working of monetary system in England) are closely associated with the modern approach.

- 1) According to Milton Friedman the money supply concept is wider and includes savings and time deposits with commercial banks, because, time deposits can be made available for spending purposes with limited cost.
- II) According to Gurley-Shaw, even liabilities of Non-Bank Financial Intermediaries (NBFIs) and bonds, shares i.e. various grades of near money which affect aggregate expenditure are included. Money supply is measured as weighted average of currency, demand deposits and near-money assets.
- III) According to the Radcliff Committee approach, all the funds lent by financial institutions should be included because the total money supply is an important policy variable.

7.1.3 RBI's Approach to Measurement of Money Supply:

The Reserve Bank of India appointed the "Second Working Group on Money Supply in India" in 1977 to have a meaningful measure of money supply. The committee in its report pointed out that money supply is not only an economic variable, but it is also a policy controlled variable. When viewed as a monetary variable, it is influenced by the actions of the public and the banks. As a policy controlled variable, it is influenced by the monetary policy of the central bank. The group pointed out that a single measure of money supply would be inadequate and misleading and it is necessary to have a variety of monetary aggregates to measure money supply in a meaningful manner. The group accordingly suggested four measures of money supply. Since 1977 the RBI has been using these measures. Symbolically they are expressed as M₁, M₂, M₃, and M₄. These four measures can be elaborated as follows:

Concept of M₁:

The concept of M₁ is based on the medium of exchange function of money. It measures money supply in the traditional way. It considers only the most liquid items under money supply. It is measured as follows:

$$M_1 = C + DD + OD$$

Where, "C" refers to coins and currency notes with the public.

Cash on hand of all banks is excluded.

"DD" refers to demand deposits with all commercial and cooperative banks. Inter-bank deposits are excluded.

"OD" refers to other deposits with the RBI.

The other deposits with the RBI include the following:

- (1) Deposits of institutions like NABARD, UTI, IDBI etc.
- (2) Demand deposits of World Bank and IMF.
- (3) Demand deposits of foreign Central Banks and Governments.

Certain items are excluded from this other deposits: They are:

- (a) Deposits held by the Central and State Governments.
- (b) Provident funds guarantee funds and adhoc liability items.
- (c) Balance in account No. 1 of the International Monetary Fund.

Thus, M1, consists of all high liquidity items. This M1, differs from High powered money or Reserve Money in terms of its components. While $M_1 = C + DD + OD$, High powered Money

$= C + R + OD$ where 'R' refers to cash reserves of banks.

Concept of M2:

It is a wider concept. It is measured as $M_2 = M_1 + POSBD$

Here, "M1" represents coins, currency notes, demand deposits with banks and other deposits with the RBI. POSBD refers to Post Office Savings Banks Deposits. Compared to demand deposits of banks, POSBD are less liquid. However compared to time deposits, they are more liquid. In the rural areas POSBD are very popular as banking facilities are not adequate.

Concept of M3:

It is known as "Broad Money". It is based on the modern approach to money supply given by Prof. Milton Friedman. M3 is measured as $M_3 = M_1 + TD$

Where "TD" refers to time deposits with all the banks. (it does not include interbank time deposits). M3 is referred as the Aggregate Monetary Resources (AMR). This approach considers time deposits as liquid as loans can be obtained against the deposits and it is also possible to withdraw the deposit before the maturity period. Thus overall money supply in the economy is measured by M3. The concept of M3 was much emphasized by the working group. It is a popular measure used by the RBI in its monetary planning.

Concept of M4:

It is a much wider concept. It is expressed as:

$M_4 = M_3 + TPOD$

Here, TPOD represents the total deposits with post office savings organization. Two types of deposits namely time deposits and savings deposits are included in the total post office savings organization. M4 does not include those deposits in national savings certificate.

The four measures of money supply as used by the RBI can be summarized as follows:

7.1.4 RBI'S New Approach to Money Supply:

In 1998 RBI introduced new measures of money supply as per the recommendations of the Working Group of Money supply.

Accordingly three monetary aggregates names NM1, NM2 and NM: and three liquidity aggregates L1, L2 and L3 were introduced.

They are as follows:

New Monetary Aggregates:

$NM1 = \text{Currency with the public} + \text{Demand deposits with the banks} + \text{other deposits with the RBI.}$

$NM2 = NM1 + \text{Short term deposits of residents (Having a maturity period of one year and less than that NM3} = NM2 + \text{Long term deposits of residents} + \text{Call/Term funding from financial institutions.}$

Liquidity Aggregates:

$L1 = NM3 + \text{All deposits with the post office savings banks(Except NSC)}$

$L2 = L1 + \text{Term deposits with term lending institutions and refinancing institutions} + \text{Term borrowings by Fls} + \text{Certificate of deposits issued by financial institutions.}$

$L3 = L2 + \text{public deposits of non-banking financial companies.}$

7.2 DETERMINANTS OF MONEY SUPPLY

Demand deposits, currency notes, and coins make up the money supply. Commercial banks create demand deposits through the process of credit creation, whereas the central bank issues coins and currency notes. To maintain economic stability, the central bank regulates both the monopoly on note issuance and the credit that commercial banks create. The quantity of coins and currency notes in developing nations is greater than the amount of bank money, while the opposite is true in developed nations. There are numerous elements that affect the money supply besides government and central bank management.

According to Prof. Chandler, the following are the major determinants of money supply in an economy:

- (1) Monetary Base.
- (2) Extent of monetization.

- (3) Community's Choice.
- (4) Cash Reserve Ratio.
- (5) Budgetary Policy of the Government.

These major determinants of money supply can be explained as follows:

1. **Monetary Base:** One of the key elements that determines the money supply is the monetary base. It alludes to the assortment of assets held by the central bank, which serve as the foundation for the issuance of banknotes. The size of the monetary base determines how many currency notes the central bank issues. The supply of money would increase with a larger monetary base and vice versa. Components of the monetary base include the following:
 - a. **Monetary Gold Stock:** The monetary gold stock consists of three components namely:
 - (i) the stock of gold accumulated over a period of time,
 - (ii) the net addition made to the stock of gold from the current domestic production of gold. Here net addition is calculated as: domestic production of gold - (real cost of production and amount of gold used for non-monetary purpose),
 - (iii) the net of import and export of gold. If the monetary gold stock is more, the central bank can issue more currency notes.
 - b. **Reserve Assets:** The central bank's reserve holdings have an impact on the money supply as well. The central bank's holdings include securities, government bonds, foreign currency reserves, and other items. The money supply would change if any one of these went up or down. For instance, a positive balance of payments will result in a rise in the flow of foreign exchange and an expansion of the money supply. If there is an unfavorable balance of payments condition, there will be a contraction of money.
 - c. **Credit Outstanding of the Central Bank:** The money supply can be managed by the central bank by altering the loans it makes and the investments it makes. Bonds and other government securities are purchased by central banks. The money supply will be impacted by the sale and acquisition of these securities. The central bank increases the amount of money in circulation whenever it makes a purchase of assets by paying for them. The money supply is decreased when the central bank sells assets because money moves from the general public to the central bank. The central bank influences the amount of money in circulation by modifying its investments and the loans it approves.

2. **Extent of Monetization:** The degree of monetization affects the money supply as well. The use of money as a means of exchange is known as monetization. Items are traded for other items in a barter exchange. The process of transforming a barter economy into a money economy is known as monetization. Developed nations are completely monetized. Even now, there are unmonetized sectors in underdeveloped nations. The level of monetization determines the money supply. A monetized economy would have a larger money supply than a non-monetized one. One measure of the monetary economy is the degree of monetization. The amount of money in circulation and the degree of commercialization are directly correlated.
3. **Community's Choice:** The money supply is greatly influenced by the payment method that the society chooses. The money supply would be smaller if the society chose to pay with cash as the transaction would end then and then. In contrast, banks will be able to extend credit and increase the amount of money in the economy if payments are made with checks. A commercial bank uses the remaining funds to create credit after holding onto a specific percentage of deposits as reserve money. Conversely, a lower cash reserve ratio will result in higher credit creation and, thus, a larger money supply. The majority of payments in industrialized nations are made with checks. Hence, there is more credit creation and more money supply. In the case of less developed countries, people prefer to make payments by cash rather than by cheque. Hence, money supply is less. The choice of the community also depends upon the banking habits of the people, development of the banking system, income level, etc.
4. **Cash Reserve Ratio:** It has a significant influence on bank funds. The central bank fixes it statutorily. It is the proportion of a bank's total deposit liabilities to its cash assets. The cash ratio, the quantity of deposits, and a number of other variables determine a commercial bank's ability to provide credit. One crucial factor in determining the establishment of credit is the cash reserve ratio. The cash reserve ratio and credit creation are inversely correlated. A high ratio means that commercial banks will need to set aside more money as reserves, which will reduce their available loans. Banks will be able to extend more credit if the ratio is lower since there would be more money available. The central bank uses this ratio to regulate the credit created by commercial banks and thereby total money supply in the economy.
5. **Budgetary Policy of the Government:** The Budgetary policy of the government deals with public revenue, public expenditure and public debt. All these have an impact on money supply. The effects of budgetary policy on money supply are as follows:
 - a. One of the important sources of revenue for the government is taxation. When more taxes are levied, money flows from the public to the government. Hence money supply will be less. On the contrary when taxes are reduced money supply will be more.

- b. Public Expenditure refers to the expenditure incurred by the government. In the recent times expenditure incurred by modern governments has increased considerably due to a no. of factors. This has resulted in more money supply.
- c. The budgetary policy of the government can be a surplus one or deficit one. If it is surplus budget, then it implies that the revenue of the governments more than its expenditure. Hence there will be contraction of money supply. On the other hand if it is a deficit budget, then expenditure will be more than revenue leading to an expansion in money supply.
- d. When the expenditure of the government is more than its revenue, then it resorts to borrowing which is known as public debt. When the government borrows from the public there will be reduction in money supply and when it repays there will be expansion of money supply.
- e. Modern governments incur huge expenditure. When revenue is not sufficient to meet the expenditure, they resort to deficit financing. Deficit financing refers to the borrowings of the government from the central bank. Deficit financing leads to an increase in monetary base there by increase in money supply.

7.3 VELOCITY OF CIRCULATION OF MONEY

The quantity of money that moves through the economy in a specific amount of time is known as the velocity of circulation. The calculation of velocity of circulation involves dividing the GDP by the entire money supply of the nation. A nation's high circulation velocity is a sign of high inflation.

Symbolically it is represented as "V". Suppose the total number of notes in circulation is Rs 4000 crores. If on an average the note is spent 10 times then the total value of transactions is equal to $4000 \times 10 = \text{Rs. } 40,000$ crores. Thus the supply of money over a period of time can be easily estimated. If the quantity of money in circulation is represented as "M" and velocity of circulation of money as "V",

then the total supply of money is $M \times V = MV$.

The velocity of circulation of money is influenced by a variety of factors.

They are as follows:

7.3.1 Factors Influencing Velocity of Circulation of Money:

- (1) **Regularity of Income:** When income is steady and consistent, there will be a large circulation of money. Spending increases when one's income is steady and consistent. Velocity will therefore be high. On the other side, people will feel less confidence to spend and would

prefer to save more if their income is inconsistent and uncertain. Low money circulation velocity will arise from this.

- (2) **Time Between Income Receipts:** People receive money on a daily, weekly, or monthly basis. The velocity of money circulation will be larger the shorter the interval between two pay days. This is a result of the reduced requirement to maintain cash holdings. If there is a longer period of time between two days, people tend to hold more liquidity. Low money circulation velocity will result from this.
- (3) **Payment Methods:** The payment method has an impact on velocity as well. If payments are paid all at once, the transaction will end right once, which will reduce velocity. On the other hand, there will be a high velocity if payments are made in installments.
- (4) **People's Preference for Liquidity:** People's preference for carrying liquid cash with them is known as their liquidity preference. People who have a strong desire for liquidity will keep larger cash holdings, spend less, and so have lower velocity. There will be more velocity if there is less preference for liquidity. As a result, the velocity of money circulation and liquidity preference are inversely correlated.
- (5) **Income Distribution:** The national income distribution has an impact on velocity as well. In every society, the wealthy often save more than the underprivileged. So, there will be less velocity in their situation. When they get money, the impoverished usually spend it right away. Velocity will therefore be high.
- (6) **Growth of Banks and Financial Institutions:** In economies with well-developed banking and financial sectors, there will be a greater volume of business transactions. These sectors offer a wealth of opportunities for investment and credit for business transactions. In less developed nations, on the other hand, there will be fewer transactions and a lower velocity of circulation of bank money, which will result in a higher velocity of circulation of coins and currency notes.
- (7) **Business Conditions:** Factors such as booms, depressions, and the like impact the speed at which money circulates. There will be more transactions and an upbeat attitude toward the state of business during a boom. This will cause the velocity to be high. Conversely, during a depression, corporate pessimism will rule, resulting in subpar transactions and a low velocity of money circulation. As a result, during a boom, velocity will be high, and during a downturn, lower.
- (8) **Speed of Money Transactions:** The money supply is also influenced by the speed of money transactions. The banking industry can quickly deliver a variety of services if it is technologically sophisticated and effective. Cash remittance, check clearance, and other processes will go swiftly. Transaction volume would be higher in such a scenario, which would result in a high money circulation velocity. In the absence of such an effective mechanism, velocity will be low.

7.4 QUESTIONS

1. Explain the meaning and constituents of money supply.
2. Discuss RBI's approach to measurement of money supply.
3. What are the determinants of money supply?
4. Explain the meaning of velocity of circulation of money and factors affecting it.

DEMAND FOR MONEY

Unit Structure:

- 8.0 Objective
- 8.1 The Quantity Theory of Money
- 8.2 Keynes' Liquidity Preference Theory of Interest
- 8.3 Portfolio Theories of Money Demand
- 8.4 Friedman's Theory of Demand for Money
- 8.5 Questions

8.0 OBJECTIVES

- To know the various approaches to demand for money
 - To understand the Keynesian liquidity preference theory
 - To understand various approaches based on functions of money
-

8.1 THE QUANTITY THEORY OF MONEY

The quantity theory of money was used by economists to explain changes in general price level. They believed that the quantity of money in the economy was the prime factor determining price level. Any change in the quantity of money would bring about a change in the general price level. The theory is based directly on the changes brought about by an increase in the money supply. The quantity theory of money states that the value of money is based on the amount of money in the economy.

8.1.1 Classical Cash Transactions Approach

(A) Fisher's Equation of Exchange

Since, the classical theory of money assumes that money is held by people for transaction purposes only, the approach is referred to as the Cash transactions Approach to the theory of money and price level. The most significant version of the quantity theory is the version developed by Irving Fisher. Fisher developed his version of the quantity theory of money in his book *Purchasing Power of Money*, published in 1911. Fisher suggested that there is a mechanical and fixed proportional relationship between changes in the money supply and the general price level.

According to Fisher's version of the theory :

The general price level (P) is influenced by the following factors

- (1) The quantity of money in circulation (M) ;
- (ii) The volume of transaction in the economy (T), and

The above mentioned relationships have been represented by the following equation, widely known as the **Fisher's equation of exchange**:

$$MV = PT \quad \dots(1)$$

The components of the equation can be explained as follows:

- (a) **T** depends upon the amount of goods and services produced and supplied in the economy. Larger the volume of goods and services supplied, the higher will be the value of **T**. Classical economists assumed that there is full employment prevailing in an economy and hence, the total volume of transaction **T** remains constant.
- (b) The quantity of money **M** is determined by the monetary authorities and the banking system. Banks create money through the process of multiple credit creation. This depends on their deposit base.
- (c) **V**, velocity of circulation of money is the number of times a unit of money changes hands to facilitate transactions in goods and services.

V is assumed to be constant.

From equation (1), we can derive the following :

$$P = MV / T \quad \dots (2)$$

The above equation implies that, **V** and **T** remaining constant, **P** changes proportionately to a change in **M**. That is, if money supply **M** is doubled, the price level **P** will also double.

In order to incorporate bank money in the theory, Fisher gave the following equation:

$$MV + M'V' = PT \quad \dots (3)$$

Where, **M'** are total deposits subject to transfer by cheques

V' average velocity of circulation of bank money

Numerical Example

The direct proportional relationship between the quantity of money **M** and price level **P** can be understood with the help of the following example:

Suppose the quantity of money (**M**) is ₹ 50,000 in an economy, the velocity of circulation of money (**V**) is 4 and the total output to be transacted (**T**) is 20,000 units, the average price level (**P**) will be:

$$\begin{aligned} P &= MV/T \\ &= 50,000 \times 4 / 20,000 = 2,00,000 / 20,000 \\ &= ₹10 \end{aligned}$$

Other things remaining the same, the quantity of money is doubled, that is, increased to ₹ 1,00,000, then P will be

$$\begin{aligned} P &= MV/T \\ &= 10,0000 \times 4/20,000 \\ &= ₹ 20 \end{aligned}$$

As M is doubled, price level is also doubled.

Assumptions:

From the above explanations, we can enumerate the assumptions on which Fisher's theory is based:

1. P or general price level is the dependent variable and is passive. It is affected by the other factors in the equation.
2. T remains constant and is independent of other factors.
The supply of money M is exogenously (outside the theory) determined by the monetary authorities. M' is determined by the banking system.
4. The proportion of M' to M remains constant.
5. Both V and V' are assumed to be constant and they are independent of M and M'.
6. There is full employment in the economy.
7. The theory is applicable in the long run.
8. Demand for money arises from 'medium of exchange' function of money

The theory states: The price level rises proportionately with a given increase in the quantity of money. Conversely, the price level falls proportionately with a given decrease in the quantity of money, other things remaining the same. Any change in M will bring about a direct proportionate change in P.

8.1.2 Neoclassical Cash Balances Approach

(A) Cambridge Equations

The Cambridge version of quantity theory of money was first developed by Alfred Marshall and later modified by A.C. Pigou and D.H. Robertson. Since all these economists were from the Cambridge University, their version of the quantity theory came to be known as the Cambridge Version. This version is an improvement over the classical cash transactions approach.

According to the Cambridge version, people demand to hold money not only for transactions but also because of money's function as a 'store of value'. Therefore, real demand for money is for transaction as well as for other purposes. When money is held or hoarded, it has utility as it acquires wealth value. The amount of cash balances held by people is determined by

their real value, or the purchasing power of the balances held. People will want to hold money not for money's sake but for the command that money has over real resources and goods.

Taken together, the community's total demand for cash balances constitutes a certain proportion of the country's real national income. This proportion is represented by the letter 'k' in the Cambridge equation. It represents a proportion or percentage of the total real income (output produced) that people of a country demand to hold in the form of cash balances.

If we assume that in an economy, the volume of transactions are given over a period of time, then the community's total demand for real cash balances may be represented by a certain proportion (k) of the annual real national income (Y).

The proportion k, known as 'Cambridge k', is determined by individuals and groups of individuals on the basis of several factors like spending pattern, price level rate of interest, general economic condition, the opportunity cost of holding cash. When people want to hold more cash, they spend less on goods and services. This lowers the demand for goods and services and price level falls. Similarly, if people want to hold less cash and spend more on transacting in goods and services, the price level will rise. Price level determines the value of money. Higher the price level, lower will be the purchasing power of one unit of money, and vice versa.

The Cambridge version is represented by the following equation:

$$M_d = kPY \quad \dots (1)$$

Where,

M_d = community's demand for money

Y = real national output

P = average price (general price level)

k = proportion of national output or income that people want to hold

Let us assume that money supply M_s is determined by monetary authorities.

$$M_s = M \quad \dots (2)$$

At full employment equilibrium, supply of money is equal to demand for money.

$$M_s = M_d \quad \dots (3)$$

or

$$M = kPY \quad \dots (4)$$

$$P = M/kY \quad \dots (5)$$

Where,

k and Y are independent of money supply

k is constant and is given by transaction demand for money Y is constant at full employment

F and money supply M are directly proportional. If money supply is doubled, so will F and if money supply is halved, F will also be halved.

(B) Keynesian Approach

The two key pillars of the liquidity preference approach to the demand for money are the medium of exchange (i) and the store of value (ii). **Before** Keynes, economists analyzed the theory of demand for money without properly considering these functions. In his well-known work "The general theory of employment interest and money," Lord J.M. Keynes clarified why people need money by focusing more on its "store of value" qualities while also acknowledging its function as a "medium of exchange." Keynes believed that people's fear and uncertainty about the future were the reasons behind their preference for liquidity or their desire to hold money in the form of cash. One "barometer of the degree of our distrust of our own calculations and conventions of the future" is the urge to hold money. We become tense and uneasy when we have fear and uncertainty about the future. Having money gives us confidence and calms our anxiety. In addition to giving us bravery and confidence, money serves as a store of value and a medium of exchange, which combined provide the justifications for why money is maintained. Keynes identifies three reasons to keep money on hand, and they are:

Motives for Holding Money

1. **The Transactions Motive** :People need money to conduct daily transactions, yet the majority of them do not have a regular source of income. Although it is often received once a month, there are situations in which it may be received once a week or even daily. For those who receive a daily pay, there is a lag between consecutive income receipts but not between the expenses incurred from different transactions. The transaction's purpose is further divided into

1) Income motive and ii) Business motive

Income motive:

It refers to the transactions demand for money by the wage and salary earners. They receive their income once in a month or in few case weekly or daily. Money is required for these people to carry out transactions of all kinds. They may include regular payments like rent, electricity and grocery bills and all other payments. Suppose the time interval between two income receipts is a month, people require to hold money with them to meet their daily payments. Money held for this purpose declines over the income interval period, at the end of the period the balance being zero.

Business Motive:

Business firms require to hold money to meet their day-to-day transactions.

The income interval of the firms may be a month or two or even longer; as there is always a time gap between production and realisation of its value.

Meanwhile they require to keep money for payments of various bills such as electricity, rent, raw-material, wages etc. As in the case of individuals, the money held at the beginning of income interval period is high and declines over the period.

The Precautionary Motive:

The Keynesian precautionary theory places a significant emphasis on uncertainty, holding aside a certain amount of money "for contingencies requiring sudden expenditure and for unforeseen opportunities of advantageous purchase" in addition to the known requirements. People save money in case of unplanned crises, accidents, or other unforeseen increases in expenses. Demand for precautionary motive; like the transaction motive, also depends on the level of income. The amount of money kept for this motive varies directly with income. Rich people will have a larger amount for this motive as against the poor who may have hardly any balance for this purpose. Similarly business firms demand for money depends on their turnover. Here also the smaller firms will have a lesser amount. A firm's precautionary demand for money is influenced by political uncertainties too, when political conditions are unstable, firms tend to become more cautious and hold a larger amount of cash. The transactions and precautionary demand for money is a function of level of income.

Both transaction and precautionary demand for money are based on the role of money as medium of payment and both are primarily influenced by the level of income. Keynes clubbed them together. The combined demand for transactions and precautionary motive is expressed as

$$L_1 = f(y).$$

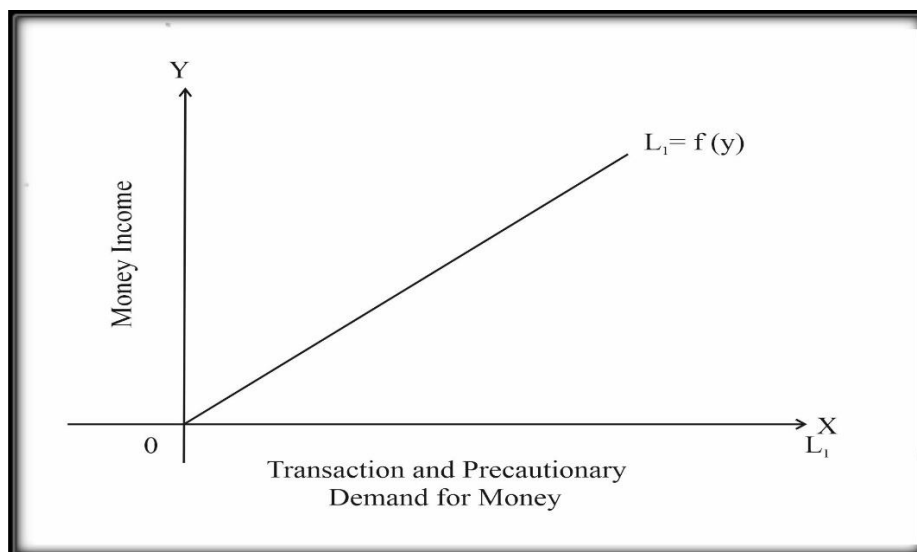


Figure 8.1

Fig. 8.1 explains the relationship between demand for money (L_1) and income (Y). The demand for money for these motives is not influenced by rate of interest except perhaps at a very high rate. It is not unlikely that people may decide to reduce their cash balances in order to earn some

additional income offered by attractive interest rate. In general, however the demand for money for transactions and precautionary motives is interest inelastic as shown in Fig. 8.2.

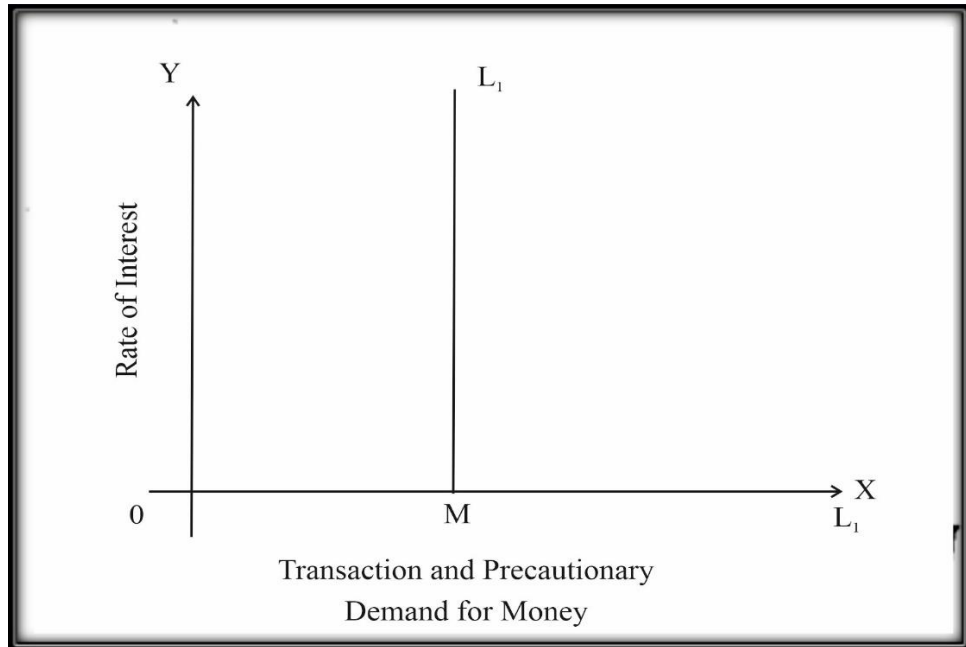


Figure 8.2

In Fig. 8.2 the vertical line ML_1 indicates that the transaction and precautionary demand for money. It is unaffected by the changes in the rate of interest i.e. demand for money (L_1) is interest inelastic.

Demand for money held under transaction and precautionary motives is known as demand for "active cash balances". It depends on level of income. We may state this demand as

$$L_1 = f(y).$$

where L_1 = Demand for money for transactions and precautionary motive

Y = Income

The equation tells us that L_y is the function (f) of income (Y).

The Speculative Motive:

The "store of value" function of money is linked to the need for money for speculative purposes. Unlike the previous motivations—transactions and precautionary—where money is maintained to serve as a medium of exchange, the speculative reason is different. The "asset demand for money" is another term for the speculative desire.

Individuals can choose to hold cash or invest in financial assets such as stocks or government bonds. Uncertainty is also linked to speculative demand. The uncertain capital value of financial assets is the focus of the uncertainty aspect. By acquiring financial assets at a discount and selling

them when their values increase, people hope to profit. Individuals engage in conjecture based on their personal computations.

Bonds and securities held by those who anticipate a decline in prices and those who do not anticipate any more price increases are sold. Money is in demand speculatively and is elastic to interest. Less money is held for this purpose at higher interest rates, and vice versa. Such an adverse link makes sense for two key reasons. First, there is a higher opportunity cost associated with storing cash when interest rates are high. Second, the interest rate and securities prices have an inverse connection. Let us take the long-term government securities bearing fixed rate of interest. Though the return on government securities remain fixed, the rate of interest in the market does not remain constant. As the interest in the market increases people prefer to invest in the market instead of in low yielding government securities. However if government securities are offered by those who need cash, they will be purchased at a lower price. Suppose a ₹ 100 government security brings a fixed return of 10 percent, the market rate of interest at the same time goes up to 15 percent, then the price of the security in the market would be ₹ 66.66. It is because ₹ 66.66 will earn ₹10 at 15% interest that prevails in the market. Similarly when the market rate of interest declines the security prices rise. In our example if the market interest declines to 8% then the security price would be ₹125. The changes in market rate of interest and security price can be expressed in the form of an equation.

The market rate of interest and the market price of the securities have an inverse connection, as the explanation above makes abundantly evident. Therefore, when interest rates are high, people do not carry cash. Due to the fact that (i) keeping cash has a high opportunity cost and (i) investors are encouraged to buy securities at such time because of their low price. Buying now and selling them when the market rate of interest drops and drives up the price of securities is beneficial. On the other hand, people prefer to store cash when the market rate of interest is low since it presents a very cheap opportunity cost and is an ideal moment to sell securities due to their high values.

Besides the above reasons, expectations regarding the market rate of interest and security prices also play an important role in determining the speculative demand for money.

Demand for Money (Liquidity Preference) for Speculation Motive

Fig.8.3 explain demand for money for speculative motive, which we term as LP. It is measured on X-axis and rate of interest on Y-axis. At interest I , only OM quantity is demanded. At a lower interest, that is r' and r'' , ON, and OM, quantity is demanded. From point T demand for LP becomes perfectly elastic which is called as 'Liquidity Trap'.

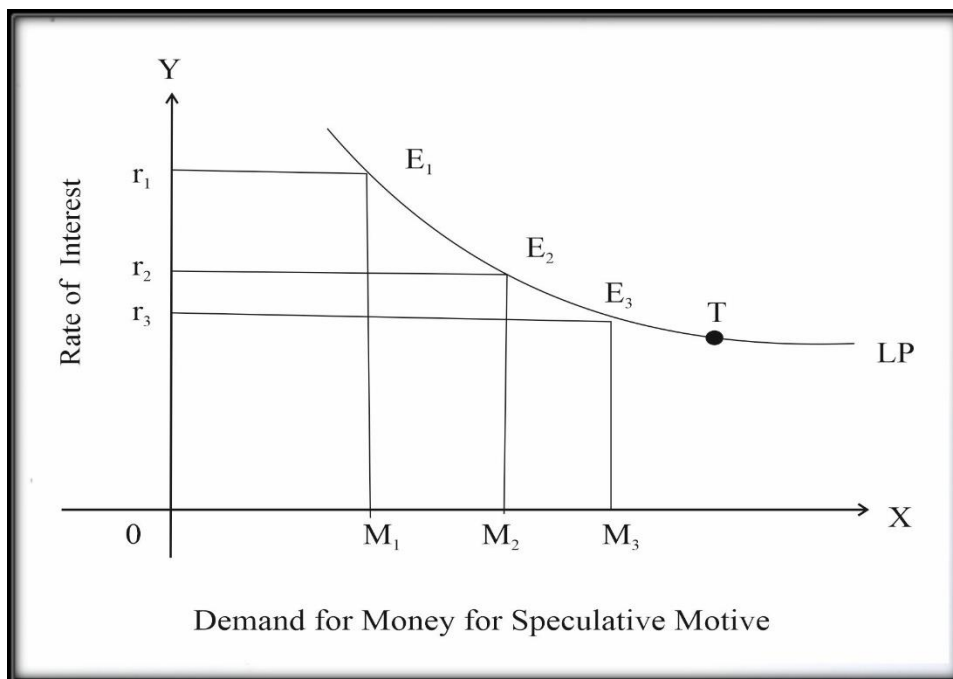


Figure 8.3

Demand for money held under the speculative motive is referred to as the demand for "idle cash balances".

Demand for speculative motive (L_2) depends on the rate of interest (r).

$$L_2 = f(r)$$

L = Demand for speculative motive

r = Rate of interest

L , and r are inversely related.

Liquidity Trap:

The inverse relationship between the rate of interest and speculative demand for money transforms into a different form of relationship at a very low rate of interest. Keynes suggested that at a very low rate of interest the speculative demand for money becomes perfectly elastic. Keynes considered a 2 percent rate of interest as lowest rate, below which the market rate of interest would not decline. At such a low rate of interest people prefer cash and not the securities. At this point, when the expectation about the future fall in the security prices is high and widespread, every one prefers to hold cash to gain from the future market situation. At point T the L , curve becomes horizontal. The horizontal part of the L , curve shows the **liquidity trap** which explains the perfectly elastic demand for money for speculative motive. People prefer to hold cash instead of bonds due to the fear of an imminent decline in their prices. Any attempt by monetary authorities at this point to increase money supply would not affect the rate of interest since it has already dropped to its lowest level.

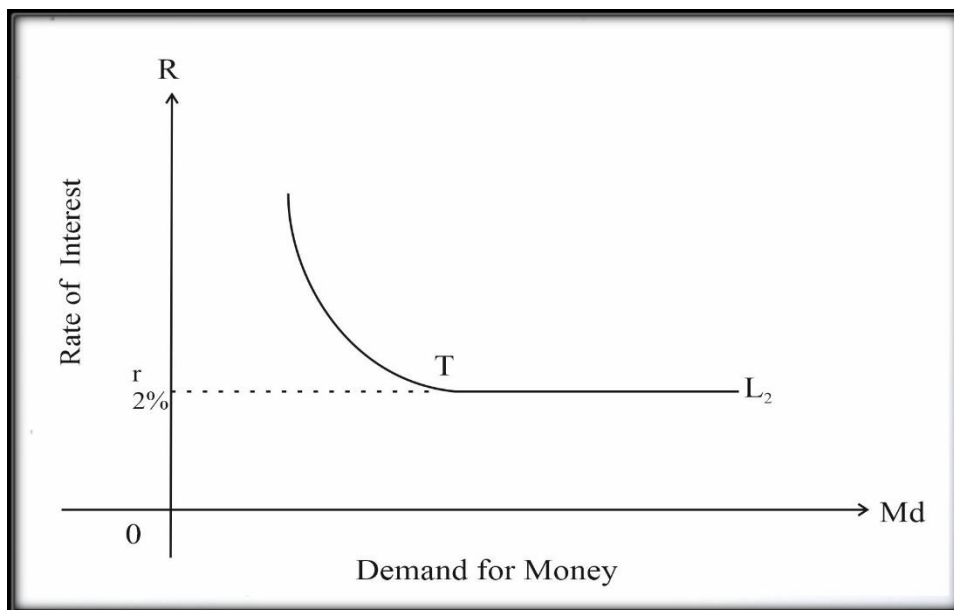


Figure 8.4

Total Demand for Money :

The aggregate demand for money arises out of three motives-transaction, precautionary and speculative. Demand for the first two motives is mainly income determined and interest inelastic. The speculative demand for money is interest elastic. The total demand is expressed as

$$M. = L_1(Y) + L_2(r)$$

Where Md = Demand for money.

$L_1(Y)$ = demand for transaction and precautionary motives, both being an increasing function of level of income.

$L_2(r)$ = speculative demand, is a declining function of rate of interest.

In Keynesian terms we can express the total demand for money as

$$Md = L(Yr)$$

The transactions and precautionary demand for money is considered as active balance and is the function of income. It is positively related to the level of income. The speculative demand is a demand for idle balance and is inversely related to the rate of interest.

The total demand for money is explained diagrammatically as follows.

Figure 8.5 (I) shows OM , the transactions and precautionary demand for money at y level of income and different rates of interest. Figure (II) shows the speculative demand for money at various rates of interest. Figure (III) shows the total demand curve for money. It represents liquidity preference of the community at different rates of interest.

8.2 KEYNES' LIQUIDITY PREFERENCE THEORY OF INTEREST

Interest, according to J.M. Keynes is a monetary phenomenon and is determined by demand for and supply of money. It is a price paid for parting with liquidity, accordingly Keynesian theory of interest is also called Liquidity preference theory of interest.

Demand for Money: According to Keynes, demand for money is people's desire to hold cash or their preference for liquidity. Keynes lists three important motives to hold money. They are: (I) Transaction Motive (II) Precautionary Motive and (III) Speculative Motive.

Supply of Money: Supply of money is determined by the monetary authority, that is, the Central bank of the country. It is determined by a number of factors and not necessarily by changes in the rate of interest. At unburn time, money supply is constant, therefore represented by a vertical line.

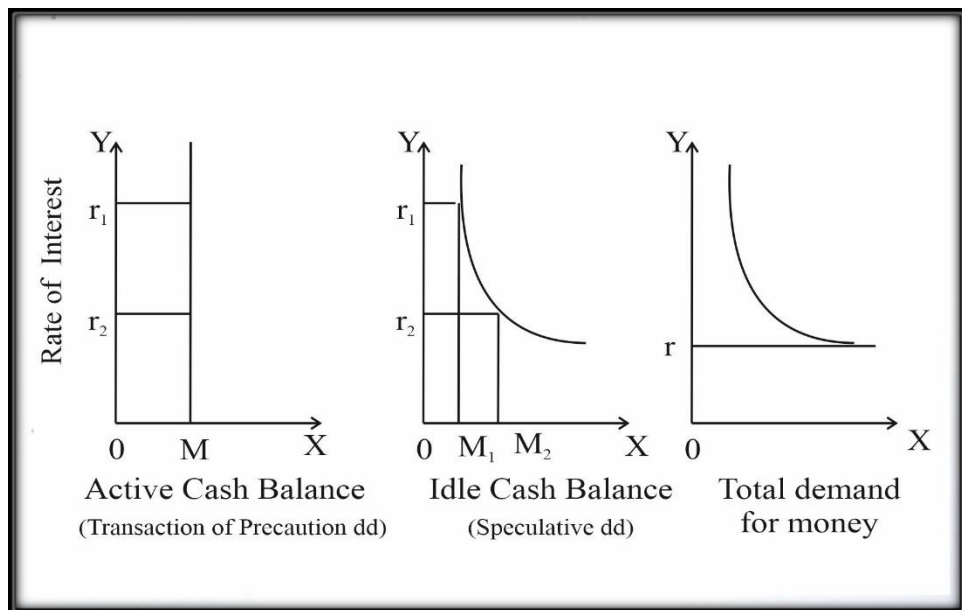


Figure 8.5

In the above diagram,

M_d = Demand for money (Liquidity preference) specially for speculative motive

M_s = Supply of money

Rate of interest, OR, is determined at the point E where demand (M_d) for and supply of money (M_s) intersect.

A change in demand or supply or both will result in a change in rate of interest

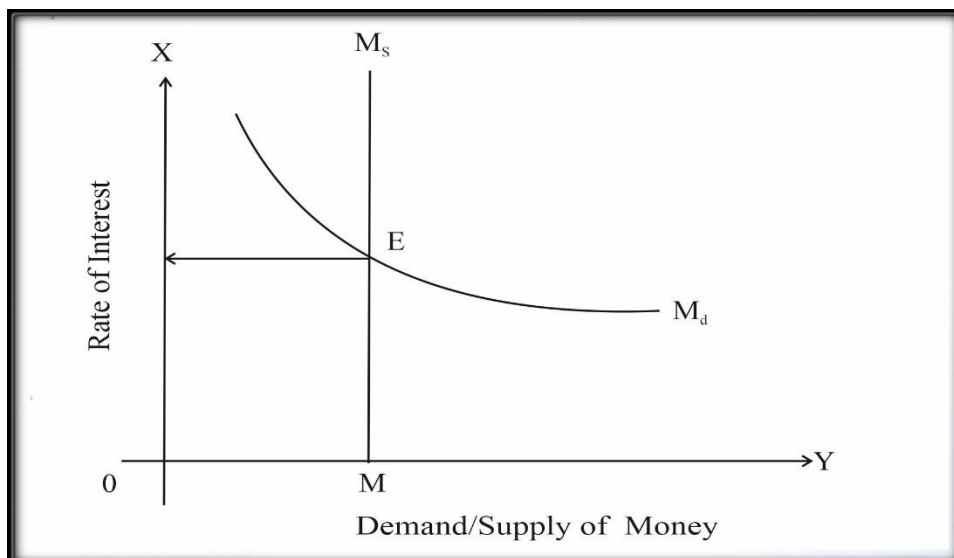


Figure 8.6

8.3 PORTFOLIO THEORIES OF MONEY DEMAND

Portfolio theories of money demand focus on how individuals and institutions decide on the composition of their asset portfolios, including the holding of money, based on factors like risk, return, liquidity, and personal preferences. These theories extend beyond the traditional transaction-based motives for holding money by considering it as one of many assets in a portfolio.

Following are the key Portfolio Theories of Money Demand

1. **Tobin's Portfolio Balance Approach:** Individuals allocate their wealth across different assets, balancing risk and return. Money is included in this portfolio primarily for its liquidity and safety. Money is a safe asset which provides high liquidity but no return. Whereas riskier assets, like stocks and bonds, offer higher returns but come with increased risk.

The degree of risk aversion influences the amount of money held by individuals. More risk-averse individuals will hold more money relative to risky assets. The demand for money is inversely related to interest rates. As interest rates on alternative assets rise, the opportunity cost of holding money increases, leading to a decrease in money demand.

2. **Baumol-Tobin Model** The Baumol-Tobin model fits within the portfolio framework by analysing how people balance transaction costs and interest forgone. Individuals decide on the optimal cash balance that minimizes the total cost of transactions and the opportunity cost of holding money. The model also provides a formula to calculate the optimal cash balance, balancing fixed transaction costs against the interest rate of holding alternative assets.

3. **Friedman's Modern Quantity Theory:** Milton Friedman proposed that money demand is a function of permanent income rather than current income, as people make financial decisions based on expected long-term income. Money is one of several assets in a portfolio, and the demand for money depends on the returns and risks associated with all assets, not just money.

Individuals desire to hold a certain level of real balances (money adjusted for inflation), which is influenced by factors such as wealth, expected inflation, and interest rates. The opportunity cost of holding money is key, as higher returns on alternative assets will reduce money demand.

4. **Liquidity Preference Theory:** Keynesian theory initially outlined three motives—transaction, precautionary, and speculative. The portfolio approach focuses mainly on the speculative motive, where individuals hold money as a safe asset amidst uncertainty. The demand for money is interest elastic, meaning it responds to changes in interest rates, with money holdings decreasing as interest rates rise.

A common theme is that money demand is inversely related to interest rates due to the opportunity cost of holding money when higher returns are available on alternative assets. Individuals and institutions consider risk and uncertainty in their portfolio decisions, affecting their demand for liquid and safe assets like money.

Changes in economic conditions, such as inflation expectations or financial market volatility, can influence the demand for money as individuals adjust their portfolios to manage risk.

(A) Tobin's Portfolio Approach to Demand for Money: James Tobin, an American economist, in his analysis makes a valid assumption that people prefer more wealth to less. According to him, an investor is faced with a problem of what proportion of his portfolio of financial assets he should keep in form of ready money (which earns no interest) and in form of investment (which earns interest) such as bonds. An individual's portfolio may also consist of more risky assets such as shares. Tobin's Portfolio Approach can be explained as follows:

1. **Portfolio Selection:** According to Tobin individuals hold money as part of a diversified portfolio of assets. This portfolio includes various assets like bonds, stocks, and money, each with different risk and return profiles.
2. **Risk and Return:** The classical view mainly focused on transaction motives for holding money, whereas Tobin emphasized the role of risk and return in portfolio choice. Individuals balance their portfolios based on the expected return and risk associated with each asset.
3. **Risk Aversion:** Tobin introduced the concept of risk aversion in deciding the composition of an individual's portfolio. Money is typically risk-free or absolutely safe but offers no return. So money is

held as a hedge against the uncertainties associated with other, riskier assets.

4. **Liquidity preference:** Tobin derived his liquidity preference function showing relationship between rate of interest and demand for money. He argues that with the increase in the rate of return on bonds, individuals will be attracted to hold a greater proportion of their wealth in bonds and less in form of ready money.

At a higher rate of interest, the demand for holding money will be less and people will hold more bonds in their portfolio and vice versa.

The downward sloping liquidity preference function curve shows that the asset demand for money in the portfolio increases as the rate of interest on bonds falls. In this way Tobin derives the aggregate liquidity preference curve by determining the effects of changes in the interest rate on the asset demand for money in the portfolio of peoples.

(B) The Baumol-Tobin model: The Baumol-Tobin model, developed independently by William Baumol and James Tobin, is a theoretical framework that explains the demand for money, particularly focusing on the transaction demand. It offers insights into how individuals and firms manage their cash balances in the light of transaction costs and interest rates. The model can be explained as follows:

1. **Transaction Demand for Money:** The Baumol-Tobin model addresses how individuals and businesses hold money to facilitate transactions, balancing the trade-off between holding cash (which earns no interest) and holding interest-bearing assets.
2. **Cash Management Problem:** The model treats money management as an optimization problem where individuals decide how much money to hold for transactions and how often to convert interest-bearing assets into cash.
3. **Trade-off:** There is a trade-off between the liquidity of holding cash and the opportunity cost of holding interest-bearing assets. Holding more cash reduces the frequency and cost of converting assets but increases the opportunity cost due to forgone interest.

Mathematical Formulation

The model can be expressed mathematically to find the optimal cash balance (C^*):

Total Costs (TC): The total cost of holding money is the sum of transaction costs and opportunity costs. It can be represented as:

$$TC = \frac{T}{C}F + \frac{C}{2}r$$

where:

- T is the total transaction amount over a period.
- C is the cash balance held.
- F is the fixed transaction cost per conversion.
- r is the interest rate on alternative assets.

Optimal Cash Balance (C^*): By minimizing the total cost function, the optimal cash balance is given by:

$$C^* = \sqrt{\frac{2TF}{r}}$$

This formula shows that the optimal cash balance is positively related to the total transaction amount and fixed transaction costs, and inversely related to the interest rate.

Conclusion

The Baumol-Tobin model provides a framework for understanding the transaction demand for money by highlighting the trade-offs between transaction costs and opportunity costs. It explains how individuals and businesses manage their cash holdings in response to changes in transaction costs and interest rates, and it remains a foundational concept in monetary economics.

8.4 FRIEDMAN'S THEORY OF DEMAND FOR MONEY

According to Friedman, the money demand function is the most significant and reliable macroeconomic function. He views money as one kind of asset that wealthy people can retain some of their riches in. In the eyes of business organizations, money is a capital good or a factor of production that they use in conjunction with labor or other productive assets to create goods and services.

In light of this, Friedman claims that people hold money in exchange for the services it offers. It should be mentioned that money provides a broad purchasing power that makes it easy to employ for the purchase of products and services. Friedman views the need for money as nothing more than an application of the general idea of capital asset demand. Like other capital assets, money also yields return and provides services. He analyses the various factors that determine the demand for money and from this analysis derives demand for money function. Note that the value of goods and services which money can buy represents the real yield on money. Obviously, this real yield of money in terms of goods and services which it can purchase will depend on the price level of goods and services.

Besides money, bonds are another type of asset in which people can hold their wealth. Bonds are securities which yield a stream of interest income, fixed in nominal terms. Yield on bond is the coupon rate of interest and also

anticipated capital gain or loss due to expected changes in the market rate of interest.

Equities or Shares are another form of asset in which wealth can be held. The yield from equity is determined by the dividend rate, expected capital gain or loss and expected changes in the price level. The fourth form in which people can hold their wealth is the stock of producer and durable consumer commodities.

These commodities also yield a stream of income but in kind rather than in money. Thus, the basic yield from commodities is implicit one. However, Friedman also considers an explicit yield from commodities in the form of expected rate of change in their price per unit of time.

Friedman's nominal demand function (M_d) for money can be written as

$$M_d = f(W, h, r_m, r_b, r_e, P, \Delta P/P, U)$$

As demand for real money balances is nominal demand for money divided by the price level, demand for real money balances can be written as

$$M_d/P = f(W, h, r_m, r_b, r_e, P, \Delta P/P, U)$$

Where M_d stands for nominal demand for money and M_d/P for demand for real money balances, W stands for wealth of the individuals, h for the proportion of human wealth to the total wealth held by the individuals, r_m for rate of return or interest on money, r_b for rate of interest on bonds, r_e for rate of return on equities, P for the price level, $\Delta P/P$ for the change in price level {i.e. rate of inflation), and U for the institutional factors.

- 1. Wealth (W):** The major factor determining the demand for money is the wealth of the individual (W) In wealth Friedman includes not only non-human wealth such as bonds, shares, money which yield various rates of return but also human wealth or human capital. By human wealth Friedman means the value of an individual's present and future earnings.

Whereas non-human wealth can be easily converted into money, that is, can be made liquid. Such substitution of human wealth is not easily possible. Thus human wealth represents illiquid component of wealth and, therefore, the proportion of human wealth to the non-human wealth has been included in the demand for money function as an independent variable.

Individual's demand for money directly depends on his total wealth. Indeed, the total wealth of an individual represents an upper limit of holding money by an individual and is similar to the budget constraint of the consumer in the theory of demand.

The greater the wealth of an individual, the more money he will demand for transactions and other purposes. As a country, becomes richer, its demand for money for transaction and other purposes will increase.

Since as compared to non-human wealth, human wealth is much less liquid, Friedman has argued that as the proportion of human wealth in the total wealth increases, there will be a greater demand for money to make up for the illiquidity of human wealth.

2. **Rates of Interest or Return (r_m , r_b , r_e):** Friedman considers three rates of interest, namely, r_b , r_e and which determine the demand for money, r_m is the own rate of interest on money. Note that money kept in the form of currency and demand deposits does not earn any interest.

But money held as saving deposits and fixed deposits earns certain rates of interest and it is this rate of interest which is designated by r_m in the money demand function. Given the other rates of interest or return, the higher the own rate of interest, the greater the demand for money.

In deciding how large a part of his wealth to hold in the form of money the individual will compare the rate of interest on money with rates of interest (or return) on bonds and other assets. As mentioned earlier, the opportunity cost of holding money is the interest or return given up by not holding these other forms of assets.

As rates of return on bond (r_b) and equities (r_e) rise, the opportunity cost of holding money will increase which will reduce the demand for money holdings. Thus, the demand for money is negatively related to the rate of interest (or return) on bonds, equities and other such non-money assets.

3. **Price Level (P):** Price level also determines the demand for money balances. A higher price level means people will require a larger nominal money balance in order to do the same amount of transactions, that is, to purchase the same amount of goods and services.

If income (Y) is used as proxy for wealth (W) which, as stated above, is the most important determinant of demand for money, then nominal income is given by $Y.P$ which becomes a crucial determinant of demand for money.

Here Y stands for real income (i.e. in terms of goods and services) and P for price level. As the price level goes up, the demand for money will rise and, on the other hand, if price level falls, the demand for money will decline. As a matter of fact, people adjust the nominal money balances (M) to achieve their desired level of real money balances (M/P).

4. **The Expected Rate of Inflation ($\Delta P/P$):** If people expect a higher rate of inflation, they will reduce their demand for money holdings. This is because inflation reduces the value of their money balances in terms of its power to purchase goods and services.

If the rate of inflation exceeds the nominal rate of interest, there will be negative rate of return on money. Therefore, when people expect a higher rate of inflation they will tend to convert their money holdings into goods or other assets which are not affected by inflation.

On the other hand, if people expect a fall in the price level, their demand for money holdings will increase.

5. **Institutional Factors (U):** Institutional factors such as mode of wage payments and bill payments also affect the demand for money. Several other factors which influence the overall economic environment affect the demand for money. For example, if recession or war is anticipated, the demand for money balances will increase.

Besides, instability in capital markets, which erodes the confidence of the people in making profits from investment in bonds and equity shares will also raise the demand for money. Even political instability in the country influences the demand for money. To account for these institutional factors Friedman includes the variable U in his demand for money function.

Simplifying Friedman's Demand for Money Function:

A major problem faced in using Friedman's demand for money function has been that due to the non-existence of reliable data about the value of wealth (W), it is difficult to estimate the demand for money. To overcome this difficulty Friedman suggested that since the present value of wealth or $W = Y_p/r$ (where Y_p is the permanent income and r is the rate of interest on money.), permanent income Y_p can be used as a proxy variable for wealth.

8.5 QUESTIONS

1. Explain Classical Approach to demand for money.
2. Discuss Cambridge Approach to demand for money.
3. Explain Keynesian Approach to demand for money.
4. Explain Keynesian Liquidity Preference Theory of Interest.
5. Discuss Portfolio theories of demand for money.
6. Write a note on Friedman's Theory of demand for money.
