MACRO ECONOMICS - I

ECO2B02

CORE COURSE FOR BA ECONOMICS

II SEMESTER

CBCSS

(2019 Admission)

UNIVERSITY OF CALICUT

SCHOOL OF DISTANCE EDUCATION

Calicut University (P.O), Malappuram, Kerala, India 673635

19352
UNIVERSITY OF CALICUT

SCHOOL OF DISTANCE EDUCATION

STUDY MATERIAL

II SEMESTER

CORE COURSE FOR BA ECONOMICS

ECO2B02 : MACRO ECONOMICS - I

Prepared by:

1. Mr. Ajesh Babu K.P.
2. Dr. Shiji O,

Assistant Professors on Contract,

SDE, University of Calicut.

Scrutinized by:

Dr. Zabeena Hammed P,

Assistant Professor of Economics,

Dr. John Matthai Centre.
### CONTENTS

<table>
<thead>
<tr>
<th></th>
<th>MODULE</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MODULE I</td>
<td>INTRODUCTION TO MACRO ECONOMICS</td>
</tr>
<tr>
<td>2</td>
<td>MODULE II</td>
<td>CLASSICAL MACRO ECONOMICS</td>
</tr>
<tr>
<td>3</td>
<td>MODULE III</td>
<td>KEYNESIAN MACRO ECONOMICS</td>
</tr>
<tr>
<td>4</td>
<td>MODULE IV</td>
<td>MONEY</td>
</tr>
</tbody>
</table>
SYLLABUS

Module I: Introduction to Macroeconomics

Nature, scope and limitations of macroeconomics – Macroeconomic model – Types of variables: Stock and flow, endogenous and exogenous, ex-ante and ex-post – static, comparative static and dynamic – equilibrium and disequilibrium - Circular flow of income and output- national income and its measurement-Production approach, Expenditure approach, Income approach--Real and Nominal GDP.

Module II: Classical macroeconomics


Module III: Keynesian macroeconomics


Module IV: Money

Module I: Introduction to Macroeconomics

Nature, Scope and Limitations of Macroeconomics

Economics is the study of how people choose to allocate their scarce resources to meet their unlimited wants and involves the application of certain principles like scarcity, choice, and rational self-interest, in a consistent manner. The study of economics is usually divided into two separate branches, namely Micro Economics and Macro Economics. In this course, you will study the concepts of Macro Economics. Macro economics is the branch of economics which deals with economic aggregates. It makes a study of the economic system in general. It is the study of the entire economy in terms of the total amount of goods and services produced, total income earned, the level of employment of productive resources, and the general behavior of prices. Macro Economics perceives the overall dimensions of economic affairs of a country. It looks at the total size, shape and functioning of the economy as a whole, rather than working of articulation or dimension of the individual parts. To use Marshall’s metaphorical language, Macro Economics views the forest as a whole, independently of the individual tress composing it. Macro Economics is, in fact, a study of very large, economy- wide aggregate variables like national income, total savings, total consumption, total investment, money supply, general price level, unemployment, economic growth rate, economic development, etc.

Macroeconomics can be used to analyze how best to influence policy goals such as economic growth, price stability, full employment and the attainment of a sustainable balance of payments. Until the 1930s most economic analysis concentrated on individual firms and industries. With the Great Depression of the 1930s, however, and the development of the concept of national income and product statistics, the field of macro economics began to expand. Particularly influential were the ideas of John Maynard Keynes, who used the concept of aggregate demand to explain fluctuations in output and unemployment. In 1933 Ragnar Frisch coined the term Macro Economics. The developments in Macro Economics can be studied under three distinct heads:

1. Classical Macro Economics
2. Keynesian Macro Economics
3. Post-Keynesian Macro Economics
Scope of Macro Economics

Macro Economics is the study of the aggregate modes of the economy, with specific focus on problems associated with those modes - the problems of growth, business cycles, unemployment and inflation. The Macro Economic theory is designed to explain how supply and demand in the aggregate interact to concern with these problems:

- Economic growth takes place when both the total output and total income are increasing.
- GNP is the basic measure of economic activity. Gross National Product (GNP) is the value of all final goods and services produced in the economy in a given time period.
- Nominal GNP measures the value of output at the prices prevailing in the period, during which the output is produced, while Real GNP measures the output produced in any one period at the prices of some base year.
- Inflation rate is the percentage rate of increase of the level of prices during a given period.
- Unemployment rate is the fraction of the labour force that cannot find jobs.
- Business cycle is the upward or downward movement of economic activity that occurs around the growth trend. The top of a cycle is called the peak. A very high peak, representing a big jump in output, is called a 'boom'. When the economy starts to fall from that peak, there is a downturn in business activity. If that downturn persists for more than two consecutive quarters of the year, that downturn becomes a recession. A large recession is called a depression. In general, latter is much longer and more severe than a recession. The bottom of a recession or depression is called the trough. When the economy comes out of the trough, economists say it is an upturn. If an upturn lasts two consecutive quarters of the year, it is called an expansion. The output gap measures the gap between actual output and the output the economy could produce at full employment given the existing resources. Full employment output is also called Potential output.
- Okun's rule of thumb determines the relation between the unemployment rate and income. It states that a 1 per cent change in the unemployment rate will cause income in the economy to change in the opposite direction by 2.5 per cent.
- The Phillips curve suggests a trade off between inflation and unemployment. Less unemployment can always be obtained by incurring more inflation or inflation can be
reduced by allowing more unemployment. However, the short and long run tradeoffs between inflation and unemployment are a major concern of policy making.

- The basic tools for analyzing output, price level, inflation and growth are the aggregate supply and demand curves. Aggregate demand is the relationship between spending on goods and services and the level of prices. The aggregate supply curve specifies the relationship between the amount of output firms produce and the price level. Shifts in either aggregate supply or aggregate demand will cause the level of output to change – thus affecting growth – and will also change the price level - thus affecting inflation.

**Limitations**

1. **Fallacy of Composition**
   In Macro economic analysis the “fallacy of composition” is involved, i.e. aggregate economic behaviour is the sum total of the economy of individual activities. But what is true of individuals is not necessarily true to the fiscal entirely. For instance, savings are a private virtue but a public vice. If total savings in the economy increases, they may initiate a depression unless they are invested. Again, if an individual depositor withdraws his money from the bank, there is no risk. But if all depositors simultaneously do this, there will be a run on the banks and the banking system will be affected adversely.

2. **To Regard the Aggregates as Homogenous**
   The main defect in macro analysis is that it regards the aggregates as homogenous without caring about their internal composition and structure. The average wage in a nation is the sum total of wages in all professions, i.e. wages of clerks, typists, teachers, nurses etc. But the volume of aggregate employment depends on the relative structure of wages rather than on the average wage. If, for instance, wages of nurses increase but of typist rises much aggregate employment would increase.

3. **Aggregate Variables may not be Important Necessarily**
   The aggregate variables which form the economic system may not be of much significance. For instance, the national income of a country is the total of all individual income. A hike in national income does not mean that individual incomes have risen. The increase in national income might be the result of the increase in the incomes of a few rich people in the nation.
Thus a rise in the national income of this type has little significance from the point of view of the community.

4. Indiscriminate Use of Macro Economics Misleading
An indiscriminate and uncritical use of macro economics in analysing the complexities of the real world can frequently be misleading. For instance, if the policy measures needed to achieve and maintain full employment in the economy are applied to structural redundancy in individual firms and industries, they become irrelevant. Likewise, measures aimed at controlling general prices cannot be applied with much advantage for controlling prices of individual products.

5. Statistical and Conceptual Difficulties
The measurement of macro economics concepts involves a number of statistical and conceptual complexities. These problems relate to the aggregation of micro economic variables. If individual units are almost similar, aggregation does not present much difficulty. But if micro economic variables relate to dissimilar individual units, their aggregation into one macroeconomic variable may be incorrect and hazardous.

We may conclude that macro economics enriches our knowledge of the functioning of an economy by studying the behaviour of national income, productivity, investment, savings and consumption. Furthermore, it throws much light in solving the problems of redundancy, inflation, economic instability and economic growth. The concept of stock and flow are mainly used in the macro economics or in the theory of income, productivity and employment. Lastly, both the concepts of stock ad flow variables are very significant in modern theories of income, interest rate, business cycles etc.

**Macroeconomic model**

Economic model is a theoretical construct that captures the essential features, characteristics and the relationships between different set of variables of the underlying phenomena. Construction of an appropriate model will help to understand the underlying phenomena in an easy manner. It also helps theory building. But remember model is not a theory in itself. When a model is constructed to represent a macroeconomic phenomenon it is called as a macroeconomic model. The circular flow diagram is a simplified graphical macroeconomic model of an economy. Models can also be constructed with verbal explanations.
and mathematical equations. The explanation of the circular flow diagram is a verbal model of the economy. But frequently, mathematical models are used to represent economic phenomena as it is easy to make further manipulations and computations. Moreover mathematical models have better precision and accuracy in representation. A simple mathematical model is a mathematical equation constructed to represent an economic phenomenon.

Consider the simple model that represents the domestic economy given by the following equation.

\[ Y = C + I + G + (X-M) \]

The model explains that the domestic expenditure of the economy is comprised of consumption, investment, government purchases and net foreign trade. There can be different models to explain the same theoretical relationship between variables. For instance consider the simple econometric models that theorise the relationship between income and consumption.

\[ C = \alpha + \beta.Y \quad \text{(Deterministic Model)} \]

\[ C = \alpha + \beta.Y + U \quad \text{(Stochastic Model)} \]

Where \( C \) = Consumption expenditure
\( \alpha \) = Intercept term (autonomous consumption)
\( \beta \) = Slope coefficient
\( Y \) = Monthly family income
\( U \) = Error term (represents the influence of variables other than income)

The first model explains that income as the only factor that influences consumption where as the second model explains that the consumption is influenced by not only income but by other factors also. It is obvious that the second model captures the reality in a better manner.
Types of variables:

1) Stocks and Flows

On the basis of nature of economic variables, they are measured at a point of time or by per unit of time. The value of some economic variables is constant over a period of time while that of the others are changing as time elapses. The former are called as stock variables and the latter are called as flow variables. For instance, GDP is a flow variable as its value changes as time elapses. If you compute the value of GDP every hour it changes as time elapse even though we do not compute like that due to the complexities involved in it. On the other hand, wealth is a stock variable. Its value will not change by every hour as what happens in the case of GDP. The value of wealth changes very slowly. Hence its value is measured at a point of time whereas the value of a flow variable is measured per unit of time. That is why GDP is often measured per year. The list of some common stock and flow variables are given below:

<table>
<thead>
<tr>
<th>Stock</th>
<th>Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wealth</td>
<td>Income, Expenditure</td>
</tr>
<tr>
<td>Debt</td>
<td>Fiscal deficit, Revenue deficit</td>
</tr>
<tr>
<td>Capital</td>
<td>Investment</td>
</tr>
<tr>
<td>Unemployment</td>
<td>Number of persons losing jobs</td>
</tr>
</tbody>
</table>

2) Exogenous and Endogenous Variables

Endogenous variables are variables whose value is determined within the model and exogenous variables are variables whose value is determined outside the model. Alternatively, endogenous variable is the variable whose value is explained by the model but for an exogenous variable the model cannot explain its value. Consider the following model:

\[ C = \alpha + \beta \cdot Y + U \]

The variable ‘C’ that stands for consumption expenditure is the endogenous variable as its values is determined by the model. But the value of the variable ‘Y’ that stands for monthly family income is supplied from outside the model. The data on monthly family income is collected through a survey. Hence it is considered as exogenous variable.
3) **Ex ante and Ex post**

These are Latin terms and the meaning of ex ante is ‘before the event’ and ex post is ‘after the event’. The terms are introduced into economics by the Stockholm school during the 1920s and 1930s. It was Erick Lindahl in 1924 who first introduced the term ex post. A more comprehensive treatment of both these terms is given by the Nobel laureate Gunnar Myrdal in his thesis on expectations and price changes published in 1927. It is because of this reason Myrdal’s name is associated with the introduction of these terms into economics. But these terms are popularised by another Nobel laureate Bertil Ohlin with the publication of Stockholm theory of savings and investment.

The purpose of these terms is to emphasis the time factor in economic analysis. Myrdal used these terms to emphasise the fundamental difference between ‘foreseen’ and ‘unforeseen’ changes. Myrdal argued that expectations under uncertainty are to be analysed by including the time element in the calculation of the value of economic variables ‘before the event’ and ‘after the event’. The importance of these terms in macroeconomics is that the divergence in the value of a variable both ex ante and ex post due to uncertainty are often encountered and considered as one of the relevant factors for determining the level of employment.

4) **Static, Comparative Static and Dynamic**

The branch of economic analysis that confines its attention to equilibrium positions is called “Statics”. The most useful variety of statics is ‘comparative statics’ which compares equilibrium positions corresponding to two or more sets of external circumstances. Static analysis, whether simple or comparative, concentrates only on equilibrium positions. It does not concern itself with the time it takes for an equilibrium position to be achieved or with the path by which variables approach their equilibrium states.

“Dynamics” is considered essentially with states of disequilibrium and with change. Whether the disequilibrium involves the absence of short-run equilibrium or the condition and movement of an economy not in long-run equilibrium, study of movement and change is the province of dynamic analysis. This is sometimes oversimplified by describing dynamics as the study of the movement of economic variables toward equilibrium, or from one equilibrium position to another. Although such study is an important and useful exercise in dynamic analysis, it retains the tie to the equilibrium concept.
A more formal and sophisticated definition makes the essence of dynamics to be that it studies systems or models involving relations that hold overtime. That is, relationships in which the value that obtains now for a variable may depend not only on the simultaneous values of other variables but soon previous values of other variables.

5) Equilibrium and Disequilibrium

A system can be said to be in equilibrium when all of its significant variables show no change and when there are no pressures or forces for change that will produce subsequent change in the values of significant variables. States of equilibrium need never be realized in the economy for equilibrium analysis to be useful tool of thinking. Corresponding to any given set of external circumstances, there may be some pattern of economic variables which would show no further tendency to change. Assuming for the moment that there are forces in an economy that push it toward equilibrium when it is not in that state, a description of the equilibrium position is a description of the directions in which economic variables are headed. The external circumstances that determine the equilibrium may always be changing so that equilibrium may always be changing so that equilibrium is never attained. Nevertheless, it remains useful to know the directions in which variables are headed at any given time whether they are expected to reach their equilibrium values or not.

There are circumstances in which disequilibrium produces only a tendency for further change, which may not be in the direction of equilibrium. Even in this circumstance, it is useful to be able to identify the equilibrium that would lead to cessation of further change. States of equilibrium may be of several sorts. Since economic variables are of both stock and flow varieties, full equilibrium would be one in which all stocks as well as flows were stable. This would necessarily mean that net flows that add to the stocks would, at equilibrium, be zero. Such a concept of full equilibrium for the economy as a whole is that of the classical “stationary state”, in which the community’s stock of capital is just maintained with zero net saving and investment. Such a state of full equilibrium has questionable relevance to our economic society.

Circular Flow of Income

The concept was first introduced by the French economist Francois Quesnay. Quesnay was a trained surgeon and his knowledge in medical science helped him to take the example of blood circulation proved by the British physician William Harvey to explain the
inter connectivity between different economic activities. Let us take an economy with two sectors only—households and firms. Households are basically consumer units and they own factors of production. Firms produce goods while households provide services of the factors of production to these firms. Factors of production receive incomes for rendering their services. The sales value of net production must equal the sum total of payments made by the firms to the factors of production in the form of wages, rents, interest and profits. These incomes are spent on various goods and services by households. Thus income flows from firms to households in exchange of productive services while products flow in return when expenditure by households takes place.

The figure given below explains the circular flow for an economy with single input labour and single output cloth.

**Figure 1.1: Circular Flow of an Economy**

The inner loop shows the flow of labour units from the households to the firms and from firms households receive cloth. This inner loop represents the flow of goods. The outer loop represents the flow of income/expenditure. Firms give wages to the labour which becomes the income of the households. The households in turn spend this income for buying the cloth produced by the firm and hence it becomes the expenditure of the households. It is
now clear that the GDP is equal to the income received by the households from the labour and the expenditure on the purchase of cloth.

In short, circular flow of income is defined as the flow of payments and receipts for goods and services and factor services between different sectors of the economy. There are two types of flows—money flows and real flows. Money flow is the flow of income/payments in terms of money. Real flow refers to the flow of goods and services. National income is both a flow of goods and services and flow of money income. The following are the assumptions that are considered for explaining circular flow of income in two-sector model simple economy.

1. The economy is closed economy. That is, there is no foreign sector;

2. Households do not produce but provide factors of production;

3. Firms or business sector is the only producing sector;

4. Whatever is produced by firms is sold and there is no accumulation of inventories;

5. Consumers or household sector do not save their income but spend all their income;

6. There is absence of taxes, government expenditure on goods and services etc.

It is thus clear that, production in a two sector model equals sales and income equals expenditure. In real working of circular flow of income, however, there are injections and leakages in the economy. Injections are factors which increase spending flow and leakages are those factors which reduces spending. For instance, households usually save a part of their income. This savings cause leakages from the income stream or flow in the economy. Similarly, when we pay taxes to the government, our income gets reduced by the amount of tax paid. This is also an important form of leakage. On the other hand, if government spends on goods and services, it increases income which acts as a stimulant to production. This is an injection in the economy.

In the simple two sector circular flow of income model the state of equilibrium is defined as a situation in which there is no tendency for the levels of income (Y), expenditure (E) and output (O) to change,

that is: \( Y = E = O \).
This means that all household income (Y) is spent (E) on the output (O) of firms, which is equal in value to the payments for productive resources purchased by firms from households.

Example: This can be shown in an example where John earns 100.00, he doesn't save it and spends it all on the goods and services (O) provided by the firms.

**Two Sector Model with Financial Market**

Financial institutions act as intermediaries between savers and investors. All the lending and borrowings are carried on in the financial or capital market. All that is earned by the households is not spent on consumption; a part of it is saved. This saving is deposited in the financial market leading to a money flow from the household to the financial market. On the other hand, the firm saves to meet its depreciation expenses and expansion. The savings of the firm going into the financial market and borrowings made by the firm from the financial market also create money flows.

![Figure 1.2: Circular Flow in Two Sector Model with Capital Market](image)

Therefore, we can say that the savings by households and firms are leakages and borrowings by the firms act as injections into the circular flow of income.

**Circular Flow of Income in a Three Sector Model**

In this model, we introduce the government sector as well that purchases goods from firms and factors services from households. Between households and the government money flows from government to the household when the government makes transfer payments. Like old age pension, scholarship and factors payments o the households. Money flows back to the
government when it collects direct taxes from the households. Similarly, there are flows of money between the government sector and firm sector. Money flows from firms to government when the government realises corporate taxes from the firms.

Money flows from the government to the firms in form of subsidies and payment made for the goods purchased.

**Figure 1.3: Circular Flow in Three Sector Model**

![Circular Flow in Three Sector Model](image)

**Circular Flow of Income in a Four Sector Model**

In a four sector model, an economy moves from being a closed economy to an open economy. In an open economy imports and exports are made. You must understand that one country’s exports are other country's imports. In case of a country imports, money flows to the rest of the world and in case of exports, money flows in from the rest of the world. An economy experiences a trade surplus if its exports exceed its imports. On the other hand, there is a trade deficit if imports exceed exports. Imports act as leakages and exports as injection into the circular flow of income in an economy. The following figure shows the four sector model in an economy:

**Figure 1.4: Circular Flow in Four Sector Model**

![Circular Flow in Four Sector Model](image)
In a 4 sector model, we have,

\[ Y = C + I + G + (X-M) \]

Where, \( Y \) = Income or Output
\( C \) = Household consumption expenditure
\( I \) = Investment expenditure
\( G \) = Government expenditure
\( X-M \) = Exports minus Imports

**Measurement of National Income**

National income is generally defined as the value of final goods and services produced in a country in an accounting year. However, it can be defined in terms of– total output (as defined above), total factor income and total expenditure. In terms of total factor income, it is the sum of factor incomes (wage, rent, interest, profit) in a country in a year. Factors of production viz., land, labour, capital and organization/entrepreneur earns reward as rent, wage, interest and profit respectively. The sum of these rewards is the national income in terms of income generated in the economy. National income, in terms of total expenditure, is
the aggregate expenditure of a country in a year’s time. Spending of households, private sector and government sector in a country adds up to national income by expenditure method. National income at current prices is the money value of all goods and services produced in a country estimated at the prevailing prices. National income at constant prices is the national income estimated at a base year, which is an earlier year to the current year. National income at constant prices is used for making comparisons of national income and related data.

There are three methods of measuring national income. These are the following:

1. Net output method/Value added method/product method/industry of origin method,

2. Income method, and

3. Expenditure method.

These methods are explained as under:

1. **Net Output Method/Value Added Method/Product Method/Industry of Origin Method**

This method measures national income as the sum of net final output produced or net value added by all the firms in a year.

**Steps to Estimate National Income by Value added/Product Method**

National income by product method can be estimated using the following steps:

1. **Identification of production units and classifying them into industrial sectors:** The first step is to identify all the production units and classify these into three industrial sectors (i) primary sector, (ii) secondary sector, and (ii) tertiary sector.

2. **Estimation of net value added:** Net value added is estimated by estimating gross output produced by each enterprise, intermediate consumption, depreciation and net indirect taxes. Gross value of output can be measured by multiplying goods produced by the firms by their market prices. In other words, sales and change in stocks of all firms together gives the value of gross output. Net value added at market price is obtained by deducting the value of intermediate consumption (value of inputs that a firm obtains from other production units) and depreciation from gross value of output. Further, to get net value added at factor cost, we have to deduct net indirect taxes. Net indirect taxes are the indirect taxes less subsidies. The sum of net value added of all
the industrial enterprises in the domestic territory of a country gives us net domestic product at factor cost.

3. Estimation of net factor income from abroad: The final step is to estimate net factor income from abroad and add it to the net domestic product in order to get national income or NNPfc. Net factor income from abroad is the factor income of the residents of a country earned abroad less the factor income of foreign nationals earned in the domestic territory of the country.

Thus, National Income or NNPfc = NDPfc + Net factor income from abroad

**Precautions in the Estimation of National Income by Product Method**

We have to take certain precautions while measuring national income by value added method. There are certain items which should not be included and items which are to be included while estimating national income. Households construct residential buildings for their living and business sector constructs factory buildings for the production of goods. These are own account production of fixed assets, the value of which is to be estimated at prevailing market price and included in the national income. Similarly, certain items are produced for self consumption which does not enter the market. Their value is also required to be calculated at the prevailing price in the market. Imputed rent is rent calculated for owner occupied houses. Rent of owner occupied houses is generally not calculated. For the sake of measuring national income, it must be estimated at the prevailing market price.

Households, government and private sector sell those goods which are worn or torn out. These are second hand goods. Any transactions (sale and purchase) related to second hand goods are not included in the national income since their value has already been included in the year of their production. These do not involve any new production in the economy. However, we must not forget to include commission or brokerage earned out of such transactions (to be used in measuring national income by income method). Any transactions related to financial assets such as sale and purchase of bonds and shares are also not to be included in the measurement of national income. Such transactions do not generate any new income or contribute to the flow of goods and services. These are only paper claims transferred from one hand to the other. For example, when we buy shares of a company, money from our hand goes to company's hand without any new production taking place in this transaction. Finally, services rendered by housewives are also excluded from the
measurement of national income as they render services out of love, affection and sense of duty to their family. Such transactions are useful but not economic as these do not involve generation of income.

The items that are included and not included are summarized in the table below:

Table 1.1: Items to be included and not included in Product Method

<table>
<thead>
<tr>
<th>Items to be included</th>
<th>Items to be excluded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own account production of fixed assets</td>
<td>Sale and purchase of second hand goods</td>
</tr>
<tr>
<td>Food and other items for self consumption</td>
<td>Sale and purchase of bonds and shares</td>
</tr>
<tr>
<td>Imputed rent of owner occupied houses</td>
<td>Services of housewives.</td>
</tr>
</tbody>
</table>

**Difficulties of the Product Method**

The following difficulties arise while estimating national income by the product method:

1. Prices are not stable. These change frequently. In such situations, finding value of inventories becomes quite difficult.
2. It is difficult to determine the prices of goods which do not enter market and are kept for self-consumption. For instance, the value of owner-occupied buildings or imputed rent cannot be easily determined.
3. A clear cut distinction between the intermediate goods and the final goods is always not possible. Final goods for some may be intermediate goods for others.
4. In case the value of a capital good rises or falls due to changes in market conditions, it becomes difficult to estimate the depreciation.
5. It is still not clear whether services should be included in national income or not.
6. Lack of adequate and reliable data particularly in the unorganized and unincorporated enterprises is also a major problem in measurement of national income by value added method.

**2. Income Method**

We know that factors of production viz., land, labour, capital and organization assist in production and get reward for their factor services. The reward that the factors of production receive for their services is called ‘factor income’. The factors receive payments both in cash and kind. This is factor cost to the producer, which is equal to the factor income received by the factors of production. The income method measures national income at the point of factor
payments made to primary factors for the use of their services in the production process. In other words, national income is measured by taking sum total of all the incomes arising to primary factors of production. Thus, national income is the sum of rent, wages, interest and profits. The steps to be followed while calculating national income by income method are explained briefly as below:

1. Identification of production units and classifying them into industrial sectors: The first step is to identify producing enterprises which employ factor services and classifying them into various industrial sectors such as primary, secondary and tertiary.

2. Classification of factor incomes: The factor incomes are classified into three categories—compensation of employees, property income and mixed incomes. Compensation of employees includes payments made by producers to their employees in the form of wages and salaries — both in cash and in kind, and contribution towards social security schemes. Property income is the income paid for the ownership and control of capital such as dividend (part of company’s profit distributed to shareholders), undistributed profits (part of profit retained by companies for their development and other activities), corporate taxes (taxes levied on companies’ income), interest, rent, royalties (payments made for the use of mineral deposits, use of patents, copyrights, trademarks etc), profits etc. Mixed income is the combination of wage and property incomes of self-employed (those who provide their own labour and capital services) people such as doctors, lawyers, shopkeepers, farmers, barbers, etc.

3. Estimation of domestic factor income: Domestic factor income is obtained by adding up the incomes generated in each industrial sector. In other words, the sum total of compensation of employees, property income and mixed incomes by all the production units in the domestic territory of the economy during an accounting year gives the value of domestic factor income.

4. Estimation of net factor income from abroad: The last step is to estimate net factor income from abroad and add it to the net domestic product to get national income.

**Precautions in the Estimation of National Income by Income Method**

As already stated, income received from sale and purchase of second hand goods should not be included but commission earned in such transactions is to be included as this is new
income generated in the economy. Transfer payments which do not generate income are to be excluded from the measurement of national income. Incomes from gambling, smuggling etc are not to be included as these are illegal activities. Windfall profits or gains are sudden incomes arise due to favorable conditions at certain times such as income from lotteries etc. These are not hard earned income. Such income is not included in the national income. Income from interest on national debt is also not included in the national income. Income from interest on national debt is the income from financial capital, which are only paper claims and they do not generate any new income. These are merely transfer of money from public to government.

The table below shows items to be included and excluded while calculating national income by income method.

Table 1.2: Items to be included and not included in Income Method

<table>
<thead>
<tr>
<th>Items to be included</th>
<th>Items to be excluded</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Value of production for self consumption, such as agricultural products.</td>
<td>1. Income received from sale and purchase of second hand goods.</td>
</tr>
<tr>
<td>2. Imputed rent of owner occupied houses.</td>
<td>2. Income received from sale and purchase of bonds and shares.</td>
</tr>
<tr>
<td></td>
<td>3. All transfer payments like pensions, scholarships, subsidies.</td>
</tr>
<tr>
<td></td>
<td>4. Illegal incomes such as income from smuggling, gambling etc.</td>
</tr>
<tr>
<td></td>
<td>5. Corporation taxes.</td>
</tr>
<tr>
<td></td>
<td>6. Interest on national debt.</td>
</tr>
<tr>
<td></td>
<td>8. Windfall gains, such as income from lotteries.</td>
</tr>
</tbody>
</table>

Difficulties of the Income Method

The following difficulties arise while estimating national income by the income method:
1. To estimate mixed income of self employed people is not an easy task. It is difficult to get reliable information from unincorporated sector/unorganized sector.

2. Some economists opine that interest on national debt is used for productive purposes and therefore its value should be included. Thus, there is controversy whether to include it or not.

3. Income tax returns (account of incomes of an individual) are the basis of calculation of income received in the country. In underdeveloped countries a very small proportion of income earners actually pay taxes. Therefore, income method may be of limited use in such countries.

3. **Expenditure Method**

Expenditure method measures national income at the disposition stage/spending point. It measures national income by computing final expenditure on gross domestic product by households, government and private sector.

**Components of Final Expenditure**

The final expenditure in gross domestic product consists of the following:

1. **Private final consumption expenditure:** It includes expenditure on goods and services by the households and private non-profit institutions such as schools, clubs etc.

2. **Government final consumption expenditure:** It includes expenditure on administration, defense, maintenance of law and order, education etc.

3. **Gross domestic capital formation:** It consists of expenditure on capital goods by the producers. It increases capital stock in the economy.

4. **Net exports of goods and services:** The value of import of goods and services minus the value of export of goods and services is called net exports.

The steps to be followed while calculating national income by expenditure method are explained briefly as below:
1. Estimation of private final consumption expenditure: To get final consumption expenditure by households and non-profit institutions serving as households, volume of goods and services on which money is spent is multiplied with their retail prices.

2. Estimation of government final consumption expenditure: Government final consumption expenditure is calculated in terms of the cost to the government as government services have no market price. This is because general government does not sell goods in the market. Therefore, cost to the government is the sum total of compensation of employees and the cost of the goods and services purchased by the government. Thus, government final consumption expenditure includes compensation of employees (wages and salaries) and net value of goods and services purchased by the government both in domestic and international market.

3. Estimation of gross domestic capital formation: It comprises expenditure on construction, machinery and equipments and changes in stocks.

4. Net exports: The last step is to find the value of net exports i.e., exports value minus imports value of goods and services.

The sum total of private and government final consumption expenditure, gross domestic capital formation and net exports gives us GDP at market prices. To get NNP at factor cost or national income, we have to deduct depreciation and net indirect taxes from GDP at market prices and add net factor income from abroad to it.

**Precautions in the Estimation of Expenditure**

The items to be included and excluded while estimating national income by expenditure method are as follows:

(1) Expenditure on secondhand goods should not be included because they are the part of the stock of goods produced in the past.

(2) Expenditure on the purchases of shares, bonds, etc., should not be included because these are paper titles, which only represent the ownership of property. No material things are produced through the purchase/sale of shares, bonds, etc.,

(3) Expenditure on pensions, scholarships, unemployment allowance, etc., should not be included because these are transfer payments.

(4) Expenditure on intermediate goods or semi-finished goods should be excluded to avoid double counting.
Real and Nominal GDP

In simple terms, GDP means the total finished products, goods, and services produced within a country during a particular period. That means GDP is a price tag about an economy’s total market value during a particular period. That is, Gross domestic Product (GDP) is the market value of all final goods and services produced within a country in a given period of time. The GDP is the officially recognized totals. The following equation is used to calculate the GDP:

\[ GDP = C + I + G + (X - M) \]

Written out, the equation for calculating GDP is:

GDP = private consumption + gross investment + government investment + Government spending + (exports – imports).

Here’s how we will break down GDP = C + G + I + NX

- Here, C stands for consumers’ spending during a particular period.
- G stands for government’s spending.
- I stands for businesses’ capital spending.
- NX stands for net exports which can be further described as exports – imports.

For the gross domestic product, “gross” means that the GDP measures production regardless of the various uses to which the product can be put. Production can be used for immediate consumption, for investment into fixed assets or inventories, or for replacing fixed assets that have depreciated. “Domestic” means that the measurement of GDP contains only products from within its borders.

Nominal GDP

The nominal GDP is the value of all the final goods and services that an economy produced during a given year. It is calculated by using the prices that are current in the year in which the output is produced. In economics, a nominal value is expressed in monetary terms. For example, a nominal value can change due to shifts in quantity and price. The nominal GDP takes into account all of the changes that occurred for all goods and services produced during a given year. If prices change from one period to the next and the output does not change, the nominal GDP would change even though the output remained constant.
- Nominal GDP is the GDP which is calculated at the current market price. That means nominal GDP expressed all recent changes in the market.

Real GDP
The real GDP is the total value of all of the final goods and services that an economy produces during a given year, accounting for inflation. It is calculated using the prices of a selected base year. To calculate Real GDP, you must determine how much GDP has been changed by inflation since the base year, and divide out the inflation each year. Real GDP, therefore, accounts for the fact that if prices change but output doesn’t, nominal GDP would change.

- Real GDP, on the other hand, is calculated by taking a base year as a determinant. For example, if we need to calculate the real GDP of 2016 and if we would take 2010 as the base year; we would calculate the real GDP by taking all the quantities of goods, services, finished products and then would multiply with the prices of 2010.
MODULE II

Classical Macroeconomics

Classical Economics

The term "classical economics" was coined by Karl Marx to refer to the economics of David Ricardo and James Mill and their predecessors. However, the usage was subsequently extended to include the followers of Ricardo. The term Classical economics refers to work done by a group of economists in the eighteenth and nineteenth centuries. They developed theories about the way markets and market economies work. The study was primarily concerned with the dynamics of economic growth. It stressed economic freedom and promoted ideas such as laissez-faire and free competition. Famous economists of this school of thought included Adam Smith, David Ricardo, Thomas Malthus and John Stuart Mill and J.B.Say.

The Classical Theory

The fundamental principle of the classical theory is that the economy is self-regulating. Classical economists maintain that the economy is always capable of achieving the natural level of real GDP or output, which is the level of real GDP that is obtained when the economy's resources are fully employed. While circumstances arise from time to time that cause the economy to fall below or to exceed the natural level of real GDP, self-adjustment mechanisms exist within the market system that work to bring the economy back to the natural level of real GDP. The classical doctrine—that the economy is always at or near the
natural level of real GDP—is based on two firmly held beliefs: **Say's Law** and the belief that prices, wages, and interest rates are flexible. The classical approach to macroeconomics is that individuals and firms act in their own best interest. The wages and prices adjust quickly to achieve equilibrium in the free market economy. Classical macroeconomics is the theory and the classical model of the economists Adam Smith, David Ricardo, John Mills and Jean Baptiste Say.

**Assumptions of the classical macroeconomics**

The Classical theories made a number of assumptions about the markets and their competitiveness.

1. There is freedom of entry and exit. No monopoly elements are present in the market to prevent newcomers from entering the market or stopping the present ones from quitting the market.
2. Prices and wages are flexible in both upward and downward directions according to the demand and supply forces.
3. No single seller or buyer of a product has sufficient market power to influence the industry price, nor does any supplier or purchaser of labor services have sufficient market power to influence the market wage rate.
4. Thus all economic agents are price-takers and not price-setters.
5. The markets are competitive and so disequilibrium can only exist for a short period of time.
6. The prices and the wages are changing and flexible. So, if for some reason the product market were experiencing excess demand in some industry, with quantity demanded greater than quantity supplied, prices would rise until quantity demanded once again equaled quantity supplied. The rise in price returns the market to equilibrium.
7. Wages and prices are flexible and hence if there were an excess supply of workers, wages would decline until equilibrium in the labor market were restored.
8. There is full employment in the economy.
9. All economic decision-makers are assumed to be operating by having all the information they needed to make the best decisions.
As a result of the above assumptions, a prediction of the classical system is that it essentially operates at full employment on a long-run equilibrium path over time. While in the short run unemployment can result, it can’t exist permanently because wage rates fall when there is excess supply of labor. As workers compete for jobs, then by the law of demand, wage rates fall and the quantity of labor services hired by firms increases. Alternately, if there were a labor shortage, the wage rate would rise as firms compete for workers. The classical model incorporates the notion that the economy is on a long-run moving equilibrium path, and any deviations from long run equilibrium are not permanent because wage and price flexibility can remove excess demands or excess supplies.

**Say’s Law of Markets**

John-Baptiste Say (1767-1832) is one of the most important and insightful thinkers in the history of economic science. Say was a major proponent of Adam Smith’s self-directing economic system of competition, natural liberty, and limited government. J.B. Say was the original supply-sider and documented that production is the source (reason) of consumption and placed supply over demand in the hierarchy of economics. A person’s ability to demand goods and services from others proceeds from the income produced by his own acts of production. His level of production determines his ability to demand. Demanding products requires money which, in turn, requires a prior act of supply. The production of goods causes income to be paid to those who produce. In other words, a person sells his labor services or assets for money which he then uses to demand products. In the end, when exchanges have been affected, it will be found that a person has paid for goods and services with other goods and services. The demand for any commodity is a function of the supply of other commodities. Thus, Say's law, or the law of market, is an economic principle of classical economics. Say's law is based upon the fact that every production of goods also creates incomes equal to the value of goods produced and these incomes are spent on purchasing these goods. In other words, production of goods itself creates its own purchasing power. Therefore, Say’s law is expressed as “Supply creates its own demand”. In other words, the supply of goods produced creates demand for it equal to its own value with the result that the problem of general overproduction does not arise. Say's law was generally accepted throughout the 19th century. Say’s Law of Markets, a key component of the classical school of economics, describes the process through which supplies in general are translated into demands in general. For Say, the balance between aggregate supply and
aggregate demand is an ex ante identity. From this perspective, supply equals demand only because of, and to the amount of, people’s demand for other goods. Demand is supply seen from another angle. Because supply is demand there cannot be an excess of supply over demand. The demand for products can be said to be rooted in the production of products.

Thus, according to Say’s Law supply creates its own demand, i.e., the very act of producing goods and services generates an amount of income equal to the value of the goods produced. Say’s Law can be easily understood under barter system where people produced (supply) goods to demand other equivalent goods. So, demand must be the same as supply. Say’s Law is equally applicable in a modern economy. The circular flow of income model suggests this sort of relationship. For instance, the income created from producing goods would be just sufficient to demand the goods produced.

(b) Saving-Investment Equality: There is a serious omission in Say’s Law. If the recipients of income in this simple model save a portion of their income, consumption expenditure will fall short of total output and supply would no longer create its own demand. Consequently there would be unsold goods, falling prices, reduction of production, unemployment and falling incomes.

However, the classical economists ruled out this possibility because they believed that whatever is saved by households will be invested by firms. That is, investment would occur to fill any consumption gap caused by savings leakage. Thus, Say’s Law will hold and the level of national income and employment will remain unaffected.

(c) Saving-Investment Equality in the Money Market: The classical economists also argued that capitalism contained a very special market – the money market – which would ensure saving investment equality and thus would guarantee full employment. According to them the rate of interest was determined by the demand for and supply of capital. The demand for capital is investment and its supply is saving. The equilibrium rate of interest is determined by the saving-investment equality. Any imbalance between saving and investment would be corrected by the rate of interest. If saving exceeds investment, the rate of interest will fall. This will stimulate investment and the process will continue until the equality is restored. The converse is also true.

What Say stated was that the supply of a good constitutes demand for everything that is not that good. Aggregate supply thus creates its own aggregate demand. Within the
context of a free market system, the supply of each producer makes up his demand for the supplies of other producers. Therefore, in the aggregate, demand always equals supply and the general overproduction of goods is meaningless and impossible. According to Say, it was possible to have a surplus or a shortage of any specific commodity. Production can be misdirected and too much of some products can be produced for which there is insufficient demand. He said that gluts of production did not occur through general overproduction, but instead through overproduction of certain goods in proportion to others which were under produced. Say thus admits that there can be short-term gluts of a particular commodity. The market, left to its own devices, permits such imbalances to be corrected through adjustments of prices and costs. Any disequilibrium in the economy exists only because the internal proportions of output differ from the proportions preferred by consumers and not because production is excessive in the aggregate. It follows that overproduction or a glut can only take place temporarily when too many means of production are applied to one type of product and not enough to others. This type of disequilibrium is normally quickly remedied in a free market economy as market incentives and rational self-interest lead to adjustments in production, prices, marketing strategies, and so on. People have a rational self-interest in correcting their errors.

According to Say, savings is beneficial and it is used in the production of capital goods or in additional production. When production exceeds consumption, the difference is savings, which goes toward the production of investment goods, which are the basis for future growth. There will be no deficiency in aggregate demand as long as savings are reinvested in productive uses. Say argued that savings searching for profits goes quickly into investments for production. Say contended that money is a neutral mechanism through which aggregate supply is transformed into aggregate demand. He viewed money as an intermediate good that enables people to buy. In Say’s system, money serves chiefly as a medium of exchange and was not explicitly identified as a store of wealth. He viewed inflation as a monetary phenomenon rather than the result of excessive employment and economic growth. Say viewed interest rates as the price of credit. He understood that market-determined interest rates perform the function of a market clearing price for money.

Assumptions of the Say's Law of Market:

The classical model is based mainly on the following four assumptions:
(i) **Pure competition exists.** No single buyer or seller of commodity or an input can affect its price.

(ii) **Wages and prices are flexible.** The wages and prices of goods are free to move to whatever level the supply and demand dictates.

(iii) **Self interest.** People are motivated by self interest. The businessmen want to maximize their profits and the households want to maximize their economic well being.

(iv) **No government interference.** There is no necessity on the part of the government to intervene in the business matters.

Say's Law states that in a market economy, goods and services are produced for exchange with other goods and services. That is to say, the total supply of goods and services in a market economy will equal the total demand derived from consumption during any given time period. In other words, "general gluts cannot exist" although there may be local imbalances, with gluts in one market balanced by shortages in others. Nevertheless, for some neoclassical economists, Say's Law implies that economy is always at its full-employment level. Say's law implies that there cannot be a general glut, so that a persistent state in which demand is generally less than productive capacity and high unemployment results, cannot exist. Keynesians argued that the Great Depression demonstrated that Say's law is incorrect. Keynes, in his General Theory, argued that a country could go into a recession because of "lack of aggregate demand".

**Say's Law in a Barter Economy**

According to say, supply creates its own demand. This is explained as according to say, whatever is produced in the barter economy is sold out. Hence nothing remains unsold and there is no possibility of over production. As a result, there is no possibility of general unemployment. For example, if a person produces cloth whiles the other produce the wheat, they both exchange with one another. Hence nothing will remain unsold and no producer will face losses. Consequently, there will be no unemployment. In the barter economy people produced goods either for their own use or to exchange them with the other goods. So in this process there is an aggregate demand as well as aggregate supply. Under this mechanism, it is the value of good which clears the market. If the price of one good is higher than that of another good, the resources will shift from the production of low value good to the production of high value good. In this way the value of the good will fall where the resources
are moving and value of the good will rise where from the resources are coming out. In this way equalization process starts till equilibrium value is settled in the market.

**Say’s Law in a Money Economy**

It is not easy to say what exactly Say's law says about the role of money apart from the claim that recession is not caused by lack of money. The phrase "products are paid for with products" is taken to mean that Say has a barter model of money. One can read Say as stating simply that money is completely neutral, although Say did not state that explicitly.

To Say, as with other Classical economists, it is quite possible for there to be a glut (excess supply, market surplus) for one product, and it co-exists with a shortage (excess demand) for others. But there is no "general glut" in Say's view, since the gluts and shortages cancel out for the economy as a whole. But what if the excess demand is for money, because people are hoarding it? This creates an excess supply for all products, a general glut. Say's answer is simple – there is no reason to engage in hoarding money. According to Say, the only reason to have money is to buy products. It would not be a mistake, in his view, to treat the economy as if it were a Barter economy. However, in classical economics, there was no reason for persistent depressions, such as that of the 1930s, in a free market according to laissez-faire principles. The flexibility of markets under laissez faire allows prices, wages, and interest rates to adjust to abolish all excess supplies and demands.

During the worldwide Great Depression, in the first half of the 20th century, a school of economics arose that disputed Say's conclusions, called Keynesian economics. The debate between classical economics and Keynesian economics continues today. The need to offer a good to demand another good is obvious in a barter economy but also applies in a money economy. The whole of neoclassical equilibrium analysis implies that Say's law in the first place functioned to bring a market into this state – Say's law is the mechanism through which markets functions. Thus, Say's law says that free markets can solve the economy's problems automatically. Some proponents of Say's law argue that such intervention is always counterproductive. Consider Keynesian-type policies aimed at stimulating the economy. Increased government purchases of goods (or lowered taxes) merely "crowds out" the private sector's production and purchase of goods. According to Keynes, the implication of Say's "law" is that a free-market economy is always at full employment.
Keynes versus Say

For Keynes, the decision to save is not automatically coordinated with the amount of investment needed and desired by businessmen. He says that whether or not entrepreneurs and businessmen invest depends upon a number of subjective and irrational psychological factors instead of simply depending on the availability of savings at a low interest rate. According to Keynes, too much savings in the economy is the cause of the unemployment of resources. He contended that the Say’s system was only true in the special case when savings equals investment. He says that, because this is rarely the case, economists need a general theory to explain unemployment. Keynes believed that the breakdown of Say’s Law came about because of a lack of aggregate demand which results from the disequilibrium of planned savings and planned investment. For Keynes, savings can be too high or too low. Either way, he considers savings to be dangerous, self-defeating, and the source of the problem. According to Keynes, savings is a destructive “leakage” from the economy. In the end, Keynes concludes that (1) when savings are less than investment, government action is necessary to stimulate investment and (2) when savings are greater than investment, government action is needed to encourage consumption expenditures. In both cases, it is up to the government to step in.

Propositions and Implications of the Law

1. **Full Employment in the Economy**

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

2. **Proper Utilisation of Resources**

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

3. **Perfect Competition**

   Say’s Law of market is based on the proposition of perfect competition in labour and product markets. Other conditions of perfect competition are given below:
a. **Size of the Market** – According to Say’s Law, the size of the market is large enough to create demand for goods. Moreover, the size if the market is also influenced by the forces of demand and supply of various inputs.

b. **Automatic Adjustment Mechanism** – The law is based on this proposition that there is automatic and self adjusting mechanism in different markets. Disequilibrium in any market is a temporary situation. For instance, in capital market, the equality between saving and investment is maintained by rate of interest while in the labour market the adjustment between demand and supply of labour is maintained by the wage rate.

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

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

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

**CRITICISM OF SAY’S LAW**

1. **Supply does not Create its Demand**
   Say’s law assumes that production creates market for goods. Therefore, supply creates its own demand. But this proposition is not applicable to modern economics where demand does not increase as much as production increases. It is also not possible to consume only those goods which are produced within the economy.

2. **Self-Adjustment not Possible**
   According to Say’s Law, full employment is maintained by an automatic and self adjustment mechanism in the long run. But Keynes had no patience to wait for the long period for he believed that “In the long run we are all dead.” It is not the automatic adjustment process which removes unemployment. But unemployment can be removed by increase in the rate of investment.
3. **Money is not Neutral**

Say’s Law of market is based on a barter system and ignores the role of money in the system. Say believes that money does not affect the economic activities of the market. Conversely, Keynes has given due importance to money. He regards money as a medium of exchange. Money is held for income and business motives. Individuals hold money for unforeseen contingencies while businessmen keep cash in reserve for future activities.

4. **Over Production is Possible**

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

5. **Underemployment Situation**

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

6. **State Intervention**

Say’s Law is based on the existence of laissez faire policy. But Keynes has highlighted the need for state intervention in the case of general overproduction and mass unemployment. Laissez faire, in fact led to the Great Depression, had the capitalist system been automatic and self adjusting. This would not have occurred. Keynes therefore advocated state intervention for adjusting supply and demand within the economy through fiscal and monetary measures.

**MONEY WAGES AND REAL WAGES**

The amount of wages paid in money is called money wages. It is also called nominal wages. Thus, the total amount of money earned by a person as wages during a certain period is called money wages. The term real wages refers to wages that have been adjusted for inflation. This term is used in contrast to nominal wages or unadjusted wages. Real wages
provide a clearer representation of an individual's wages. Thus real wages are wages in terms of goods and services the money wages will buy.

Real Wage = Money Wage / General Price Level

**WAGE-PRICE FLEXIBILITY**

The classical economists generally assumed full-employment. The cornerstone of classical automatic full employment was their deep faith in the downward flexibility of money wages and prices. According to them, unemployment is caused by wages being too high. Hence, the remedy for unemployment lies in lowering the wage rates. According to the classical, the basic determinant of the volume of employment is the level of wages. In a free market economy, the free working of the market forces of demand and supply for labour determines market wage rate which avoids the possibility of unemployment. If there is unemployment, the market wage rate would fall till the supply of labour is equal to the demand for labour and full employment is restored. Thus, the classical economists believed that there was always full employment in the economy and in case of unemployment, a general cut in money wages will result in full employment in the economy. The idea that a general cut in money wages will lead the economy to full employment was mainly suggested by A.C.Pigou. According to him, in a competitive economy, when money wages are reduced, the cost of production will be lowered. This would lower the prices of products. When prices fall, demand increases and sales will increase and increased sales will increase employment resulting in full employment. The classical belief was based on the assumption that changes in money wages are related directly and proportionately to real wages. So when money wage rate is reduced, the real wage is also reduced to the same extent. Consequently, unemployment is reduced and full employment prevails.

**The Classical View of the Labor Market**

Classical economists assumed the labor market was similar to the goods market in that price would adjust to ensure that quantity demanded equaled quantity supplied. When demand would increase, the price of labor (the wage rate) would also increase. This would increase quantity supplied (the number of workers or hours worked) and quantity demanded of labor. Conversely, a decrease in the demand for labor would depress wages and the units of labor supplied would decrease. The demand for labour by firms decreases at higher wage rates whereas households the supply of labour will increases at higher wage rates. In other
words, at higher wage rates, people that were formerly not in the labour force will be lured into working by higher wages. Conversely, at low wage rates, more people will choose not to participate in the labor force. In the classical view of the labor market, all unemployment is voluntary. When the economy goes into a recession and the demand for labour falls, the wage rate will decline and people will opt out of the labor force.

**WAGE-PRICE FLEXIBILITY AND FULL EMPLOYMENT**

The Classical economists proved the validity of full employment. According to them, the amount of production which the business firms can supply does not depend only on aggregate demand or expenditure but also on the prices of products. If the rate of interest temporarily fails to bring about equality between saving and investment and as a result deficiency of aggregate expenditure arises, even then the problem of general over-production and unemployment will not arise. This is because they thought that the deficiency in aggregate expenditure would be made up by changes in the price level. When due to the increase in the savings of the people, the expenditure of the people declines; it will then affect the prices of products. As a result of fall in aggregate expenditure or demand, the prices of products would decline and at reduced prices their quantity demanded will increase and as a result all the quantity produced of goods will be sold out at lower prices. In this way, they expressed the view that in spite of the decline in aggregate expenditure caused by the increase in savings, the real output, income and employment will not fall provided the fall in prices of products is proportionate to the decline in aggregate expenditure. They believed that a free-market capitalist economy actually works in that way. Owing to the intense competition between the sellers of products as a consequence of the fall in expenditure, the prices will decline. This is because when aggregate expenditure on goods or demand for them declines, the various sellers and producers reduce the prices of their products so as to avoid the excessive accumulation of stocks of goods with them. Hence, according to the classical logic, increased saving will bring down the prices of products and not the amount of production and employment. But now a question arises to what extent the sellers or producers will tolerate the decline in prices. However, to make their business profitable they will have to reduce the prices of the factors of production such as labour. With a fall in wages of labour, all workers will get employment. If some workers do not want to work at
reduced wages, they will not get any job or employment and therefore will remain unemployed. But, according to classical economists, those workers who do not want to work at lower wages and thus remain unemployed are only voluntarily unemployed. This voluntary unemployment is not real unemployment. According to the classical thought, it is involuntary unemployment which is not possible in a free-market capitalist economy. All those workers who want to work at the wage rate determined by market forces will get employment.

During the period 1929-33 when there was a great depression in capitalist economies, a renowned neoclassical economist Pigou suggested a cut in wage rates in order to remove huge and widespread unemployment prevailing at that time. According to him, the cause of depression or unemployment was that the Government and trade unions of workers were preventing the free working of the capitalist economies and were artificially keeping the wage rates at high levels. He expressed the view that if the wage rates were cut down, the demand for labour would increase so that all would get employment. It was at this time that J.M. Keynes challenged the classical theory and put forward a new theory of income and employment. He brought about a fundamental change in economic thought regarding the determination of income and employment in a developed capitalist economy. Therefore, it is often said that Keynes brought about a revolution in our economic theory.

**KEYNES’S CRITICISM OF THE CLASSICAL VIEW**

Keynes did not accept the classical view that reduction in money wages led to full employment. He emphasized that unemployment could be removed by raising the effective demand. According to Keynes, a cut in money wages applied to the economy as a whole reduces employment rather than increasing it. According to Keynes, when money wages are reduced in the economy, they will reduce money incomes of the workers who will reduce their demand for products. Total expenditure will fall and lead to a decline in effective demand and employment.

**Classical theory of interest**

The Classical theory of interest defines the rate of interest as the element that equates savings and investment. Here investment is nothing but the demand for investible resources.
and savings is their supply. The rate of interest that is determined by the interaction of investment and savings is the price of the investible resources.

Criticism of the Classical Theory of Interest

1. The fact that the demand for capital, the effect of interest on savings out of a fixed income level are all given, there should be a strong correlation between the interest rate and the income level.

2. If the interest rate, the demand for capital and the sensitivity of the marginal propensity to save to a change in the interest rate are all given then the income level would be the factor that would equate savings with investment.

3. Again according to the classical theory, if the demand curve for capital shifts or both shift, then the new equilibrium rate of interest would be determined at the new point of intersection. This concept is criticised to be totally wrong since the constancy of income does not tally with the notion that the two curves shift independent of each other. The shift of either of the two curves would change the income level and hence the entire assumption of fixed income level breaks down.

CLASSICAL THEORY OF EMPLOYMENT AND OUTPUT DETERMINATION

In this unit, we examine briefly the Classical view of Full employment and how employment and output are determined according to classical economists.

The Classical Theory

The Classical economists generally include economists like Adam Smith, Ricardo, Mill, Marshall and Pigou. The fundamental principle of the classical theory is that the economy is self-regulating. Classical economists maintain that the economy is always capable of achieving the natural level of real GDP or output, which is the level of real GDP that is obtained when the economy's resources are fully employed. While circumstances arise from time to time that cause the economy to fall below or to exceed the natural level of real GDP, self-adjustment mechanisms exist within the market system that work to bring the economy back to the natural level of real GDP. The classical doctrine—that the economy is always at or near the natural level of real GDP—is based on two firmly held beliefs: Say's Law and the belief that prices, wages, and interest rates are flexible.

Classical Assumptions
The classical economics is based upon the following assumptions:

1. There is a state of full employment.
2. There is perfect competition in the product and labour markets.
3. There is closed laissez faire economy.
4. Supply always creates its own demand.
5. There is perfect wage –price flexibility.
6. The quantity of money is given.
7. Money acts only as a medium of exchange.

**Classical View of Full Employment**

Full employment is a condition of the national economy, where all or nearly all persons willing and able to work at the prevailing wages are able to work. The simplest definition of full employment is that it is a situation in the economic system characterized by the absence of involuntary unemployment. It is also defined as absolutely 0% rate of unemployment or as the level of employment rates when there is no cyclical unemployment. It is defined by economists as being an acceptable level of natural unemployment above 0%. The absolute full employment in the sense of providing jobs to the entire labour force may not be possible because of the immobility of the workers from one industry to another or from one place to another. Thus, there may be a continuous existence of surplus manpower in some of the labour markets while others may have shortages of manpower. So long as the margins of unemployment are matched by equivalent labour shortages elsewhere in the economy, the employment may be assumed to be full.

Thus, full employment is compatible with the existence of some unemployment which is frictional in character and arises due to factor immobilities, temporary layoffs caused by seasonal nature of employment. The involuntary unemployment is caused by the excess supply of labour over the demand for it. The 20th century British economist William Beveridge stated that an unemployment rate of 3% was full employment. Other economists have provided estimates between 2% and 13% as full employment depending on the country, time period, and the various economists' political biases. An alternative, more normative, definition would see "full employment" as the attainment of the ideal unemployment rate, where the types of unemployment that reflect labor-market inefficiency (such as structural unemployment) do not exist. Only some frictional unemployment would exist, where workers
are temporarily searching for new jobs. For example, Lord William Beveridge defined "full employment" as where the number of unemployed workers equaled the number of job vacancies available. Full employment does not mean that there is 'zero unemployment', but rather that all of the people willing and able to work have jobs at the current wage rate. Full employment is the quantity of labour employed when the labour market is in equilibrium.

The Relationship between Employment and Output

The classical neutrality proposition implies that the level of real output will be independent of the quantity of money in the economy. We consider what determines real output. A key component of the classical model is the short-run production function. In general terms at the micro level a production function expresses the maximum amount of output that a firm can produce from any given amounts of factor inputs. Classical full employment equilibrium is perfectly compatible with the existence of frictional and voluntary unemployment, but does not admit the possibility of involuntary unemployment. The increase in production during short period becomes essentially a function of increased inputs of factor services like labour (N), capital (K) and land (L).

\[ Q = f (N,K,L) \]

Given the above aggregate production function, the variations in the factor inputs may increase the output either in the same proportion, or in a greater or lesser proportion. However for the economic system as a whole, the level of output in the short period varies directly with the input of labour, while the inputs of capital and natural resources (land) remain constant.

THE CLASSICAL THEORY OF EMPLOYMENT (Determination of the Level of Employment and Output)

The basic contention of classical economists was that if wages and prices were flexible, a competitive market economy would always operate at full employment. That is, economic forces would always be generated so as to ensure that the demand for labour was always equal to its supply. In the classical model the equilibrium levels of income and employment were supposed to be determined largely in the labour market. At lower wage rate more workers will be employed. That is why the demand curve for labour is downward sloping. The supply curve of labour is upward sloping because the higher the wage rate, the greater the supply of labour.
In the following figure the equilibrium wage rate \( (w_o) \) is determined by the demand for and the supply of labour. The level of employment is \( OL_o \).

2.1 Determination of Employment and output

The lower panel of the diagram shows the relation between total output and the quantity of the variable factor (labour). It shows the short-run production function which is expressed as \( Q = f(K, L) \), where \( Q \) is output, \( K \) is the fixed quantity of capital and \( L \) is the variable factor labour. Total output \( Q_o \) is produced with the employment of \( L_o \) units of labour. According to classical economists this equilibrium level of employment is the ‘full employment’ level. So the existence of unemployed workers was a logical impossibility. Any unemployment which existed at the equilibrium wage rate \( (W_o) \) was due to frictions or restrictive practices in the economy in nature.

The classical economists believed that aggregate demand would always be sufficient to absorb the full capacity output \( Q_o \). In other words, they denied the possibility of under
spending or overproduction. This belief has its root in Say’s Law. According to Say’s Law supply creates its own demand, i.e., the very act of producing goods and services generates an amount of income equal to the value of the goods produced.

There is a serious omission in Say’s Law. If the recipients of income in this simple model save a portion of their income, consumption expenditure will fall short of total output and supply would no longer create its own demand. Consequently there would be unsold goods, falling prices, reduction of production, unemployment and falling incomes. However, the classical economists ruled out this possibility because they believed that whatever is saved by households will be invested by firms. That is, investment would occur to fill any consumption gap caused by savings leakage. Thus, Say’s Law will hold and the level of national income and employment will remain unaffected.

The classical economists also argued that capitalism contained a very special market – the money market – which would ensure saving-investment equality and thus would guarantee full employment. According to them the rate of interest was determined by the demand for and supply of capital. The demand for capital is investment and its supply is saving. The equilibrium rate of interest is determined by the saving-investment equality. Any imbalance between saving and investment would be corrected by the rate of interest. If saving exceeds investment, the rate of interest will fall. This will stimulate investment and the process will continue until the equality is restored. The converse is also true.

**Price Flexibility:** The classical economists further believed that even if the rate of interest fails to equate saving and investment, any resulting decline in total spending would be neutralized by proportionate decline in the price level. That is, Rs 100 will buy two shirts at Rs 50, but Rs 50 will also buy two shirts if the price falls to Rs 25. Therefore, if households saves more than firms would invest, the resulting fall in spending would not lead to decline in real output, real income and the level of employment provided product prices also fall in the same proportion.

**Wage Flexibility:** The classical economists also believed that a decline in product demand would lead to a fall in the demand for labour resulting in unemployment. However, the wage rate would also fall and competition among unemployed workers would force them to accept lower wages rather than remain unemployed. The process will continue until the wage rate falls enough to clear the labour market. So a new lower equilibrium wage rate will be
established. Thus, involuntary unemployment was logical impossibility in the classical model.

**THE CLASSICAL THEORY OF FULL EMPLOYMENT**

The classical theory is the theory of full employment. It outlines a model which ensures equilibrium at full employment. The equilibrium levels of aggregate output and employment are determined by the aggregate production function and the demand and supply of labour. The aggregate production function postulates a positive relationship between output and employment. A higher level of output is associated with a higher level of employment.

\[ Q = f (N, \bar{K}, \bar{T}) \]

where \( q \) denotes the level of output, \( N \) is the level of employment and \( \bar{K} \) and \( \bar{T} \) represent the fixed stock of capital and technology respectively. The demand function of labour is derived from the aggregate production function. As employment increases, the output also increases, the marginal physical product of labour (MP\(_L\)) declines. Marginal physical product of labour curve which incidentally is the demand curve for labour, will thus have a negative slope. Any business firm, hiring workers, will provide employment to labour up to an extent where the real wages paid out to the workers become equal to the marginal physical product of labour. The essential condition for profit-maximisation on the part of a firm, thus, is:

\[ WP = MP_L \]

Since the demand for labour is determined by the MPL which diminishes with an increase in output and employment and the real wage (W/P) equals the MPL, the demand for labour is also a function of real wages

\[ DL = f (W/P) \]

The demand function of labour varies inversely with the real wage rates.
On the supply side, it may be pointed out that work involves strain, exertion and sacrifice of leisure. This makes additional work-load or a large number of labour-hours quite disagreeable to the workers and is generally known as the marginal disutility of labour. Unless this disutility of work is neutralized through the payments of additional real wages, the workers cannot be induced to put in additional labour input. Thus the supply of labour-hours is related positively to the real wages of the workers.

\[ S_L = g \left( \frac{W}{P} \right) \]

Figure 2.2 Determination of Employment and Output

Given the demand and supply functions of labour, it is possible to determine the equilibrium level of employment, when the demand for labour gets equalized with the supply of labour at the equilibrium real wage rate \( \left( \frac{W}{P} \right)_0 \). If the real wage rate \( \left( \frac{W}{P} \right)_1 \) is higher than this equilibrium rate, the labour supply will be in excess of the demand for labour, denoting a state of unemployment among the workers and initiating a tendency among the workers to bid down the wages for securing more job opportunities. The decline of real wages will reduce the unemployment gap and there would be a tendency towards the achievement of equilibrium at full employment \( (N_0) \). If the real wage, on the other hand, is lower than the equilibrium wage rate, say \( \left( \frac{W}{P} \right)_2 \), the employers will like to absorb more workers. But the workers will be reluctant to take up the jobs offered by the employers, since the disutility of work is more in proportion to the real wages. Consequently, the employers will have to raise real wages in order to hire more workers. The equilibrium is determined ultimately at the full
employment level $N_0$. At $(W/P)_1$ real wage rate, there is an unemployment gap equal to $AB$ which tends to be wiped out by the competition among the workers for more jobs and the equilibrium at $(W/P)_0$ wage rate is finally determined at $N_0$ full employment level. At a lower real wage rate $(W/P)_2$, there is an over-employment gap equivalent to $A_1 B_1$ which denotes a state of excess demand for labour. This will push up the wage rate and tend it to approximate to $(W/P)_0$.

The equilibrium level of employment $N_0$ represents a state of full employment. It is presumed that all the persons who are willing and able to work at $(W/P)_0$ wage rate have been absorbed, except a very small proportion of the frictionally unemployed labour force. At $(W/P)_0$ equilibrium real wage rate which is perfectly consistent with the marginal product of labour, if a certain number of workers are not willing to work, it will clearly mean that these people do not offer their services voluntarily and the level of employment existing in the economy denotes full employment of the employable workers. In the classical system, the unemployment and over-employment gaps tend to be automatically adjusted, over time, through the adjustment mechanism manifest in the wage-flexibility. Any lapse from full employment, assuming the price level to be unchanged would be easily overcome in this system through the variations in wage rates.

**Classical System without Saving and Investment**

The classical system of full employment equilibrium involves adjustments of the variables in labour market, goods market and money market. The goods market gives the aggregate production function, which indicates different levels of output at different inputs of labour, assuming the stock of capital and technique of production to be given in the short period. The demand for and supply of labour in the labour market determine the equilibrium level of employment, which in the classical system, always coincides with the state of full employment. The money market explains the determination of the price level. The supply function of money determines the price level quite independent of the levels of labour inputs and output.

The functional relationships involved in the three market classical system without saving and investment are given below:

$$Q = f(N, K, T) \quad (i)$$
\[ DL = f(S/P) \] …(ii)
\[ SL = f(W/P) \] …(iii)
\[ MV = PQ \] …(iv)

The classical system of full employment equilibrium not involving the saving and investment has been shown in Figure 2.3.

In part (iii) of Figure 3.3, MV is money supply function which is a rectangular hyperbola, since the quantity theory relation \( MV = PQ \) holds all along the curve. It relates the level of output and price. Given the level of output \( Q_0 \) (which remains constant by assumption), there can only be one relevant price level \( P_0 \). Part (iv) of the figure represents the price-wage adjustments, \( (W/P)_0 \)

Figure 2.3 Classical System without Saving and Investment
\( Ie, \ OQ= Output, \ ON= Employment, \ OP=Price, \ OW/P=Real\ Wage, \ OW=Money\ Wage \)

Represents the equilibrium real wage line which is the locus of different money wage rates and price levels such that the real wage rate throughout remains the same. Given this equilibrium real wage rate and the equilibrium price \( P_0 \) there is only one money wage rate \( W_0 \) consistent with the both. Part (i) of the figure shows the production function which relates the level of output to the level of the labour inputs, when the stock of capital and techniques of production are assumed to be given. The production function indicates that the level of output \( Q_0 \) corresponds with the level of employment \( N_0 \). Part (ii) of the figure shows that the
demand function of labour along with labour supply function determines the equilibrium in
the labour market at N0 full employment level with the equilibrium real wage rate at (W/P)_0.

**Classical System with Saving and Investment**

The classical model we have been discussing is oversimplified because it does not recognize
the processes of saving and investment. We must now recognize that the income earned is not
fully spent for consumption goods; some part of this income is withheld from consumption, or
saved. Clearly, if planned investment spending is not equal to the income saved, Say’s Law is
invalidated. Another part of classical theory provides the mechanism that presumably assures
that planned saving will not exceed planned investment. This mechanism is the rate of interest.
Classical theory treated saving as a direct function of the rate of interest and investment as an
inverse function. The rate of interest will fluctuate freely over the wider range necessary to equate
saving and investment. To simplify the exposition of the classical system, let us assume here that
the curve is indeed elastic, so that investment is relatively responsive to changes in the rate of
interest. Small changes will then keep saving and investment in balance.

In other words, the classical analysis so far has been pursued on the assumption that
the community spends away its entire earnings by way of consumption and no part of it is
saved. Saving is one possible trouble spot in the otherwise harmonious picture of classical
system. Saving can make problems in Say’s Law. Although, the Classical’s recognized the
existence of saving, they interpreted saving as an alternative way of spending on capital
goods. In their scheme of analysis, all saving is automatically transformed into investment
spending. In this sense, any amount of saving is unlikely to cause any deficiency in
aggregate spending.

The basis of this strategic classical notion is the equilibrating mechanism of the rate of
interest, which is supposed to transform savings into an equivalent amount of investment.
The classical system postulates both saving and investment as the functions of the rate of
interest. Saving is assumed as a direct function of the rate of interest and investment as the
inverse function of it and that saving and investment can be brought into equilibrium by the
variations in the rate of interest. Thus in the classical system we must introduce the
following relations:

\[ S = f(r) \text{ (Saving function)} \]
Another significant fact in connection with the above relations is that saving and investment are supposed to be relatively more interest-elastic so that the volumes of saving and investment change with very small changes in the rate of interest.

An excess of ‘S’ over ‘I’ can be offset through a reduction in the rate of interest. On the opposite, a rise in the rate of interest can restore equality between them, when investment exceeds saving. The possibility of transforming any level of saving into equivalent volume of investment through small variations in the rate of interest is based on the implicit assumption that there are infinite possibilities of new investment in the economy because, otherwise, the excess of full employment saving over investment will vitiate Say’s Law and permit the economic system to degenerate into secular stagnation.

The classical full employment system with saving and investment can be studied through the following set of equations:

\[
\begin{align*}
Q & = f(N, K, T) \quad \text{... (i)} \\
DL & = f(S/P) \quad \text{... (ii)} \\
SL & = f(W/P) \quad \text{... (iii)} \\
MV & = PQ \quad \text{... (iv)} \\
S & = f(r) \quad \text{... (v)} \\
I & = f(r) \quad \text{... (vi)} \\
S & = I \quad \text{... (vii)}
\end{align*}
\]

In addition to the four equations (i) to (iv), that we have used to analyse the classical system (without saving and investment), we have added a new set of equations (v) to (vii) which incorporates saving and investment relationship with rate of interest. These two sets have to be studied quite independently of each other, since the rate of interest and the division of output between the output of consumption and investment goods seems to be independent of the factors influencing the size of national output, quantity of money and the level of wages and prices. However, the impact of S-I inequalities upon the volume of employment needs to be investigated.
Excess of Saving over Investment: If the full employment ex-ante S exceeds the ex-ante I, it means that expenditure on consumption plus investment goods falls short of the value of total output. Given the supply of money, the surplus output can be cleared off the market at lower prices. The fall in price level will push up the real wage rate assuming the money wages to be given. The increase in real wage rate will cause an excess of the supply of labour over the demand for it. The appearance of unemployment will lower the level of output also. The interest rate flexibility will set into motion the process of adjustment. A fall in interest rate will reduce savings, thereby causing an increase in consumption expenditure. The investment expenditure will also increase. Given the supply of money, an increase in aggregate expenditure will raise the demand for money which will push up the prices resulting in a decline in real wages and a consequent reduction in the excess supply gap in the labour market. Thus, a reduction in the rate of interest, initiating a tendency towards equilibrium in the capital market, sets such forces into action which tend the labour market also towards equilibrium at full employment.

Excess of Investment over Saving

An excess of ex-ante I over S at the prevailing rate of interest will imply an excess of ex-ante expenditure over the value of current output. This will lead to an increase in the price level. The real wage rate will go down and create a state of excess demand in the labour market. That would ultimately be chocked off by a rise in the rate of interest, setting a chain reaction in the money market. Thus, the interest rate flexibility ensures a state of full employment in the economic system. It follows that classical system has an inbuilt mechanism in wage and interest rate flexibility which tend it continuously towards full employment whenever the economy faces certain lapses from full employment.

Wage-Price Flexibility and Full-Employment

The classical economists also proved the validity of the assumption of full-employment with another fundamental logic. According to them, the amount of production which the business firms can supply does not depend only on aggregate demand or expenditure but also on the prices of products. If the rate of interest temporarily fails to bring about equality between saving and investment and as a result deficiency of aggregate expenditure arises, even then the problem of general over-production and unemployment will not arise. This is because they thought that the deficiency in aggregate expenditure would be
made up by changes in the price level. When due to the increase in the savings of the people, the expenditure of the people declines; it will then affect the prices of products. As a result of fall in aggregate expenditure or demand, the prices of products would decline and at reduced prices their quantity demanded will increase and as a result all the quantity produced of goods will be sold out at lower prices. In this way, they expressed the view that in spite of the decline in aggregate expenditure caused by the increase in savings, the real output, income and employment will not fall provided the fall in prices of products is proportionate to the decline in aggregate expenditure.

Classical economists thought that a free-market capitalist economy actually works in that way. Owing to the intense competition between the sellers of products as a consequence of the fall in expenditure, the prices will decline. This is because when aggregate expenditure on goods or demand for them declines, the various sellers and producers reduce the prices of their products so as to avoid the excessive accumulation of stocks of goods with them. Hence, according to the classical logic, increased saving will bring down the prices of products and not the amount of production and employment. But now a question arises to what extent the sellers or producers will tolerate the decline in prices. However, to make their business profitable they will have to reduce the prices of the factors of production such as labour. With a fall in wages of labour, all workers will get employment. If some workers do not want to work at reduced wages, they will not get any job or employment and therefore will remain unemployed. But, according to classical economists, those workers who do not want to work at lower wages and thus remain unemployed are only voluntarily unemployed. This voluntary unemployment is not real unemployment. According to the classical thought, it is involuntary unemployment which is not possible in a free-market capitalist economy. All those workers who want to work at the wage rate determined by market forces will get employment.

During the period 1929-33 when there was a great depression in capitalist economies, a renowned neoclassical economist Pigou suggested a cut in wage rates in order to remove huge and widespread unemployment prevailing at that time. According to him, the cause of depression or unemployment was that the Government and trade unions of workers were preventing the free working of the capitalist economies and were artificially keeping the wage rates at high levels. He expressed the view that if the wage rates were cut down, the demand for labour would increase so that all would get employment. It was at this time that
J.M. Keynes challenged the classical theory and put forward a new theory of income and employment. He brought about a fundamental change in economic thought regarding the determination of income and employment in a developed capitalist economy. Therefore, it is often said that Keynes brought about a revolution in our economic theory.

**Flexible interest rates, wages, and prices**

Classical economists believe that under these circumstances, the interest rate will fall, causing investors to demand more of the available savings. In fact, the interest rate will fall far enough—from $i$ to $i'$ in Figure 1—to make the supply of funds from aggregate saving equal to the demand for funds by all investors. Hence, an increase in savings will lead to an increase in investment expenditures through a reduction of the interest rate, and the economy will always return to the natural level of real GDP. The flexibility of the interest rate as well as other prices is the self-adjusting mechanism of the classical theory that ensures that real GDP is always at its natural level. The flexibility of the interest rate keeps the **money market**, or the **market for loanable funds**, in equilibrium all the time and thus prevents real GDP from falling below its natural level.

Similarly, flexibility of the wage rate keeps the **labor market** or the **market for workers**, in equilibrium all the time. If the supply of workers exceeds firms’ demand for workers, then wages paid to workers will fall so as to ensure that the workforce is fully employed. Classical economists believe that any unemployment that occurs in the labor market or in other resource markets should be considered **voluntary unemployment**. Voluntarily unemployed workers are unemployed because they refuse to accept lower wages. If they would only accept lower wages, firms would be eager to employ them.

Thus, the Classical School believed that ‘real factors of production’ combined with free markets would increase the wealth of a nation. In summary, Classical economics: a) stressed the role of real as opposed to monetary factors in determining real outcomes like output and employment. Money was considered strictly a medium of exchange not a causal factor in economic growth; and, b) stressed the role of the self-adjusting marketplace to ensure output and employment. Government had no role in ensuring adequate demand or employment other than essential infrastructure, e.g. roads, canals and competitive markets.

According to classical, there are two types of variables in the Classical Model (in fact in all the models we will study). These are endogenous (within the system – capital, labour, wage and price) and exogenous (outside the system – technology, population growth). In the
Classical system the exogenous variables affect supply rather than demand. Thus if there is technological change then the MPN will change; if population increases or decreases the supply of labour will change. The Classical system does not consider demand to be a question. In effect, Say’s Law is assumed to hold: supply creates its own demand, and, accordingly, there is never a lack of aggregate demand.

So far we have considered only the real wage rate \( W/P \) as playing a role. The question arises as to what effect changes in the money wage and money price will have on output. If money \( P \) or \( W \) change then the real wage will change. If the real wage changes there will also changes in the demand and supply of labour. Given the money wage, a firm will choose the quantity of labour where:

\[
W = \text{MPN} \times P \quad \text{or, the money wage equals the MPN times the Price of goods and services.}
\]

If \( P \) increases then demand for labour will shift to the right, i.e. real wage falls; if \( P \) falls demand for labour will shift to the left. In fact the demand for labour is a function only of the real wage. A proportionate increase in \( W \) and \( P \) will thus result in the same demand for labour. Thus if firms compete by raising money wages to attract workers other firms that do not increase the money wage will loose workers and eventually exit the industry. However, to pay the higher money wage firms must increase prices which decrease the real wages until equilibrium is re-established with a higher money wage, higher money prices but the same level of output as at the beginning of the process. In fact the aggregate supply curve under the Classical model is vertical. No matter the price level, money wages will adjust to maintain the real wage and the real level of output.

Thus, according to the classicals, output is determined purely by supply factors and demand plays no role. Similarly factors like the quantity of money, level of government spending, and demand for investment goods are all ‘demand’ factors that play no role in determining output in the classical model. Taxes that affect supply-side factors will, however, affect output. However, factors affecting the classical equilibrium include changes in technology, reduction of the price of raw materials as well as growth of the capital stock. Thus, the Classical model is thus characterized by the supply-determined nature of real output and employment. The aggregate supply curve is vertical because of assumptions made about the labour market: (i) perfectly flexible wages and
prices; and, implicitly, (ii) perfect information, and, of course, perfectly competitive industries.

**Keyne’s Criticism of Classical Theory:**

J.M. Keynes criticized the classical theory on the following grounds:

1. According to Keynes saving is a function of national income and is not affected by changes in the rate of interest. Thus, saving-investment equality through adjustment in interest rate is ruled out. So Say’s Law will no longer hold.

2. The labour market is far from perfect because of the existence of trade unions and government intervention in imposing minimum wages laws. Thus, wages are unlikely to be flexible. Wages are more inflexible downward than upward. So a fall in demand (when S exceeds I) will lead to a fall in production as well as a fall in employment.

3. Keynes also argued that even if wages and prices were flexible a free enterprise economy would not always be able to achieve automatic full employment.

**THE QUANTITY THEORY OF MONEY - FISHER'S EQUATION OF EXCHANGE – CASH BALANCE APPROACH**

The Quantity Theory of Money seeks to explain the factors that determine the general price level in a country. The theory states that the price level is directly determined by the supply of money. The quantity theory of money 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. Thus, according to the quantity theory of money, when the supply of money increases the, the value of money falls and the price level increases. We know that inflation is persistent rise in the price level. Hence, on the basis of this definition, the quantity theory of money also states that growth in the money supply is the primary cause of inflation.

**Value of Money**

The basic causal relationship between the price level and the value of money is that as the price level goes up, the value of money goes down. The "value of money" refers to what a unit of money can buy whereas the "price level" refers to the average of all of the prices of goods and services in a given economy. A unit of money has its denomination printed on it known as the "face value," but the unit only has tangible value in relation to what a person
can buy with it. This is called its "purchasing power." The purchasing power of a given currency changes over time due to variations in supply and demand, but in general it slowly loses value as the price level rises.

**Price Level**

In contrast to the value of money, which is expressed in units, the price level is an aggregate. Because it is difficult, confusing and nearly impossible to accurately average all prices for all goods and services in an economy, the price level is most commonly analyzed by finding the price of a theoretical collection of goods and services. The price level inevitably increases over time due to inflation, though in most economies this increase is gradual.

**Relationship**

As the price level increases over time, the value of money decreases. In most countries, the price level increases slowly with inflation and changes in supply and demand. Like most things in economics, there is a market for money. The supply of money in the money market comes from the Central Bank. The Central Bank has the power to adjust the money supply by increasing or decreasing it. The demand for money in the money market comes from consumers. The determinants of money demand are infinite. In general, consumers need money to purchase goods and services. If there is an ATM nearby or if credit cards are plentiful, consumers may demand less money at a given time than they would if cash were difficult to obtain. The most important variable in determining money demand is the average price level within the economy. If the average price level is high and goods and services tend to cost a significant amount of money, consumers will demand more money. If, on the other hand, the average price level is low and goods and services tend to cost little money, consumers will demand less money. The value of money is ultimately determined by the intersection of the money supply, as controlled by the Central Bank and money demand, as created by consumers. The value of money, as revealed by the money market, is variable. A change in money demand or a change in the money supply will yield a change in the value of money and in the price level. The change in the value of money and the change in the price level are of the same magnitude but in opposite directions.

**Velocity**

The most important variable that intervenes the effects of changes in the money supply is the velocity of money. Velocity of money is defined simply as the rate at which
money changes hands. If velocity is high, money is changing hands quickly, and a relatively small money supply can fund a relatively large amount of purchases. On the other hand, if velocity is low, then money is changing hands slowly, and it takes a much larger money supply to fund the same number of purchases. The velocity of money is not constant. Instead, velocity changes as consumers' preferences change. It also changes as the value of money and the price level change. If the value of money is low, then the price level is high, and a larger number of bills must be used to fund purchases. Given a constant money supply, the velocity of money must increase to fund all of these purchases. Similarly, when the money supply shifts due to the Central Banks policy, velocity can change. This change makes the value of money and the price level remain constant.

The relationship between velocity, the money supply, the price level, and output is represented by the equation $M \times V = P \times Y$

where, $M$ is the money supply, $V$ is the velocity, $P$ is the price level, and $Y$ is the quantity of output. $P \times Y$, the price level multiplied by the quantity of output, gives the nominal GDP. This equation can thus be rearranged as $V = \frac{\text{nominal GDP}}{M}$. Conceptually, this equation means that for a given level of nominal GDP, a smaller money supply will result in money needing to change hands more quickly to facilitate the total purchases, which causes increased velocity. The equation for the velocity of money, while useful in its original form, can be converted to a percentage change formula for easier calculations. The velocity equation can be used to find the effects that changes in velocity, price level, or money supply have on each other. When making these calculations, remember that in the short run, output ($Y$), is fixed, as time is required for the quantity of output to change.

Let's try an example. What is the effect of a 3% increase in the money supply on the price level, given that output and velocity remain relatively constant? The equation used to solve this problem is (percent change in the money supply) + (percent change in velocity) = (percent change in the price level) + (percent change in output). Substituting in the values from the problem we get $3\% + 0\% = x\% + 0\%$. In this case, a 3% increase in the money supply results in a 3% increase in the price level. Remember that a 3% increase in the price level means that inflation was 3%.

In the long run, the equation for velocity becomes even more useful. In fact, the equation shows that increases in the money supply by the Central Bank tend to cause increases in the price level and therefore inflation, even though the effects of the Central Bank’s policy is slightly dampened by changes in velocity. This results a number of factors.
First, in the long run, velocity, V, is relatively constant because people's spending habits are not quick to change. Similarly, the quantity of output, Y, is not affected by the actions of the Central Bank since it is based on the amount of production. This means that the percent change in the money supply equals the percent change in the price level since the percent change in velocity and percent change in output are both equal to zero. Thus, we see how an increase in the money supply by the Central Bank causes inflation.

The velocity of money equation represents the heart of the quantity theory of money. By understanding how velocity mitigates the actions of the Fed in the long run and in the short run, we can gain a thorough understanding of the value of money and inflation. There are two versions of the Quantity Theory of Money: (1) The Transaction Approach and (2) The Cash Balance Approach. Let us discuss them in detail.

**QUANTITY THEORY OF MONEY (QTM)**

**Fisher’s Equation of Exchange or the Transaction Approach**

Irving Fisher an American economist put forward the Cash Transaction Approach to the quantity theory of money. He in his book The Purchasing Power of Money (1911) has stated that the value of money in a given period of time depends upon the quantity of money in circulation in the economy. It is the quantity of money which determines the general price level and the value of money. Any change in the money supply directly affects the general price level and the value of money inversely in the same proportion. In Fisher’s words, “Other things remaining unchanged, as the quantity of money in circulation increases, the price level also increases in direct proportion and the value of money decreases and vice versa”. For example, if the quantity of money in circulation is doubled other things being equal the general price level will be doubled and the value of money is halved. Similarly if the quantity of money is halved the price level will be halved and the value of money doubled. In Fisher’s Cash Transactions Version of Money, the general price level in a country, like the prices of commodities, is determined by the supply of and demand for money.

**(a) Supply of Money:** The supply of money consists of the quantity of money in circulation (M) and the velocity of its circulation (V) i.e., the number of times the money changes hands. Thus MV refers to the total volume of money in circulation during a period of time. For example, if the total money supply in Pakistan Rs. 5,000 billion and its velocity per unit of time is 10 times, then the total money supply would be Rs.5,000 x 10 = Rs.50000 billion.
(b) **Demand for Money**: People demand money not for its own sake. They demand money because it serves a medium of exchange. It is used to carry every day transactions. In short, the demand for money is for the exchange of goods.

**Assumptions of the theory**

1. **Full employment**: The theory is based on the assumption of full employment in the economy.

2. **T and V are constant**: The theory assumes that volume of trade (T) is the short run remains constant. So is the case with velocity of money (V) which remains unaffected.

3. **Constant relation between M and M1**: Fisher assumes constant relation between currency money M and credit money (M1).

4. **Price level (P) is a passive factor**: The price level (P) is inactive or passive in the equation. P is affected by other factors in equation i.e., T, M, M1, V and V1 but it does not affect them.

**Equation of Exchange**:

The Cash transaction version of the quantity theory of money was presented by Irving fisher in the form of an equation. Thus Fisher’s transaction approach to the Quantity Theory of Money may be explained with the following equation of exchange.

\[ MV = PT \]

Where,  
M is the total supply of money  
V is the velocity of circulation of money  
P is the general price level  
T is the total transactions in physical goods.

This equation is an identity, that is, a relationship that holds by definition. It means, in an economy the total value of all goods sold during any period (PT) must be equal to the total quantity of money spent during that period (MV). Fisher assumed that (1) at full employment total physical transactions T in an economy will be a constant, and (2) the velocity of circulation remain constant in the short run because it largely depends on the spending habits of the people. When these two assumptions are made the Equation of Exchange becomes the Quantity Theory of Money which shows that there is an exact, proportional relationship between money supply and the price level. In other words, the level of prices in the economy
is directly proportional to the quantity of money in circulation. That is, doubling the total supply of money would double the price level.

It may be noted that the above Fisher’s Equation include only primary money or currency money. But modern economy extensively uses demand deposits or credit money. It was on account of the growing importance of credit money that Fisher later on extended his equation of exchange to include credit money. Thus, the equation of exchange can be represented as follows:

\[ P = MV + M^i V^i \]

or

\[ PT = MV + M^i V^i \]

Here,

- \( P \) is the price Level
- \( M \) is the quantity of money
- \( V \) is the velocity of circulation of \( M \)
- \( M^i \) is the volume of credit money
- \( V^i \) is the velocity of circulation of \( M^i \)
- \( T \) is the total volume of goods and Trade

Fisherian relation between \( M \) and \( P \) can be explained with the help of a diagram. The figure below shows equi-proportionate changes between \( M \) and \( P \). As quantity of money increases from \( M_0 \) to \( M_1 \), price level rises from \( P_0 \) to \( P_1 \). Similarly, when the quantity of money increases from \( M_1 \) to \( M_2 \), the price level increases from \( P_1 \) to \( P_2 \) making the changes in the quantity of money equal to the changes in the price level.

**Figure 2.4 Relationship between Quantity of Money and Price Level**
Fisher’s Transaction Approach can explain the causes of hyperinflation that occurs during war or emergency. It can also explain certain long term trend in prices. But it cannot explain normal peace time inflation. This shortcoming has been modified by the Cambridge version or the Cash-Balance Approach.

**Criticism of the theory:**

The quantity theory is subjected to the following criticism.

1. **Unrealistic assumptions:** The theory is based on unrealistic assumptions. In this theory $P$ is considered as a passive factor. $T$ is independent. $M_1$, $V$, $V_1$, are constant in the short run. All these assumptions are covered under “Other things remaining the same.” In actual working of the economy, these do not remain constant; hence, the theory is unrealized and misleading.

2. **Various Variables in the transaction are not independent.** The various variables in transaction equation are not independent as assumed in the theory. The fact is that they very much influence each other. For example when money supply ($M$) increases the velocity of money ($V$) also goes up. Take another case. Fisher assumes ($P$) is a passive factor and has no effect on trade ($T$). In actual practice, when price level ($P$) rises, it increases profits and promotes trade ($T$).
(3) **Assumption of full employment is wrong.** J. M. Keynes has raised an objection that the assumption of full employment is a rare phenomenon in the economy and the theory is not real.

(4) **Rate of interest ignored.** In the quantity theory of Fishers, the influence of the rate of interest on the money supply and the level of prices have been completely ignored. The fact is that an increase or decrease in money supply has an important bearing on the rate of interest. An increase in money supply leads to a decline in the rate of interest and vice versa.

(5) **Fails to explain trade cycles.** The theory fails to explain the trade cycles. It does not tell as to why during depression, the increase in money supply has little impact on the price level. Similarly, in boom period the reduction in money supply or tight money policy may not bring down the price level. G. Crowther is right in saying, “The quantity theory is at best an imperfect guide to the cause of the business cycle”.

(6) **Ignores other factors of price level.** There are many determinants other than M, V, and T which have important implication on the price level. These factors such as income, expenditure, saving, investment, population consumption etc have been ignored from the purview of the theory.

**The Cash Balance Approach (Cambridge Approach)**

Fisher’s approach can be viewed as deterministic. Essentially, Fisher argued that, given the full employment volume of transactions and the speed with which the financial system could process payments, the quantity of money that agents required to hold was effectively determined. Alfred Marshall, A.C. Pigou, D.H. Robertson and J.M. Keynes at Cambridge School made an alternative formulation of the quantity theory of money which is known as Cash Balance equation. Like Fisher, the Cambridge School assumed that money was only held to expedite transactions and had no further purpose. Thus, if the money supply increased, agents holding the increased money stock would seek to get rid of it. However, the emphasis in this approach concentrated on establishing the quantity of money that agents would voluntarily desire to hold. The Cambridge school were in effect attempting to set out a theory of the demand for money.

The Cambridge approach emphasises that there are alternatives to holding money in the shape of shares and bonds. These assets yield a return which can be viewed as the
opportunity cost of holding money. As interest rates rise, agents will economise on money holdings and vice versa. Another factor that will influence money holdings is the expected rate of inflation. If inflation is expected to be high, then the purchasing power of money will fall. This will prompt agents to buy securities or commodities as a hedge against inflation. The Cambridge economists regarded the determination of value of money in terms of supply and demand. The supply of money is exogenously determined by the banking system. Therefore, the concept of velocity of circulation is altogether discarded in the cash balances approach. On the other hand, the concept of demand for money plays the major role in determining the value of money. The demand for money is the demand to hold cash balance for transactions and precautionary motives. Thus, the cash balance approach considers the demand for money not as a medium of exchange but as a store of value. The Cambridge equations show that given the supply of money at a point of time, the value of money is determined by the demand for cash balances. When the demand for money increases, people will reduce their expenditures on goods and services in order to have larger cash holdings. Reduced demand for goods and services will bring down the price level and raise the value of money. On the contrary, fall in the demand for money will raise the price level and lower the value of money.

**Marshall's Equation**

We may express the idea of Marshall in the form of an equation as follows:

\[ M = kPY \]

where \( M \) stands for the exogenously determined supply of money, \( k \) is the fraction of the real money income (PY) which people wish to hold in cash and demand deposits, \( P \) is the price level, \( Y \) is the aggregate real income of the community. Thus, the price level \( P = \frac{M}{kY} \) or the value of money (the reciprocal or price level) is \( \frac{1}{P} = \frac{kY}{M} \).

**Pigou’s Equation**

Pigou was the first Cambridge economist to express the cash balance approach in the form of an equation and his equation can be expressed as:
\[ P = \frac{kR}{M} \]

where \( P \) is the purchasing power of money (the value of money which is the reciprocal of the price level), \( k \) is the proportion of total real resources or income (\( R \)) which people wish to hold in the form of titles or legal tender, (Real Income), and \( M \) refers to the number of actual units in legal tender money.

The demand for money, according to Pigou, consists not only of legal money or cash but also bank notes and bank balances. In order to include bank notes and bank balances in the demand for money, Pigou modifies his equation as:

\[ P = \frac{kR}{M} \{c + h(1 - c)\} \]

Where, \( c \) is the proportion of total real income actually held by people in legal tender including token coins, \((1-c)\) is the proportion kept in bank notes and bank balances, and \( h \) is the proportion of actual legal tender that bankers keep against the notes and balances held by their customers.

Pigou’s equation explains the reason behind the value of money and also the motive behind people keeping larger or smaller proportions of their income in the form of money. During a period of rising prices, as the value of money decreases, people want to hold smaller proportion of their income in the form of cash while during the period of depression, as the value of money is rising; people want to keep larger proportion of their income in the form of cash.

**Criticisms of Cash Balance Approach**

The main drawbacks of the cash balance theory are as under:

(1) Use of Purchasing Power for consumption goods. The Cambridge economists give undue importance the purchasing power of money in term of consumption goods. The theory ignores speculative motive of demand for money.

(2) Role of rate of interest ignored. The cash balance theory excludes the role of rate of interest in explaining the changes in the price Level which is very important in influencing the demand for money.

(3) Unitary elasticity of demand. The Cambridge equation assumes that the elasticity demand for money is unity. This is not realistic in the dynamic society of today.
(4) Real income not the sole determinant of K. According to the Cambridge equation, real income only determines the value of K i.e., the cash held by people. The fact is that other factors as price level; banking and business habits of the people, political conditions in the country can influence the value of K.

(5) Simple Truism. The Cambridge equation, like the Fisherian equation establishes proportionate relationship between the quantity of money and the price level. \( M = KPY \). The theory does not explain as to how and why this relationship between the two is established.

(6) K and T assumed constant. The Cambridge economist like Irving Fisher also assumes that K and T remain constant. This is possible in a static situation but not in dynamic conditions.

(7) No explanation of business cycles. The Cambridge equations do not provide any explanation for the business cycles.

Comparison between Transactions and Cash Balance Approaches

There are similarities as well as dissimilarities between the Transactions and Cash balance approaches.

**Similarities**

1. Same conclusion about M and P: The basic conclusion in both the approaches is the same that the value of money or the price level is a function of the quantity of money.
2. Similar Equations: The two approaches use almost similar equations.
3. Both approaches consider that money serves as a medium of exchange in the economic system.

**Dissimilarities**

There are a lot of differences between the Transactions approach and Cash Balance approach of the quantity theory of money which are given below.

1. Functions of Money: The Fisherian approach lays emphasis on the medium of exchange function of money while the Cambridge approach emphasises the store of value function of money.
2. Flow and Stock: In Fisher’s approach money is a flow concept while in the Cambridge approach it is a stock concept.
3. V and k Different: In Fisher’s equation V refers to the rate of spending and in Cambridge equation k refers to the cash balances which people wish to hold.

4. Nature of Price level: In Fisher’s equation, P refers to the average price level of all goods and services. But in the Cambridge equation P refers to the prices of final or consumer goods.

5. Nature of T: In Fisher’s equation, T refers to the total amount of goods and services exchanged for money, whereas in the Cambridge equation T refers to the final or consumer goods exchanged for money.

Superiority of Cash Balance Approach over Transactions Approach

The Cash Balance approach to the Quantity Theory of Money is superior to the Transaction Approach on the following grounds.

1. The Transaction approach emphasizes the medium of exchange function of money only. On the other hand, the Cash Balance approach stresses equally the store of value function of money. Therefore, this approach is consistent with the broader definition of money which includes demand deposits.

2. In its explanation of the determinants of V, the Transaction approach stresses the mechanical aspects of the payments process. In contrast, the Cash Balance approach is more realistic as it is behavioral in nature which is built around the demand function for money.

3. As to the analytical technique, the Cash Balance approach fits in easily with the general demand-supply analysis as applied to the money market. This feature is not available in the Transaction approach.

4. The Cash Balance approach is wider and more comprehensive as it takes into account the income level as an important determinant of the price level. The Transaction approach neglected income level as the determinant of the price level.

5. According to the Transaction approach, the change in P is caused by change in M only. In the Cash Balance approach P may change even without a change in M if k undergoes a change. Thus k, according to the Cash Balance approach is a more important determinant of P than M as stressed by the Transaction approach.

6. Moreover, the symbol k in the Cash Balance approach proves to be a better tool for explaining trade cycles than V in Fisher’s equation.
NEUTRALITY OF MONEY

Neutrality of Money

Neutrality of money is an important idea in classical economics and is related to the classical dichotomy. If money is neutral, an increase in the quantity of money will merely raise the level of money prices without changing the relative prices and the interest rate. It implies that the central bank does not affect the real economy (e.g., the number of jobs, the size of real GDP, the amount of real investment) by printing money. Instead, any increase in the supply of money would be offset by an equal rise in prices and wages. This assumption underlies some mainstream macroeconomic models (e.g., real business cycle models) while others like monetarism view money as being neutral in the long-run. Neutrality of money is the idea that a change in the stock of money affects only nominal variables in the economy such as prices, wages and exchange rates, with no effect on real (inflation-adjusted) variables, like employment, real GDP, and real consumption. Thus, the classical economists believed in the neutrality of money. Neutrality of money means that money is neutral in its effect on the economy. Thus, neutrality of money is an economic theory that states that changes in the aggregate money supply affect only the nominal variables and do not affect real variables. Therefore, an increase in the money supply would increase all prices and wages proportionately, but have no effect on real economic output (GDP), unemployment levels, or real prices. The neutrality of money is based on the idea that changing the money supply will not change the aggregate supply and demand of goods, technology or services. The only impact of a change in the money supply is on the general price level. According to Don Patinkin the neutrality of money is a situation when a uniformly introduced increase in the quantity of money causes a proportionate increase in the equilibrium price of commodities and leaves the equilibrium rate of interest unaffected. In other words, money is neutral it does not affect relative prices and leaves the interest rate unaffected. All prices move equi proportionally. Thus, the quantity of money determines only absolute prices and their level does not affect the level of income, interest rate, capital formation and employment. It plays no role in the determination of employment, income and output. It was a cornerstone of classical economic thought, but modern-day evidence suggests that neutrality of money does not fully apply in financial markets.
In the classical system, the main function of money is to act as a medium of exchange. It is to determine the general level of prices at which goods and services will be exchanged. The quantity theory of money states that price level is a function of the supply of money. Algebraically, \( MV = PT \), where \( M \), \( V \), \( P \) and \( T \) are the supply of money, velocity of money, price level, and the volume of transactions (total output) respectively. The equation tells that the total money supply, \( MV \), equals the total value of output, \( PT \), in the economy. Assuming \( V \) and \( T \) to be constant, a change in \( M \) causes a proportionate change in \( P \). Thus, money is neutral whose main function is to determine the general price level at which goods and services exchange.

The neutrality of money is considered a plausible scenario over long-term economic cycles, but not over short time periods. In the short term, changes in the money supply seem to affect real variables like GDP and employment levels, mainly because of price stickiness and imperfect information flow in the markets. Central banks monitor the money supply closely, and step in (through open market operations) to change the money supply when conditions deem it necessary. Their actions indicate that short-term money supply changes can and do affect real economic variables.

**The Non-Neutrality of Money**

In the Keynesian system, when there are unemployed resources in the economy, money is non-neutral. Thus, an increase in the money supply produces non-neutral effects on the rate of interest, the level of employment, income and output, the rate of capital formation. As result of an increase in the money supply the interest rate will be lowered which increases investment which in turn increases employment, output and income.

**Money illusion**

The term “Money Illusion” was first used by the American economist, Irving Fisher. He used it to refer the failure to realize that the value of a unit of currency is liable to vary in value terms of what it will buy. In economics, money illusion refers to the tendency of people to think of currency in nominal, rather than real, terms. In other words, the numerical/face value (nominal value) of money is mistaken for its purchasing power (real value). Thus, money illusion is an economic theory stating that people have an illusory picture of their wealth and income based on nominal (dollar) terms, rather than in real terms. Real prices and income take into account the level of inflation in an economy. Thus, consumers are commonly
subject to ‘the money illusion’, whereby a consumer’s perception of the value of money is influenced by the nominal value of the currency. Money illusion is often cited as a reason why small levels of inflation (1-2% per year) are actually desirable for an economy. Having small levels of inflation allows employers, for example, to modestly raise wages in nominal terms without actually paying more in real terms. As a result, many people who get pay raises believe that their wealth is increasing, regardless of the actual rate of inflation.

Thus, even without a change in the real income, consumers will increase their consumption if they are subject to money illusion. Suppose for example, during a given period, the consumer price level rises by 10 percent and the current –dollar disposable income of the families also rises by 10 percent. Those families that recognize that their money income is unchanged in real terms suffer no money illusion and will maintain their consumption and saving unchanged in real terms (they will increase both spending and saving in current dollars by 10 percent). Other families may be subject to a money illusion in either of two ways. Some may see only that the price level has risen and somehow overlook the fact that their current-dollar disposable income has risen proportionately. They are actually no worse off, but they believe that they are and act accordingly. To the extent that families reduce the fraction of income saved in response to a decrease in real income, the families whose money illusion leads them to believe they have suffered a decrease in real income will reduce the fraction of income saved or increase the fraction consumed. This of course, involves real income was actually unchanged. Other families may see only the rise in their current-dollar rise in the price level. These families will feel better off and, accordingly, may increase the fraction of income saved or reduce the fraction consumed. This involves a decrease in real consumption, because their real income was actually unchanged.

If we assume that no widespread money illusion exists among consumers, we may expect no appreciable change in the faction of aggregate current-dollar disposable income devoted to consumption expenditure as a result of a change in the consumer price level accompanied by a proportional change in current dollar disposable income. In terms of the aggregate consumption function diagram, if we measure real income and real consumption on the two axes, the economy remains at the same points on the income and consumption axis.

If changes in the consumer price level are not matched by compensating changes in current dollar disposable income, there will be changes in real disposable income. A change in real disposable income directly affects real consumption expenditures. A rise in prices that
leads to a fall in real disposable income should move consumers as a group back down the aggregate short run consumption function. At this new point on the function, there will be an absolute decrease in real consumption expenditures and an increase in the fraction of real disposable income devoted to consumption expenditures. On the other hand, a fall in prices that leads to a rise in real disposable income moves consumers as a group up along the function. There will be an absolute increase in real consumption expenditures and a decrease in the fraction of real disposable income devoted to consumption expenditures. In short, a changing price level may affect real consumption expenditures to the extent that the changing price level is not offset by changes in current dollar disposable income, provided that consumers are not subject to money illusion.

**THE PIGOU EFFECT**

The Pigou effect also identified as the wealth effect was advocated by A.C Pigou. The term Pigou effect refers to the stimulation of output and employment caused by increasing consumption due to a rise in real balances of wealth, particularly during deflation. The Pigou effect was propounded by A.C. Pigou in 1943 to counter Keynes’ argument that wage-price deflation cannot lead to automatic full employment. Thus, the Pigou effect is an economics term that describes what happens in the economy, particularly with the aggregate consumption, if prices fall. It is an effect that deals with economic wealth. Wealth was defined by Arthur Cecil Pigou as the sum of the money supply and government bonds divided by the price level.

Thus, Pigou effect is a term in economics referring to the relationship between consumption, wealth, employment and output during periods of deflation. Defining wealth as the money supply divided by current price levels, the Pigou effect states that when there is deflation of prices, employment (and thus output) will be increased due to an increase in wealth (and thus consumption). Alternatively, with the inflation of prices, employment and output will be decreased, due to a decrease in consumption. Pigou fully recognized that interest-rate effect of Keynes that wage-price deflation raises investment and income through a reduction in the interest rate. But he did not agree that the real income cannot be raised to the level of full employment due to liquidity trap. According to Pigou, a wage-price deflation will generate automatic full employment via an increase in the level of consumption. He argued that when money wages are cut, prices fall and the value of money rises. The rise in the value of money means a rise in the real value of assets such as stocks, shares, bank
deposits, government securities, bonds, etc. For example, if prices fall by 50 per cent, the real value of each rupee will be doubled because it will purchase twice as much as it did before. The increase in the real value of fixed asset will make their owners feel richer than before. They will, therefore, save less out of their current income and spend more on consumption. This will increase aggregate demand and output, and will generate automatic full employment in the economy. As a result of the Pigou effect, the consumption function will shift upward (or the saving function will shift down-ward). In terms of the IS function, it means a rightward shift of the IS curve. Thus, Pigou argued that deflation due to a drop in aggregate demand would be more self-correcting. The deflation would cause an increase in wealth, causing expenditures to rise, and thus correcting the drop in demand. It is a concept that says that a large fall in prices would stimulate an economy and create the 'wealth effect' that will generate full employment. That is, as prices fall, more money becomes available to consumers for spending whose purchases create demand for more production and hence more jobs. The Pigou effect is also known as the real balance effect.

The important point in Pigou effect is that it is based on the assumptions of flexible wage and price levels, and a constant stock of money. Therefore, it is only the IS curve that shifts to the right with the increase in consumption or reduction in saving when the real value of fixed assets increases. The LM curve is assumed to be given because of the assumption of a constant stock of money. This is because the analysis of Pigou effect runs strictly in terms of static analysis.

Figure 2.5 The Pigou Effect
Another important point is that this analysis is based upon the flexibility of absolute prices. Patinkin summarises the Pigou effect in the following theorem: “There always exists a sufficiently low price level such that, if expected to continue indefinitely, it will generate full employment”. Algebraically, if the money supply which is assumed to be constant is $M_0$ and the price level is $P_1$ then the saving function (or consumption function) will be $S = f [RY (M_0/P)]$. Thus saving depends upon the interest rate (R), income (Y) and the ratio of given money supply to absolute prices ($M_0/P$). When prices fall the real value of a given stock of money rises and people reduce their saving or increase consumption, thereby increasing aggregate demand. This process will automatically lead the economy to the level of full employment when decline in wages and prices stops. In the Pigou effect, interest elasticities and positions of the saving and investment functions are irrelevant.

The Pigou effect is illustrated in Figure 3.5 (A) and (B). To begin with Panel (A) of the figure, suppose the economy is at $Y_1$ level of income as determined by IS$_1$ and LM$_0$ functions at $E_1$. Now wage-price deflation starts which raise the consumption function such that the IS$_1$ function shifts rightwards to IS$_3$. Given the LM$_0$ function, the IS$_3$ function intersects the LM$_0$ function at $E_3$ thereby raising the income level from OY$_1$ to OY$_F$, the full employment level. Panel (B) of the figure shows that as the price level falls from $P_3$ to $P_1$ with reduction in money wages, income increases from OY$_1$ to the full employment level.
OY_F through the increase in aggregate demand is the Pigou effect. This is shown by the downwards sloping aggregate demand curve AD.

**Criticisms of Pigou Effect**

The Pigou effect has been criticized on the following grounds:

1. The Pigou effect assumes that the depressing effect of a reduction in the price level is offset by its stimulating effect on creditors. A price decline will have different reactions on debtors and creditors. Pigou overlooked the possibility of microeconomic distributional effects.

2. The Pigou effect considers only the effects of a change in real balances on consumption or saving of the household sector. It neglects the influence of real balances on firms.

3. Pigou’s analysis assumes a definite knowledge about the effect of saving or consumption of an increase in the real balances which is not always true.

4. The Pigou effect is difficult to weigh quantitatively. It also neglects the role of price expectations.

**Keynes effect**

The Keynes effect is a term used in economics to describe a situation where a change in interest rates affects expenditure more than it affects savings. As prices fall, a given nominal amount of money will become a larger real amount. As a result the interest rate will fall and investment demanded rise. Thus, the process of increase in investment and employment via reduction in money wages and interest rate is called the Keynes effect. According to Keynes, as money wages and prices fall, money incomes also fall which means an increase in real incomes. People will, therefore, need less money for transactions and precautionary purposes. Assuming no change in the supply of money, this means that people have more money in liquid for than they need. It will increase the demand for money for speculative purposes. They will therefore, invest surplus money in purchasing securities and bonds. The increase in the demand for such financial assets will raise their prices which will reduce the rate of interest. Falling interest rate, in turn will raise investment, national income and employment. Keynes effect works through a shift in the LM curve.

**Classical Dichotomy**
In macroeconomics, the classical dichotomy is the division between the real side of the economy and the monetary side. According to the classical dichotomy, changes in monetary variables do not affect real values as output, employment, and the real interest rate. Money is therefore neutral in the sense that it cannot affect these real variables. Thus, classical dichotomy refers to the idea that real and nominal variables can be analyzed separately. Thus, the notion that changes to the variables that affect monetary values will not impact real values such as interest rates, employment, industrial output is known as classical dichotomy. To be precise, an economy exhibits the classical dichotomy if real variables such as output, unemployment, and real interest rates can be completely analyzed without considering what is happening to nominal variables. In particular, this means that GDP and other real variables can be determined without knowing the level of the nominal money supply or the rate of inflation. Therefore, in an economy that exhibits the classical dichotomy, the money supply only affects nominal variables like the price level. An economy exhibits the classical dichotomy if money is neutral. It is a feature of many classical and new classical theories of macroeconomics. Thus, according to the classical dichotomy, the goods and money markets are separate and stated that the relative price level is determined by the demand and supply of goods and the absolute price level is determined by the demand and supply of money.

The classical dichotomy was central to the thinking of early economists (money as a veil). Keynesians and monetarists reject the classical dichotomy, because they argue that prices are sticky. That is, they think prices fail to adjust in the short run, so that an increase in the money supply raises aggregate demand and thus alters real macroeconomic variables. Thus, the classical dichotomy was integral to the thinking of some pre-Keynesian economists ("money as a veil") as a long-run proposition. Keynesians reject the classical dichotomy, because they argue that prices are sticky. That is, they think prices fail to adjust in the short run, so that an increase in the money supply raises aggregate demand and thus alters real macroeconomic variables.

The Real Balance Effect (Patinkin’s Integration of Monetary Theory and Value Theory)

Don Patinkin in his monumental work, “Money, Interest and Prices” criticizes the dichotomization of goods and money markets by classical and has solved the classical dichotomy through his Real Balance Effect. According to the classical dichotomy, the relative price level is determined by the demand and supply of goods and the absolute price
level is determined by the demand and supply of money. After criticizing the classical dichotomy, Patinkin integrates the money market and the goods market of the economy through his Real Balance Effect. The Real Balances mean the real purchasing power of the stock of cash holdings (Money) of the people.

According to Patinkin, when the price level changes, it affects the purchasing power of people’s cash holdings which in turn, affects the demand and supply of goods. This is the real balance effect. Patinkin introduced the stock of real balances (M/P) held by community as an influence on their demand for goods. Thus, the demand for a commodity depends upon real balance as well as relative prices. If the price level rises, this will reduce the real balances (purchasing power) of the people who will spend less than before. This implies a fall in the demand for goods and the consequent fall in prices and wages. The price decline increases the value of money balances held by the people which, in turn, increase the demand for goods directly. The initial decrease in commodity demanded creates a state of involuntary unemployment. But unemployment will not last indefinitely because as wages and prices fall, the real balance effect tends to increase commodity demand directly and indirectly through the interest rate. With sufficiently large fall in wages and prices, the full employment level of output and income will be restored. Finally, even if there is the liquidity trap, the expansion of the money supply will increase money balances and full employment can be restored through the operation of the real balance effect. Thus, absolute prices play a crucial role not only in the money market but also in the real sector of the economy. Patinkin also stated that the equilibrium values of relative prices, the rate of interest and the absolute price level are simultaneously determined by all the markets once the real and monetary data are specified.

Thus, Patinkin removed the classical dichotomy and integrated the monetary and value theory through the real balance effect. He also validates the classical quantity theory. According to Patinkin’s Real Balance effect, people do not suffer from money illusion as they are interested in the real value of their cash holdings. This means that a doubling of the quantity of money will lead to a doubling of the price level, but relative prices and the real balances will remain constant and the equilibrium of the economy will not changed. Thus, Patinkin argued that the classical dichotomy was inconsistent.
The real balance effect is illustrated by using the IS and LM technique in the figure 3.6. We know that IS curve represents the goods market and LM curve represents the money market. Assume that the economy is in equilibrium at OY\(_1\) level of income when the IS and LM curves intersect at point A where the interest rate is Or\(_1\). Assume that full employment level is Y\(_F\) unemployment is Y\(_1\)–Y\(_F\) which causes wages and prices to fall simultaneously. This results in an increase in the real value of people’s money holdings which shifts the LM curve to the right as LM\(_1\). It intersects the IS curve at point B making the level of income OY\(_2\) with the result that the interest rate falls to Or\(_0\), which stimulates investment, discourages savings and increases consumption. Even when the interest rate falls to its minimum level Or\(_0\), the level of demand in the commodity market as represented by the IS curve is not high enough to lead the economy to the full employment level OY\(_F\). Rather unemployment measured by Y\(_2\)–Y\(_F\) remains in the economy. This much unemployment leads to a further fall in wages and prices, and to the increase in demand for consumption goods which shifts the IS curve to the right to IS\(_1\) so that it intersects the LM\(_1\) curve at point C at the full employment level OY\(_F\). Thus, under conditions of wage and price flexibility when the IS and LM curves shift rightwards, the real balance effect ultimately leads the economy to the full employment level, even in the liquidity trap situation as above when investment is interest elastic.

Thus, the real balance effect eliminates the classical dichotomy between value and monetary theory and it also validates the conclusions of the quantity theory of money that
money is neutral and the interest rate is independent of the quantity of money through the real balance effect. It also establishes the wage price flexibility that leads to full employment equilibrium in the long run.

The Criticisms against the Real Balance Effect

The major criticism against the real balance effect came from Harry G Johnson, Archibald and Lipsey and others.

1. Not Applicable in Equilibrium Situations: It is pointed out that there is no need for the real balance effect so long as the real analysis is confined to equilibrium situations. The real balance is needed only to ensure the stability of the price level and not to determine the real equilibrium of the system.

2. Conceptually Inadequate: Archibald and Lipsey regard Patinkin’s analysis of the real balance effect as conceptually inadequate.

3. Price Stability without Real Balance Effect: Patinkin has been criticized for holding the classical view that people do not suffer from money illusion that their behavior is influenced by the real balance effect.
Module III:

Keynesian Macroeconomics

Principle of Effective Demand

In the Keynesian theory of income and employment determination, principle of effective demand occupies a significant place. In the capitalist economy, the level of employment depends upon the level of aggregate effective demand. According to Keynes, effective demand is determined by aggregate supply and aggregate demand. Only that level of demand is effective where aggregate demand and supply are fully matched and entrepreneurs have no tendency either to expand or contract output and employment.

We can now analyse the concepts of aggregate supply and aggregate demand and how their interaction determines the equilibrium level of income and employment.

Aggregate Supply Function

In his General Theory, Keynes relates aggregate supply function to varying levels of employment. It is based on the assumption that labour is the only resource and the only cost which must be covered by the sale proceeds. At any level of employment of labour, aggregate supply price is the total amount of money which all the entrepreneurs in the economy taken together, must expect to receive from the sale of output produced by the given number of labours employed, if it is just worth employing them. Aggregate supply price, at given level of employment, according to Keynes, is the expectation of proceeds which will just make it worthwhile for the entrepreneurs to employ that number of workers. It is the minimum proceeds which the entrepreneurs expect to recover from the sale of output. We can represent aggregate supply function as a schedule of various aggregate supply prices at different levels of employment. That is, each level of employment in the economy is related to a particular aggregate supply price and there are different aggregate supply prices for different levels of employment as shown in the following table.
Table 3.1: Aggregate Supply Price

<table>
<thead>
<tr>
<th>Levels of employment (in lakhs of workers)</th>
<th>Aggregate Supply Price (in crores of Rs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>200</td>
</tr>
<tr>
<td>20</td>
<td>220</td>
</tr>
<tr>
<td>30</td>
<td>240</td>
</tr>
<tr>
<td>40</td>
<td>260</td>
</tr>
<tr>
<td>50</td>
<td>280</td>
</tr>
<tr>
<td>50</td>
<td>300</td>
</tr>
</tbody>
</table>

The table number 3.1 represents varying levels of aggregate supply prices at different levels of employment. It reveals that the aggregate supply price rises with the increase in level of employment. If the entrepreneurs are to provide employment to 20 lakh workers, they must receive Rs 220 crores from the sale of output produced by them. If the level of employment is 40 lakh the aggregate supply price is 260 crores which is the minimum proceeds expected to receive to sustain such level of employment. But when the economy reaches the level of full employment (50 lakh) aggregate supply price continues to increase but there is no further increase in employment. According to Keynes, the aggregate supply function is an increasing function of the level of employment. But when the economy reaches full employment, aggregate supply function becomes perfectly inelastic. Aggregate supply function is linear. But if wage rate also increases along with the expansion in employment, the aggregate supply function follows a nonlinear path as shown below.
The curve of aggregate supply function starts from the point of origin and slopes upwards to the right because as the necessary expected proceeds increase, the level of employment also increases. But when the economy reaches full employment limit, as indicated by Nf, the aggregate supply curve becomes vertical. Even with the increase in aggregate supply price it is not possible to provide more employment as the economy has attained the level of full employment.

**Aggregate Demand Function**

The major analytical tool employed by Keynes in the determination of income and employment is aggregate demand function. According to Keynes, aggregate demand function means the amount of money or proceeds that all the entrepreneurs in the economy taken together expect to receive from the sale of output produced by the given number of workers employed. In other words, aggregate demand price, represents the amount of expenditure actually expected by the entrepreneurs when a given number of workers are employed to produce goods and services. The aggregate demand schedule does not represent any particular or actual level of demand; it is simply the possible level of demand for different categories of goods and services. Thus, aggregate demand is an ex-ante concept. In a two sector economic model consisting of households and business sector, the level of aggregate demand is determined by aggregating the expected expenditures on the consumer goods and services and in the investment goods. Thus, aggregate demand is determined by the consumption demand and investment demand.
The aggregate demand can be expressed as $\text{AD} = C + I$.

As said above, consumption demand depends on disposable income on the one hand, and propensity to consume on the other. According to Keynes, investment is determined by marginal efficiency of capital (MEC) and rate of interest. While rate of interest is more or less sticky, it is the changes in MEC that cause frequent changes in inducement to invest. According to Keynes, the aggregate demand function is an increasing function of the level of employment. Thus we can construct aggregate demand curve showing different aggregate demand prices at different levels of employment. Aggregate demand also rises from left to the right. This is because as the level of employment increases, aggregate demand price also rises, as shown below.

![Effective Demand and Determination of Employment](Image)

**Effective Demand and Determination of Employment**

As said above, aggregate supply curve shows the receipts which must be received by the entrepreneurs so as to provide employment to given number of labourers whereas aggregate demand curve shows proceeds which entrepreneurs actually expects to receive at different levels of employment. These aggregate demand and aggregate supply curves determine the level of employment in the economy. The equilibrium level of employment is determined at the point where demand price aggregate equals the aggregate supply price. In other words, it is the point where what the entrepreneurs ‘expects to receive’ equals what they ‘must receive’
and their profits are maximized. This point is called the effective demand. Effective demand is that aggregate demand price which becomes ‘effective’ because it is equal to aggregate supply price and thus represents short run equilibrium. So long as aggregate demand price is higher than aggregate supply price, the prospects of getting additional profits are greater when more workers are provided employment. The expected proceeds (revenue) rise more than proceeds necessary (cost). This process will continue till the aggregate demand price equals aggregate supply price and the point of effective demand is reached.

It is not necessary that the equilibrium level of employment is always at full employment. Equality between aggregate demand and aggregate supply does not necessarily indicate the full employment level. The economy can be in equilibrium at less than full employment or underemployment equilibrium can exist. The classical economists denied that there would be equilibrium at less than full employment because they believed that supply creates its own demand and therefore deficiency of aggregate demand would not be experienced. Keynes demolished the classical thesis of full employment and point out that deficiency of aggregate demand can cause underemployment equilibrium. The following figure illustrates the principle of effective demand and the determination of equilibrium level of employment.

**Figure 3.3: Effective Demand**

![Figure 3.3: Effective Demand](image)

AD is the aggregate demand function and AS is the aggregate supply function. Aggregate demand curve and aggregate supply curve intersects at point E. This is the effective demand where ON workers are employed. At less than ON level of employment, say at ON1, aggregate demand curve lies above aggregate supply curve showing that it is profitable to
expand the amount of employment. However, it would not be profitable for the entrepreneurs
to increase employment below ON, as AD lies below AS and they incur losses. Thus, E, the
point of effective demand determines actual level of employment in the economy.

It can be noticed that the equilibrium at E represents underemployment or less than full
employment level. At equilibrium level of employment ON, the N N₂ persons remain
unemployed. It is important to note that N N₂ persons are involuntarily unemployed. They are
willing to work at the existing wage rates but are unable to find jobs. This unemployment is
due to deficiency of aggregate demand. It follows that, to raise the economy to the level of
full employment, requires the raising the point of effective demand by increasing the
aggregate demand. The unemployment will be removed and full employment will be reached
if through increase in investment demand or increase in consumption demand or both,
aggregate demand curve shifts upwards so that it intersects aggregate supply curve at point R.
With the intersection of aggregate demand and aggregate supply at point F, equilibrium will
be stabled at full employment level ON₂.

**Keynesian Two Sector Model**
As said above, Keynesian theory deals with short run and Keynesian theory of income
determination can be explained by assuming only two sectors in the economy, namely
households and business firms. It is a closed economy in which there are no exports and
imports. Keynes focused on this simple two sector model for determination of income and
derived conclusions regarding policy formulations from this basic model. In the two sector
model, only consumption and investment expenditure takes place. Thus total output of the
economy is the sum of is the sum of consumption and investment expenditures. Because
there is no government in this economy, national income equals net national product. Again,
because there is no government, there can be no taxes and all personal income becomes
disposable personal income. In this economy, disposable personal income also equals net
national product. Disposable personal income must be devoted either to personal
consumption expenditures or to personal savings. Because disposable personal income equals
net national product, personal savings must then equal investment. Thus we have the
following identities.

\[
\text{NNP (Y)} = \text{C + I}
\]

\[
\text{Disposable Personal income (Yd) = C + S}
\]
\[ Y = Y_d \]

Therefore \( S = I \)

These are fundamental accounting identities with which we will work in the two sector model

**Equilibrium, Income and Output**

The equilibrium level of income and output is determined at the point where the aggregate demand function intersects aggregate supply function. In the two sector economy, aggregate demand consist of consumption demand and investment demand \((Y = C+I)\). In drawing aggregate supply, not only stock of capital, size of population, state of technology, average and marginal product of labour and money wages are assumed to remain constant but also price level of output is held constant. This type of aggregate supply curve \((Y = C+S)\) can be shown as 45° line starting from the point of origin. The following figure depicts the equilibrium level of income and output in the two sector model.

Figure 3.4: Equilibrium Level of Income and Output, Two Sector
In the figure, aggregate demand function is represented by \( C + I \) drawn by adding consumption 45\(^0\) function (C) and investment demand (I). The line represents the aggregate supply function \( Y = C+S \). The aggregate demand function and aggregate supply function intersects at point E and equilibrium level income 0\(Y_0\) is determined. Now income cannot be in equilibrium at levels smaller than 0\(Y_0\), say at 45\(^0\) 0\(Y_1\).

This is because at 0\(Y_1\), aggregate demand exceeds aggregate supply since C+I curve lies above line. This excess demand will lead to the decline in inventories which induce firms to expand their output of goods and services to meet the extra demand for them. Income will continue to increase till 0\(Y_0\) is reached. On the contrary, at levels of income greater than the equilibrium level, say at 0\(Y_2\), aggregate demand fall short of aggregate supply. This will cause unintended increase in inventories of goods with the firm. The firms will respond by cutting down production. This will lead to a fall in income until the level 0\(Y_0\) is reached where aggregate demand is equal to the aggregate supply.

The equilibrium may also be defined as that level of income at which planned saving equals planned investment. In part B of the figure, I is autonomous investment function and S is saving function. The saving and investment function intersects at point E which determines the equilibrium level of income 0\(Y_0\). At 0\(Y_0\), planned saving is equal to planned investment. At 0\(Y_1\), planned investment by the entrepreneurs is more than planned savings by the people. This would mean that aggregate demand is greater than aggregate supply of output. This will lead to decline in inventories and firms will increase production, raising the level of income and employment. On the other hand, at 0\(Y_0\), investment is less than savings. It means that aggregate demand is less than aggregate supply. As a result, the entrepreneurs will not be able to sell their entire output at given prices. The result will be that output will be reduced which will results in reduction in income.

**Keynesian Three Sector Model**

In the above analysis of two sector model, we explained how equilibrium level of income is determined by the consumption function and autonomous investment demand. We can construct a three sector model by adding government sector to the two sector simple economy model. Even though government influences the economy in a variety of ways, Keynesian three sector model confines to the effects of government’s expenditure (G) and taxation (T). Thus, GNP identity for the three sector model, we have \( AD = C+I+G \) and \( AS = C+S+T \). The
Keynesian condition for equilibrium in a three sector model may now be written as \( C + S + T = C + I + G \). Expressed in terms of saving and investment, equilibrium will be found at that level of income at which saving plus taxes equals planned investment plus government expenditure.

\[ S + T = I + G \]

The determination of equilibrium level of income in a three sector model is graphically shown below.

Figure 3.5: Equilibrium Level of Income and Output, Three Sector

C is the consumption function curve to which we have added the autonomous investment (I) and government expenditure (G) to get aggregate demand curve \( C + I + G \). with this, equilibrium level of \( 45^\circ \) income is determined at 0Y at which aggregate demand curve intersects line of aggregate supply. If the income is less than 0Y, aggregate demand exceeds aggregate supply. This implies unintended decline in inventories of goods which will induce firms to expand aggregate output to the level of 0Y. On the contrary, at level of income greater than 0Y, aggregate demand is less than aggregate supply. This deficiency of demand
for demand for goods will cause unintended accumulation of inventories. The firms would respond to this by cutting back production of goods which will lead to the reduction of income to the equilibrium level 0Y.

**Keynesian Consumption function**
Consumption function refers to the functional or causal relationships between consumption on the one hand and the various factors determining it on the other. Your income is considered to be the chief determinant of your consumption, so the consumption function conventionally refers to the functional relationship between income and consumption. The relationship between income and consumption has always been a subject of intense study ever since Ernst Ergel, a German statistician, formulated the “laws of consumption expenditure in 1857”. On the basis of statistical data pertaining to the consumption expenditures of the sample of German households, Angel formulated a set of three generalisations which are popularly known as “Engel’s laws of consumption”. Engel’s laws may be stated as follows: As the level of income increases, households tend to spend: a decreasing percentage of income on food, an increasing proportion of income on things such as education, medical facilities, recreation, etc. roughly a constant proportion of income on essential consumption items such as rent, fuel, clothing and lighting.

These generalisations broadly hold from the basis of the law of consumption or propensity to consume subsequently formulated by J M Keynes. Keynes was the first to stress the importance of the relationship between income and consumption and to make it one of the central parts of Macro Economics.

**Concept of Consumption Function**
The consumption function – the relationship between consumption and income – is largely a Keynesian contribution. Keynes postulated that consumption depends mainly on income. In regard to the relationship, he argued that consumption increases as income increases but by an amount less than the increase in income. It is, however, assumed that by income Keynes
meant the “disposable income of the consumer”. Keynes designated tendency of consumption varying directly with disposable income as the Fundamental Psychological Law. According to this law, “men are disposed, as a rule and on the average, to increase their consumption as their income increases but not by as much as the increase in their income. This law is known as propensity to consume or consumption function”.

This law consists of three propositions:

1. When aggregate income increases, consumption expenditure also increases but by a somewhat smaller amount. The reason is that as income increases, more and more of our wants get satisfied and therefore lesser and lesser amounts are spent out of subsequent increases in income.

2. When income increases, the increment of income will be divided in a certain proportion between consumption and saving. This follows from the first proposition that what is not spent is saved.

3. As income increases both consumption spending and saving will go up.

Assumptions of the Law

1. It is assumed that habits of people regarding spending do not change or propensity to consume remains the same. Normally, the propensity to consume is more or less stable and does remain unchanged. This assumption implies that only income changes whereas other factors like income distribution, price movement, growth of population, etc. remain more or less constant.

2. The conditions are normal in the economic system.

3. The existence of a capitalistic laissez faire economy. The law may not hold good in an economy where state interferes with consumption or productive enterprise.

Explanation of the Law

The most important determinant of consumption is income. In technical language consumption is a function of (determined by) income. This relationship between consumption and income is termed as “consumption function” or “the propensity to consume”.
\[ C = f(Y) \]

Where, \( C \) is consumption

\( f \) is function

\( Y \) is income

**Propensity to Consume**

Keynes has made use of four concepts in analysing consumption-income relationship. These are:

1. Average propensity to consume
2. Marginal propensity to consume
3. Average propensity to save
4. Marginal propensity to save

Consider the following data of a hypothetical economy.

Columns 1 and 2 in below table indicate the amount of consumption expenditures of this society at various income levels. In this schedule, just as demand curve shows the purchases that will be made at different prices. Column 3 shows the savings of the society at various income levels. This example shows that this society begins to make positive savings only when it reaches an income of 250.

**Table 3.2: Data of a Hypothetical Economy**

<table>
<thead>
<tr>
<th>( Y ) (Income)</th>
<th>( C ) (Consumption)</th>
<th>( S ) (Savings)</th>
<th>APC</th>
<th>MPC</th>
<th>APS</th>
<th>MPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>60</td>
<td>-60</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>100</td>
<td>150</td>
<td>-50</td>
<td>1.5</td>
<td>90</td>
<td>-0.5</td>
<td>10</td>
</tr>
<tr>
<td>200</td>
<td>220</td>
<td>-20</td>
<td>1.1</td>
<td>0.70</td>
<td>0.1</td>
<td>0.30</td>
</tr>
<tr>
<td>250</td>
<td>250</td>
<td>0</td>
<td>1</td>
<td>0.30</td>
<td>0</td>
<td>0.70</td>
</tr>
<tr>
<td>350</td>
<td>300</td>
<td>50</td>
<td>0.89</td>
<td>0.50</td>
<td>0.11</td>
<td>0.50</td>
</tr>
<tr>
<td>450</td>
<td>345</td>
<td>105</td>
<td>0.77</td>
<td>0.45</td>
<td>0.23</td>
<td>0.55</td>
</tr>
</tbody>
</table>
The above numerical example has been presented diagrammatically in the following figure where the horizontal axis measures income and the vertical axis measures consumption expenditures. The consumption function indicating the consumption expenditures at various income levels is shown by the line CC. Draw a 45° line through the origin. Every point on this line is equidistant from the two axes. The difference between the 45° line and consumption function measures planned saving at each income level of 25°, consumption exceeds income resulting in negative savings. Beyond that income there are positive savings. Part B draws the saving-function as corresponding to the consumption function CC in Part A.

Figure 3.6: Consumption-Income Relationship

As the level of income increases, households generally increase consumption expenditure but less than proportionally. On the contrary when the level of income decreases households are constrained to reduce consumption, but by a smaller amount. The reason for this ‘tendency’ or ‘propensity’ is not far to seek. The satisfaction of the immediate basic needs of households is usually a stronger motive than the motive toward accumulation. Hence, at lower income levels, households are constrained to spend almost the entire income and sometimes spend more than the income on the consumption needs.
As a result, saving, which is the difference between income and consumption, tends to be either “zero” or even “negative”. Negative saving is also called dissaving, which means that at low incomes households may have to use up their past savings or borrow in order to keep their consumption expenditure in excess of their income. But as the income level rises, since most of the basic consumption needs are satisfied, the households do not find it essential to increase the consumption expenditure in the same proportion. As a result, savings tend to rise more than proportionately when income rises. Since saving is the difference between income and consumption and since consumption depends on income it follows that saving also depends on income. This relationship between saving and income is called the “propensity to save” or the “saving function”. The nature of relationship between the disposable household income on the one hand and the household consumption and saving on the other can be explained with the help of a simple linear equation (as stated earlier):

\[ Y = C + S \]

Where,

\[ Y \] is disposable income

\[ C \] is consumption

\[ S \] is saving
This equation says that a household, disposable income is partly consumed and partly saved. The income-consumption relationship can be specified by the equation:

$$C = a + b.Y \ (a>0, \ 0<b<1)$$

Where ‘a’ is autonomous consumption and ‘b.Y’ is induced consumption. So, the equation says that the consumption of a household comprises autonomous consumption and induced consumption. Autonomous consumption is constant and is determined independently of income. This may be considered as the “critical maximum consumption” or the “basic minimum need” of a household that should be met by it irrespective of the household income. Induced consumption is the consumption induced or generated by income and hence it is a positive function of income. The parameter ‘b’ in the term ‘b.Y’ is the rate at which induced consumption changes when there is a change in income. It is otherwise called the “marginal propensity to consume” or MPC and it is the slope of the consumption function. If Y denotes a change in income and C denotes the change in consumption associated with the change in income, b, the MPC equals $C/ Y \ [MPC/ \ (b) = C/ Y]$ and the value of b MPC changes between 0 and 1 (0<b <1).

Example: If b = 0.8, it means that a Rs. 100 rise in disposable income leads to Rs. 80 rise in consumption.

Savings function can be derived as

$$Y = C+S$$

$$S = Y-C$$

$$= Y - (a + bY)$$

$$= Y-a- bY$$

$$S = -a + (1-b).Y \ \{0<(1-b)<1\}$$

Where, S and Y represent real saving and real income, respectively.

The parameter (1-b) referred to as the “marginal propensity to save” or MPS is the slope of the saving function. If Y denotes change in income and S denotes change in saving associated
with the change in income, (1-b), MPS = \(\frac{S}{Y}\) is (1-b) = \(\frac{S}{Y}\) and its value ranges between 0 and 1.

Example: If the marginal propensity to consume is 0.8, the marginal propensity to save is 0.2. This means that a 100 rise in income leads to 20 rise in saving; obviously,

\[
MPC + MPS = 1.
\]

Two other important concepts used by Keynes to explain the income-consumption and income saving relationships are the Average Propensity to Consume (APC) and the average propensity to save (APS). The average propensity to consume (APC) is the ratio of consumption to income, i.e., \(APC = \frac{C}{Y}\)

While the APS is the ratio of savings to income, i.e., \(APS = \frac{S}{Y}\)

The APC tells us the proportion of each income level that a household will spend on consumption. Similarly, the APS tells us the proportion of each income level that the household will save, i.e., not spend on consumption.

Note that as income rises, the APC decreases while the APS increases.

Note also that APC and APS add up to 1, i.e., \(APC + APS = 1\)

The foregoing relationships can be illustrated with the help of a numerical example. Suppose the consumption function for a household is given by the equation \(C = 1000 + 0.8Y\). This means that autonomous consumption of the household is Rs. 1000 and the induced consumption rises at the rate of 80 per cent for every increment in income. The following table shows how the consumption, savings, APC and APS change as income changes. It may be observed from the table that at income levels below Rs. 5000, consumption exceeds income and, hence, saving is negative. From this one can understand that at lower income levels households tend to consume more than they earn. In other words, they find their incomes rather too low to meet their consumption needs. As a result, low income households are constrained to dissave, i.e., to meet the excess of consumption over income through borrowing or using up the past savings.
Table 3.3: A Household’s Consumption and Savings Schedule

(Consumption Function: C=1000 + 0.8 Y)

<table>
<thead>
<tr>
<th>Disposable Income (Rs.)</th>
<th>Autonomous Consumption (Rs.)</th>
<th>Induced Consumption (Rs.)</th>
<th>Total Consumption (Rs.)</th>
<th>Savings (Rs.)</th>
<th>APC</th>
<th>APS</th>
</tr>
</thead>
<tbody>
<tr>
<td>3000</td>
<td>1000</td>
<td>2400</td>
<td>3400</td>
<td>-400</td>
<td>1.13</td>
<td>-0.13</td>
</tr>
<tr>
<td>4000</td>
<td>1000</td>
<td>3200</td>
<td>4200</td>
<td>-200</td>
<td>1.05</td>
<td>-0.05</td>
</tr>
<tr>
<td>5000</td>
<td>1000</td>
<td>4000</td>
<td>5000</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>6000</td>
<td>1000</td>
<td>4800</td>
<td>5800</td>
<td>200</td>
<td>0.97</td>
<td>0.03</td>
</tr>
<tr>
<td>7000</td>
<td>1000</td>
<td>5600</td>
<td>6600</td>
<td>400</td>
<td>0.94</td>
<td>0.06</td>
</tr>
<tr>
<td>8000</td>
<td>1000</td>
<td>6400</td>
<td>7400</td>
<td>600</td>
<td>0.93</td>
<td>0.07</td>
</tr>
<tr>
<td>9000</td>
<td>1000</td>
<td>7200</td>
<td>8200</td>
<td>800</td>
<td>0.91</td>
<td>0.09</td>
</tr>
<tr>
<td>10000</td>
<td>1000</td>
<td>8000</td>
<td>9000</td>
<td>1000</td>
<td>0.90</td>
<td>0.10</td>
</tr>
</tbody>
</table>

As the table also reveals, households with income levels above 5000 are able to save since their consumption needs are fully satisfied by these income levels. The consumption function analysed above is basically derived from the relationship expressed by the household’s “propensity to consume”. This fundamental law states, as learned above, that as income increases, consumption increases but not as fast as income. When a consumption function is derived from actual data, however, it may not turn out exactly as expected. This is because various theoretical and statistical problems are encountered along the way.
Figure 3.8: Consumption Saving Curve

Short run analysis based on family budget studies covering a large sample or cross-section of households conclude that

- Savings tend to be negative at low levels of income,
- The APC decreases as income increases, and
- The MPC probably decreases as income increases, although the decline may be relatively slight depending on other factors, especially the distribution of income among households.

This suggests that the short run consumption function of the economy is best represented by equation $C = a + bY$ yielding a consumption curve with a vertical intercept and a slope (i.e., b) less than that of the 45° diagonal. This means that in a short period, say a year, the APC tends to be greater than the MPC. On the contrary, long run studies based on historical or time-series data covering many years have concluded that both the APC and MPC tend to remain constant and equal as income rises. This suggests that in the long run consumption function, the autonomous consumption tends to disappear and all the consumption turns out to be induced consumption. Thus in the long run $C = bY$. The consumption curve representing long run income consumption relationships in the economy tends to be a range from the origin and runs close to the 45° diagonal.
Absolute Income Hypothesis

Keynes and his early followers placed primary emphasis on the influence of a household’s absolute level of income on its consumption. Keynes assumed that the consumption expenditure of an individual or a household depended solely on the absolute level of his income. The resulting theory of consumption later become known as the absolute income hypothesis, named because the theory explicitly assumes that consumption is the function of either a household’s or a nation’s absolute income. The consumption function is based on the assumption that the absolute income hypothesis is linear; the MPC is therefore constant but less than the APC, because the intercept is a positive term and the APC diminishes as disposable income increases. This is the essence of the absolute income hypothesis. The post-Keynesian studies on consumption function have attempted to distinguish between the short run consumption function and long run consumption function and found that most of the postulates of Keynes consumption function hold good in the short run only and not in the long run.

Investment Function

In Keynesian theories investment has been treated as the most volatile and strategic variable in all macroeconomic models. The investment expenditure not only affects the level of aggregate demand but also determines the productive capacity of the economy. Investment plays a crucial role in the determination of short run fluctuations in income or output and determination of the long term growth path of the economy. In the general sense of the term, investment means using or spending money on acquiring physical or financial asset and skills that yield a return over time. In Keynesian terminology, investment refers to real investment which adds to capital equipments. Real investment includes expenditures on new plant and machinery, construction of public works like roads, dams, buildings etc that creates income and employment. Thus, real investment means the addition to the stock of physical capital.

(i) Gross and Net investment

Gross investment is the flows of expenditure spend on new fixed capital goods or addition to the stock of raw materials and unsold consumer goods etc during an year. But some capital stock wears out every year and is used up for depreciation and obsolescence. Net investment is gross investment minus depreciation and obsolescence charges (or replacement
investment). It is net addition to the existing capital stock of the economy. Thus, net investment is used to denote capital formation.

(ii) Induced and Autonomous investment

The investment expenditure which is related with the current income, output or interest rates is termed as induced investment. Induced investment is affected by changes in the level of income. When income increases, consumption demand also increases and to meet this investment increases. Keynes regarded rate of interest as a factor determining induced investment. Thus, general form of investment function is given by \( I = f(Y, i) \) where \( Y \) is income and \( i \) is the rate of interest. But empirical evidence suggests that induced investment depend more on income than on the rate of interest. The following figure shows induced investment, where it can be seen that with the increase in income, induced investment also increases.

![Figure 3.9: Induced Investment](image)

Autonomous investment refers to the investment which does not depend upon the changes in the income level. It is independent or autonomous of the level of income and is thus income inelastic. Changes in autonomous investment are caused by exogenous factors rather than the change in income or interest rate. These exogenous factors include technological innovations or inventions like introduction of new product into the market, growth of population and labour force, changes in the social and legal institutions, future expectations, war, revolutions etc. Most of the investment undertaken by the governments is autonomous in nature. These include expenditure on economic and social overheads like expenditure on roads, dams, schools, hospitals, power, communication etc. The autonomous investment is depicted in the following figure where it can be seen that whatever the level of income, investment remains
the same at Ir. Thus, autonomous investment is shown as a curve parallel to the horizontal axis.

3.10: Autonomous Investment

3.10: Autonomous Investment

Determinants of Investment

There are three important elements involved that determines the level of aggregate investment expenditure in any time period. They are expected income flow from project, the cost of the project and the market rate of interest. In Keynes’s theory of investment he sums up these factors in the concepts of Marginal Efficiency of Capital (MEC) and Marginal Efficiency of Investment (MEI).

Marginal Efficiency of Capital

The marginal Efficiency of Capital (MEC) is the highest rate of return expected from an additional or marginal unit of a capital asset over its cost. In general terms, MEC may be defined as the highest return over the cost expected from producing an additional unit of the most profitable of all categories of the capital asset. To estimate the MEC, the entrepreneur will take into consideration how much he has to pay for the particular capital asset. The price which he has to pay for the particular capital asset is called the supply price of capital. The second thing which the entrepreneur will consider is that how many yields he expects to obtain from investment from that capital asset. He has to estimate the prospective yield from a capital asset over its life period. Thus the supply price and prospective yield of a capital asset determine the MEC. K. K. Kurihara points out that MEC is the ratio between the prospective yield of additional capital goods and their supply price. Algebraically, it may be stated as \( i = \frac{y}{p} \) where, ‘i’ is MEC, ‘y’ is the prospective yield of capital asset per unit of time and ‘p’ is the supply price.
If the annual yield over a series of years is Rs 5000 and the supply price of the capital asset is Rs 40000, then \( i = \frac{y}{p} = \frac{5000}{40000} \times 100 = 12.5\% \). An increase in the prospective yield \( y \) will raise MEC. On the contrary, an increase or decrease in the supply price \( p \) of the capital asset, given the expected yield, will reduce or raise the MEC \( (i) \). Thus, ‘i’ is directly related to the prospective yield and inversely related to the supply price of the capital asset.

In a more generalized sense, Keynes has defined MEC as the rate of discount which would make the present value of the series of annuities given by the returns expected from the capital asset during its life just equal to its supply price. Thus, according to Keynes, MEC is the rate of discount which renders the prospective yields from a capital asset over its life period equal to the supply price of that asset.

Therefore, MEC can be obtained as

\[
C = \frac{R_1}{1+i} + \frac{R_2}{(1+i)^2} + \frac{R_3}{(1+i)^3} + \ldots + \frac{R_n}{(1+i)^n}
\]

In the formula, \( C \) stands for the supply price of the capital asset, \( R_1, R_2, R_3 \ldots R_n \) represents the series of prospective yields whose present worth is computed by discounting them at a certain rate such that the sum of the discounted prospective yields becomes equal to the supply price of the capital asset and \( i \) is the rate of discount or MEC. Suppose that the supply price of the capital asset which yields return for two years is Rs 1000. The expected yield for two years is Rs 550 and Rs 605. Then, by solving we will get the unique rate of discount or MEC which equates the discounted prospective yields with the supply price as 10\%. That is,

\[
C = \frac{R_1}{1+i} + \frac{R_2}{(1+i)^2}
\]

\[
C = \frac{550}{1 + \frac{10}{100}} + \frac{605}{(1 + \frac{10}{100})^2}
\]

The entrepreneurs can compute MEC for any capital good once he gets its cost and stream of income expected from it. By comparing the MEC with the current market rate of interest he can find out whether the contemplated investment is profitable or unprofitable. In the above illustration, we found MEC to be 10\%. If the interest rate is 9\%, then the investment would be profitable. But if the interest rate is 11\%, it would be considered unprofitable. The MEC
will vary when more is invested in a given particular capital asset. In any given period of time, the MEC from every capital asset will decline as more investment is undertaken in it. The main reason for the decline in investment with the increase in investment is that the prospective yield from capital asset falls as more units are installed and used for the production of the good. The second reason for the decline in the MEC is that the supply price of the capital asset may rise due to the increase in demand for it. Thus, we can represent MEC as a curve which will slope downwards. The MEC curve is depicted below.

3.11: MEC Curve

In the figure, as capital stock increases the MEC falls. It can be seen that when capital stock is 4, the MEC is 8%. As capital stock increases to 10 MEC falls to 4%.

The major causes of decline in MEC are:
1. Reduction in prospective yield
2. Increase in supply price of capital.

The two most important determinants of investment are MEC and rate of interest. As long as MEC exceeds rate of interest, investment will be forthcoming till such a time when these two variables are equal. This will determine the equilibrium volume of investment

**Marginal Efficiency of Investment**

The concept of marginal efficiency of investment (MEI) is the general form of Keynes's concept of marginal efficiency of capital. MEI is the rate of return expected from a given investment on a capital asset after covering all its cost except the rate of interest. Like the MEC, it is the rate which equates the supply price of a capital asset to its prospective yield.
That is, MEI is the unique rate of discount which can equate the present value of the expected returns from the given investment to the cost of financing that project. It can be expressed as

\[ C = \frac{R_1}{1 + d} + \frac{R_2}{(1 + d)^2} + \frac{R_3}{(1 + d)^3} + \ldots \ldots + \frac{R_n}{(1 + d)^n} \]

Here, \( R_1, R_2 \ldots R_n \) are the expected yield or returns from the given investment. \( C \) is the cost of borrowing or cost of financing the given investment project. ‘d’ is MEI which is the rate of discount that equates the sum of discounted value of prospective yield to \( C \). Given \( C \), MEI varies directly with the expected returns and vice versa. Given the expected returns, MEI varies inversely with \( C \) with vice versa. MEI is very important in the ranking of the investment choices. Higher the MEI, higher will be the rank of the investment projects.

MEI schedule expresses the functional relationship between different rates of interest and corresponding amounts of investment, when MEC is given. If the rate of interest is high, investment is at low level. A low rate of interest leads to increase in investment. Thus, MEI schedule that relates investment to the rate of interest is also called investment demand schedule. As MEI schedule depicts an inverse relation between rate of interest and amount of investment, it slopes downwards from left to the right as shown below

Figure 3.12: MEI

In the figure, investment (I) or change in capital stock is measured in horizontal axis and the rate of interest is measured on vertical axis. MEI curve has a negative slope. It shows that a
fall in the rate of interest from $i_2$ to $i$ and $i_1$ leads to a rise in investment from $I_2$ to $I$ and $I_1$ respectively. While MEC schedule represents the investment demand of individual firms in relation to the market rate of interest, MEI schedule represents the investment demand by all the firms. This makes the demand for capital in the economy as a whole. The MEI schedule is represented by the investment function $I = f(i)$.

**Wage and Price Stickiness**

Keynes also pointed out that although AD fluctuated, prices and wages did not immediately respond as economists often expected. Instead, prices and wages are “sticky,” making it difficult to restore the economy to full employment and potential GDP. Keynes emphasized one particular reason why wages were sticky: the coordination argument. This argument points out that, even if most people would be willing—at least hypothetically—to see a decline in their own wages in bad economic times as long as everyone else also experienced such a decline, a market-oriented economy has no obvious way to implement a plan of coordinated wage reductions. Unemployment proposed a number of reasons why wages might be sticky downward, most of which center on the argument that businesses avoid wage cuts because they may in one way or another depress morale and hurt the productivity of the existing workers.

Some modern economists have argued in a Keynesian spirit that, along with wages, other prices may be sticky, too. Many firms do not change their prices every day or even every month. When a firm considers changing prices, it must consider two sets of costs. First, changing prices uses company resources: managers must analyze the competition and market demand and decide the new prices, they must update sales materials, change billing records, and redo product and price labels. Second, frequent price changes may leave customers confused or angry—especially if they discover that a product now costs more than they expected. These costs of changing prices are called menu costs—like the costs of printing a new set of menus with different prices in a restaurant. Prices do respond to forces of supply and demand, but from a macroeconomic perspective, the process of changing all prices throughout the economy takes time.

To understand the effect of sticky wages and prices in the economy, consider Figure (a) illustrating the overall labour market, while Figure (b) illustrates a market for a specific good or service. The original equilibrium (E0) in each market occurs at the intersection of the
demand curve (D0) and supply curve (S0). When aggregate demand declines, the demand for labour shifts to the left (to D1) in Figure (a), and the demand for goods shifts to the left (to D1) in Figure (b). However, because of sticky wages and prices, the wage remains at its original level (W0) for a period of time and the price remains at its original level (P0). As a result, a situation of excess supply—where the quantity supplied exceeds the quantity demanded at the existing wage or price—exists in markets for both labour and goods, and Q1 is less than Q0 in both Figure (a) and Figure (b). When many labour markets and many goods markets all across the economy find themselves in this position, the economy is in a recession; that is, firms cannot sell what they wish to produce at the existing market price and do not wish to hire all who are willing to work at the existing market wage.

Figure 3.13: Effect of Sticky Wages and Prices

The Two Keynesian Assumptions in the AD/AS Model

The following figure is the AD/AS diagram which illustrates these two Keynesian assumptions—the importance of aggregate demand in causing recession and the stickiness of wages and prices. Note that because of the stickiness of wages and prices, the aggregate supply curve is flatter than either supply curve (labour or specific good). In fact, if wages and prices were so sticky that they did not fall at all, the aggregate supply curve would be completely flat below potential GDP, as the figure shows. This outcome is an important example of a macroeconomic externality, where what happens at the macro level is different from and inferior to what happens at the micro level. For example, a firm should respond to a decrease in demand for its product by cutting its price to increase sales. However, if all firms
experience a decrease in demand for their products, sticky prices in the aggregate prevent aggregate demand from rebounding (which we would show as a movement along the AD curve in response to a lower price level).

Figure 3.14: AD and AS

The original equilibrium of this economy occurs where the aggregate demand function (AD0) intersects with AS. Since this intersection occurs at potential GDP (Yp), the economy is operating at full employment. When aggregate demand shifts to the left all the adjustment occurs through decreased real GDP. There is no decrease in the price level. Since the equilibrium occurs at Y1, the economy experiences substantial unemployment.

The Keynesian Cross model or Expenditure-Output Model

The fundamental ideas of Keynesian economics were developed before the AD/AS model was popularized. From the 1930s until the 1970s, Keynesian economics was usually explained with a different model, known as the expenditure-output approach. This approach is strongly rooted in the fundamental assumptions of Keynesian economics: it focuses on the total amount of spending in the economy, with no explicit mention of aggregate supply or of the price level.

The expenditure-output model, sometimes also called the Keynesian cross diagram, determines the equilibrium level of real GDP by the point where the total or aggregate expenditures in the economy are equal to the amount of output produced. The axes of the Keynesian cross diagram presented in Figure B1 show real GDP on the horizontal axis as a measure of output and aggregate expenditures on the vertical axis as a measure of spending.
Figure 3.15: Keynesian Cross

The aggregate expenditure-output model shows aggregate expenditures on the vertical axis and real GDP on the horizontal axis. A vertical line shows potential GDP where full employment occurs. The 45-degree line shows all points where aggregate expenditures and output are equal. The aggregate expenditure schedule shows how total spending or aggregate expenditure increases as output or real GDP rises. The intersection of the aggregate expenditure schedule and the 45-degree line will be the equilibrium. Equilibrium occurs at E0, where aggregate expenditure $AE_0$ is equal to the output level $Y_0$.

Remember that GDP can be thought of in several equivalent ways: it measures both the value of spending on final goods and also the value of the production of final goods. All sales of the final goods and services that make up GDP will eventually end up as income for workers, for managers, and for investors and owners of firms. The sum of all the income received for contributing resources to GDP is called national income ($Y$). At some points in the discussion that follows, it will be useful to refer to real GDP as “national income.” Both axes are measured in real (inflation adjusted) terms.

The Potential GDP Line and the 45-degree Line
The Keynesian cross diagram contains two lines that serve as conceptual guideposts to orient the discussion. The first is a vertical line showing the level of potential GDP. Potential GDP means the same thing here that it means in the AD/AS diagrams: it refers to the quantity of output that the economy can produce with full employment of its labour and physical capital. The second conceptual line on the Keynesian cross diagram is the 45-degree line, which starts at the origin and reaches up and to the right. A line that stretches up at a 45-degree angle represents the set of points $(1, 1)$, $(2, 2)$, $(3, 3)$ and so on, where the measurement on the vertical axis is equal to the measurement on the horizontal axis. In this diagram, the 45-degree line shows the set of points where the level of aggregate expenditure in the economy, measured on the vertical axis, is equal to the level of output or national income in the economy, measured by GDP on the horizontal axis. When the macro economy is in equilibrium, it must be true that the aggregate expenditures in the economy are equal to the real GDP—because by definition, GDP is the measure of what is spent on final sales of goods and services in the economy. Thus, the equilibrium calculated with a Keynesian cross diagram will always end up where aggregate expenditure and output are equal—which will only occur along the 45-degree line.

The Aggregate Expenditure Schedule

The final ingredient of the Keynesian cross or expenditure-output diagram is the aggregate expenditure schedule, which will show the total expenditures in the economy for each level of real GDP. The intersection of the aggregate expenditure line with the 45-degree line will show the equilibrium for the economy, because it is the point where aggregate expenditure is equal to output or real GDP. After developing an understanding of what the aggregate expenditures schedule means, we will return to this equilibrium and how to interpret it.

Building the Aggregate Expenditure Schedule

Aggregate expenditure is the key to the expenditure-income model. The aggregate expenditure schedule shows, either in the form of a table or a graph, how aggregate expenditures in the economy rise as real GDP or national income rises. Thus, in thinking about the components of the aggregate expenditure line—consumption, investment, government spending, exports and imports—the key question is how expenditures in each category will adjust as national income rises.
Consumption as a Function of National Income

How do consumption expenditures increase as national income rises? People can do two things with their income: consume it or save it (for the moment, let’s ignore the need to pay taxes with some of it). Each person who receives an additional dollar faces this choice. The marginal propensity to consume (MPC), is the share of the additional dollar of income a person decides to devote to consumption expenditures. The marginal propensity to save (MPS) is the share of the additional dollar a person decides to save. It must always hold true that:

\[\text{MPC} + \text{MPS} = 1\]

For example, if the marginal propensity to consume out of the marginal amount of income earned is 0.9, then the marginal propensity to save is 0.1.

With this relationship in mind, consider the relationship among income, consumption, and savings shown in Figure. An assumption commonly made in this model is that even if income were zero, people would have to consume something. In this example, consumption would be Rs.600 even if income were zero. When income increases by Rs.1,000, consumption rises by Rs.800 and savings rises by Rs.200. Then, the MPC is 0.8 and the MPS is 0.2. At an income of Rs.4,000, total consumption will be the Rs.600 that would be consumed even without any income, plus Rs.4,000 multiplied by the marginal propensity to consume of 0.8, or Rs. 3,200, for a total of Rs. 3,800. The total amount of consumption and saving must always add up to the total amount of income. (Exactly how a situation of zero income and negative savings would work in practice is not important, because even low-income societies are not literally at zero income, so the point is hypothetical.) This relationship between income and consumption is illustrated in the following figure.
Equilibrium in the Keynesian Cross Model

With the aggregate expenditure line in place, the next step is to relate it to the two other elements of the Keynesian cross diagram. Thus, the first subsection interprets the intersection of the aggregate expenditure function and the 45-degree line, while the next subsection relates this point of intersection to the potential GDP line.

The point where the aggregate expenditure line that is constructed from \( C + I + G + X - M \) crosses the 45-degree line will be the equilibrium for the economy. It is the only point on the aggregate expenditure line where the total amount being spent on aggregate demand equals the total level of production. In the following figure, this point of equilibrium (E0) happens at 6,000. The meaning of “equilibrium” remains the same; that is, equilibrium is a point of balance where no incentive exists to shift away from that outcome. To understand why the point of intersection between the aggregate expenditure function and the 45-degree line is a macroeconomic equilibrium, consider what would happen if an economy found itself to the right of the equilibrium point E, where output is higher than the equilibrium. At point H, the level of aggregate expenditure is below the 45-degree line, so that the level of aggregate expenditure in the economy is less than the level of output. As a result, at point H, output is piling up unsold—not a sustainable state of affairs.
If output was above the equilibrium level, at H, then the real output is greater than the aggregate expenditure in the economy. This pattern cannot hold, because it would mean that goods are produced but piling up unsold. If output was below the equilibrium level at L, then aggregate expenditure would be greater than output. This pattern cannot hold either, because it would mean that spending exceeds the number of goods being produced. Only point E can be at equilibrium, where output, or national income and aggregate expenditure, are equal. The equilibrium (E) must lie on the 45-degree line, which is the set of points where national income and aggregate expenditure are equal. Conversely, consider the situation where the level of output is at point L—where real output is lower than the equilibrium. In that case, the level of aggregate demand in the economy is above the 45-degree line, indicating that the level of aggregate expenditure in the economy is greater than the level of output. When the level of aggregate demand has emptied the store shelves, it cannot be sustained, either. Firms will respond by increasing their level of production. Thus, the equilibrium must be the point where the amount produced and the amounts spent are in balance, at the intersection of the aggregate expenditure function and the 45-degree line.

**Recessionary and Inflationary Gaps**
In the Keynesian cross diagram, if the aggregate expenditure line intersects the 45-degree line at the level of potential GDP, then the economy is in sound shape. There is no recession, and unemployment is low. But there is no guarantee that the equilibrium will occur at the potential GDP level of output. The equilibrium might be higher or lower.

For example, Figure (a) illustrates a situation where the aggregate expenditure line intersects the 45-degree line at point E0, which is a real GDP of Rs.6,000, and which is below the potential GDP of Rs.7,000. In this situation, the level of aggregate expenditure is too low for GDP to reach its full employment level, and unemployment will occur. The distance between an output level like E0 that is below potential GDP and the level of potential GDP is called a recessionary gap. Because the equilibrium level of real GDP is so low, firms will not wish to hire the full employment number of workers, and unemployment will be high.

Figure 3.18: Recessionary and Inflationary Gaps

Figure (a): If the equilibrium occurs at an output below potential GDP, then a recessionary gap exists. The policy solution to a recessionary gap is to shift the aggregate expenditure schedule up from AE0 to AE1, using policies like tax cuts or government spending increases. Then the new equilibrium E1 occurs at potential GDP.

Figure (b): If the equilibrium occurs at an output above potential GDP, then an inflationary gap exists. The policy solution to an inflationary gap is to shift the aggregate expenditure schedule down from AE0 to AE1, using policies like tax increases or spending cuts. Then, the new equilibrium E1 occurs at potential GDP.
Anything that shifts the aggregate expenditure line down is a potential cause of recession, including a decline in consumption, a rise in savings, a fall in investment, a drop in government spending or a rise in taxes, or a fall in exports or a rise in imports. Moreover, an economy that is at equilibrium with a recessionary gap may just stay there and suffer high unemployment for a long time; remember, the meaning of equilibrium is that there is no particular adjustment of prices or quantities in the economy to chase the recession away. The appropriate response to a recessionary gap is for the government to reduce taxes or increase spending so that the aggregate expenditure function shifts up from AE0 to AE1. When this shift occurs, the new equilibrium E1 now occurs at potential GDP as shown in Figure (a)(above diagram). Conversely, Figure (b) shows a situation where the aggregate expenditure schedule (AE0) intersects the 45-degree line above potential GDP. The gap between the level of real GDP at the equilibrium E0 and potential GDP is called an inflationary gap. The inflationary gap also requires a bit of interpreting. After all, a naïve reading of the Keynesian cross diagram might suggest that if the aggregate expenditure function is just pushed up high enough, real GDP can be as large as desired—even doubling or tripling the potential GDP level of the economy. This implication is clearly wrong. An economy faces some supply-side limits on how much it can produce at a given time with its existing quantities of workers, physical and human capital, technology, and market institutions.

The inflationary gap should be interpreted, not as a literal prediction of how large real GDP will be, but as a statement of how much extra aggregate expenditure is in the economy beyond what is needed to reach potential GDP. An inflationary gap suggests that because the economy cannot produce enough goods and services to absorb this level of aggregate expenditures, the spending will instead cause an inflationary increase in the price level. In this way, even though changes in the price level do not appear explicitly in the Keynesian cross equation, the notion of inflation is implicit in the concept of the inflationary gap. The appropriate Keynesian response to an inflationary gap is shown in Figure (b). The original intersection of aggregate expenditure line AE0 and the 45-degree line occurs at Rs.8,000, which is above the level of potential GDP at Rs.7,000. If AE0 shifts down to AE1, so that the new equilibrium is at E1, then the economy will be at potential GDP without pressures for inflationary price increases. The government can achieve a downward shift in aggregate
expenditure by increasing taxes on consumers or firms, or by reducing government expenditures.

The Multiplier Effect

The Keynesian policy prescription has one final twist. Assume that for a certain economy, the intersection of the aggregate expenditure function and the 45-degree line is at a GDP of 700, while the level of potential GDP for this economy is Rs.800. By how much does government spending need to be increased so that the economy reaches the full employment GDP? The obvious answer might seem to be Rs.800 – Rs.700 = Rs.100; so raise government spending by Rs.100. But that answer is incorrect. A change of, for example, Rs.100 in government expenditures will have an effect of more than Rs.100 on the equilibrium level of real GDP. The reason is that a change in aggregate expenditures circles through the economy: households buy from firms, firms pay workers and suppliers, workers and suppliers buy goods from other firms, those firms pay their workers and suppliers, and so on. In this way, the original change in aggregate expenditures is actually spent more than once. This is called the multiplier effect: An initial increase in spending, cycles repeatedly through the economy and has a larger impact than the initial dollar amount spent.

To understand how the multiplier effect works, return to the example in which the current equilibrium in the Keynesian cross diagram is a real GDP of Rs.700, or Rs.100 short of the Rs.800 needed to be at full employment, potential GDP. If the government spends Rs.100 to close this gap, someone in the economy receives that spending and can treat it as income. Assume that those who receive this income pay 30% in taxes, save 10% of after-tax income, spend 10% of total income on imports, and then spend the rest on domestically produced goods and services. Out of the original Rs.100 in government spending, Rs.53 is left to spend on domestically produced goods and services. That Rs. 53 which was spent, becomes income to someone, somewhere in the economy. Those who receive that income also pay 30% in taxes, save 10% of after-tax income, and spend 10% of total income on imports, as shown in Figure B10, so that an additional Rs.28.09 (that is, 0.53 × Rs.53) is spent in the third round. The people who receive that income then pay taxes, save, and buy imports, and the amount spent in the fourth round is Rs.14.89 (that is, 0.53 × Rs.28.09).

Thus, over the first four rounds of aggregate expenditures, the impact of the original increase in government spending of Rs.100 creates a rise in aggregate expenditures of Rs.100 + Rs.53
+ Rs.28.09 + Rs.14.89 = Rs.195.98. The additional boost to aggregate expenditures is shrinking in each round of consumption. After about 10 rounds, the additional increments are very small indeed—nearly invisible to the naked eye. After 30 rounds, the additional increments in each round are so small that they have no practical consequence. After 30 rounds, the cumulative value of the initial boost in aggregate expenditure is approximately Rs.213. Thus, the government spending increase of Rs.100 eventually, after many cycles, produced an increase of Rs.213 in aggregate expenditure and real GDP. In this example, the multiplier is Rs.213/Rs.100 = 2.13.

Calculating the Multiplier

Fortunately for everyone who is not carrying around a computer with a spreadsheet program to project the impact of an original increase in expenditures over 20, 50, or 100 rounds of spending, there is a formula for calculating the multiplier.

\[
\text{Spending Multiplier} = \frac{1}{(1 - \text{MPC} \times (1 - \text{tax rate}) + \text{MPI})}
\]

- Marginal Propensity to Save (MPS) = 30%
- Tax rate = 10%
- Marginal Propensity to Import (MPI) = 10%

The MPC is equal to 1 – MPS, or 0.7. Therefore, the spending multiplier is:

\[
\text{Spending Multiplier} = 1 ÷ 1 - (0.7 - (0.10)(0.7) - 0.10)
\]

\[
= 1 ÷ 0.47
\]

\[
= 2.13
\]

A change in spending of Rs.100 multiplied by the spending multiplier of 2.13 is equal to a change in GDP of Rs.213. The size of the multiplier is determined by what proportion of the marginal dollar of income goes into taxes, saving, and imports. These three factors are known as “leakages,” because they determine how much demand “leaks out” in each round of the multiplier effect. If the leakages are relatively small, then each successive round of the multiplier effect will have larger amounts of demand, and the multiplier will be high. Conversely, if the leakages are relatively large, then any initial change in demand will diminish more quickly in the second, third, and later rounds and the multiplier will be small.
Changes in the size of the leakages—a change in the marginal propensity to save, the tax rate, or the marginal propensity to import—will change the size of the multiplier.

**Understanding fiscal policy using Keynesian Cross model**

Keynesian macroeconomics argues that the solution to a recession is expansionary fiscal policy, such as tax cuts to stimulate consumption and investment, or direct increases in government spending that would shift the aggregate demand curve to the right. For example, if aggregate demand was originally at ADr in the following figure, so that the economy was in recession, the appropriate policy would be for government to shift aggregate demand to the right from ADr to ADf, where the economy would be at potential GDP and full employment.

![Figure 3.19: Keynesian Cross model](image)

Keynes noted that while it would be nice if the government could spend additional money on housing, roads, and other amenities, he also argued that if the government could not agree on how to spend money in practical ways, then it could spend in impractical ways. For example, Keynes suggested building monuments, like a modern equivalent of the Egyptian pyramids. He proposed that the government could bury money underground, and let mining companies start digging up the money again. These suggestions were slightly tongue-in-cheek, but their purpose was to emphasize that a Great Depression is no time to quibble over the specifics of
government spending programs and tax cuts when the goal should be to pump up aggregate demand by enough to lift the economy to potential GDP. The other side of Keynesian policy occurs when the economy is operating above potential GDP. In this situation, unemployment is low, but inflationary rises in the price level are a concern. The Keynesian response would be contractary fiscal policy, using tax increases or government spending cuts to shift AD to the left. The result would be downward pressure on the price level, but very little reduction in output or very little rise in unemployment. If aggregate demand was originally at ADi in so that the economy was experiencing inflationary rises in the price level, the appropriate policy would be for government to shift aggregate demand to the left, from ADi toward ADf, which reduces the pressure for a higher price level while the economy remains at full employment. In the Keynesian economic model, too little aggregate demand brings unemployment and too much brings inflation. Thus, you can think of Keynesian economics as pursuing a “Goldilocks” level of aggregate demand: not too much, not too little, but looking for what is just right.

The Keynesian Perspective on Market Forces

Ever since the birth of Keynesian economics in the 1930s, controversy has simmered over the extent to which government should play an active role in managing the economy. In the aftermath of the human devastation and misery of the Great Depression, many people—including many economists—became more aware of vulnerabilities within the market-oriented economic system. Some supporters of Keynesian economics advocated a high degree of government planning in all parts of the economy. However, Keynes himself was careful to separate the issue of aggregate demand from the issue of how well individual markets worked. He argued that individual markets for goods and services were appropriate and useful, but that sometimes that level of aggregate demand was just too low. When 10 million people are willing and able to work, but one million of them are unemployed, he argued, individual markets may be doing a perfectly good job of allocating the efforts of the nine million workers—the problem is that insufficient aggregate demand exists to support jobs for all 10 million. Thus, he believed that, while government should ensure that overall level of aggregate demand is sufficient for an economy to reach full employment, this task did not imply that the government should attempt to set prices and wages throughout the economy, nor to take over and manage large corporations or entire industries directly.
The Keynesian approach, with its focus on aggregate demand and sticky prices, has proved useful in understanding how the economy fluctuates in the short run and why recessions and cyclical unemployment occur. In The Neoclassical Perspective, we will consider some of the shortcomings of the Keynesian approach and why it is not especially well-suited for long-run macro economic analysis.

The Expenditure Multiplier

A key concept in Keynesian economics is the expenditure multiplier. The expenditure multiplier is the idea that not only does spending affect the equilibrium level of GDP, but that spending is powerful. More precisely, it means that a change in spending causes a more than proportionate change in GDP.

\[
\frac{\Delta Y}{\Delta \text{Spending}} > 1
\]

The reason for the expenditure multiplier is that one person’s spending becomes another person’s income, which leads to additional spending and additional income so that the cumulative impact on GDP is larger than the initial increase in spending. The appendix on The Expenditure-Output Model provides the details of the multiplier process, but the concept is important enough for us to summarize here. While the multiplier is important for understanding the effectiveness of fiscal policy, it occurs whenever any autonomous increase in spending occurs. Additionally, the multiplier operates in a negative as well as a positive direction. Thus, when investment spending collapsed during the Great Depression, it caused a much larger decrease in real GDP.

Tax Multiplier:

Is a measure of the change in aggregate production caused by changes in government taxes. The tax multiplier is the negative marginal propensity to consume times one minus the slope of the aggregate expenditures line. The simple tax multiplier includes only induced consumption. More complex tax multipliers include other induced components. Two related multipliers are the expenditures multiplier, which measures the change in aggregate production caused by changes in an autonomous aggregate expenditure, and the balanced-budget multiplier which measures the change in aggregate production from equal changes in both taxes and government purchases.
The tax multiplier measures the change in aggregate production triggered by an autonomous change in government taxes. This multiplier is useful in the analysis of fiscal policy changes in taxes. The tax multiplier differs from the expenditures multiplier based on how the autonomous change affects aggregate expenditures.

The tax multiplier reflects the fact that a given autonomous change in taxes does not result in an equal change in aggregate expenditures. Taxes change disposable income, which causes changes in both consumption expenditures and saving. And only consumption expenditures affect aggregate expenditures. The expenditures multiplier, however, reflects the fact that a given autonomous change in expenditure results in an equal change in aggregate expenditures.

The tax multiplier is actually a family of multipliers that differ based on which components of the Keynesian model are assumed to be induced by aggregate production and income. The simple tax multiplier is the simplest variation and includes only induced consumption. Every other component like investment expenditures, government purchases, taxes, exports, and imports are assumed to be autonomous.

More complex tax multipliers include different combinations of induced components, ranging all of the way up to the “complete” tax multiplier that realistically includes all induced components. Induced consumption, investment, and government purchases all increase the value of the expenditures multiplier. Induced taxes and imports both decrease the value of the expenditures multiplier.

**The Simple Tax Multiplier**

The simple tax multiplier is the ratio of the change in aggregate production to an autonomous change in government taxes when consumption is the only induced expenditure. Autonomous tax changes trigger the multiplier process and induced consumption provides the cumulatively reinforcing interaction between consumption, aggregate production, factor payments, and income.

The formula for this simple tax multiplier is:

\[
m[\text{tax}] = -MPC \times \frac{1}{MPS} = -\frac{MPC}{MPS}
\]
Where MPC is the marginal propensity to consume and MPS is the marginal propensity to save. This formula is almost identical to that for the simple expenditures multiplier. The only difference is the inclusion of the negative marginal propensity to consume (-MPC).

If, for example, the MPC is 0.75 (and the MPS is 0.25), then an autonomous Rs.1 trillion change in taxes results in an opposite change in aggregate production of Rs.3 trillion.

Two Differences
The key feature of the simple tax multiplier that differentiates it from the simple expenditures multiplier is how taxes affect aggregate expenditures. In particular, taxes do not affect aggregate expenditures directly (as do government purchases or investment expenditures). They affect aggregate expenditures indirectly through disposable income and consumption. This gives rise to two important differences compared to the simple expenditures multiplier:

- First, a change in taxes causes an opposite change in the disposable income of the household sector. An increase in taxes decreases disposable income and an decrease in taxes increases disposable income. This is why the simple tax multiplier has a negative value.
- Second, the household sector reacts to the change in disposable income caused by the change in taxes by changing both consumption and saving. How much a consumption change is based on the MPC. The MPC means that for each one dollar change in taxes, consumption and thus aggregate expenditures change by a only fraction. The fraction is equal to the MPC. The reason, of course, is that the taxes affect income and income is divided between saving and taxes.

Suppose, for example, that the government sector reduces taxes by Rs.1 trillion with the goal of stimulating aggregate production and warding off a business-cycle contraction. This tax reduction increases disposable income by Rs.1 trillion. The household sector spends part and saves part of this income. The division between consumption and saving is based on the marginal propensities to consume and save.

If the marginal propensity to consume is 0.75, then consumption increases by Rs.750 billion. This Rs.750 billion change in consumption then triggers the multiplier process much like that for an autonomous change in investment expenditures. The difference, however, is the full Rs.1 trillion changes in investment triggers the multiplier process, but only 75 percent of the change in taxes works its way into the multiplier.
More Complex Tax Multipliers

The simple tax multiplier assumes that consumption is the only induced component. In the real world, however, consumption is not the only induced expenditure. Investment, government purchases, taxes, and net exports (through imports) are also induced. A more complete, more realistic, and more complex multiplier includes induced components.

Here is the formula for just such a multiplier, which can be labeled $m_{\text{tax-all}}$.

$$ m_{\text{tax-all}} = \frac{-MPC}{1 - [MPC + MPI + MPG - (MPC \times MP) - MPM]} $$

This particular multiplier has a number of abbreviations containing the letters "MP." These are the assorted induced components, with "MP" standing for marginal propensity. In fact, the batch of abbreviations within the brackets "[]" is actually the slope of the aggregate expenditures line.

Let’s run through the cast of characters in this formula.

- MPC is the marginal propensity to consume.
- MPI is the marginal propensity to invest.
- MPG is the marginal propensity for government purchases.
- MPT is the marginal propensity to tax.
- MPM is the marginal propensity to import.

This complex tax multiplier can be used to determine the change in aggregate production resulting from a change in taxes. This particular tax multiplier formulation includes all induced components. However, several other tax multipliers that include different combinations of these induced components can be identified. One multiplier can include only induced consumption and induced investment. Another can include induced consumption, induced government purchases, and induced taxes. The possibilities are almost endless.

Balanced-budget Multiplier:

Is a measure of the change in aggregate production caused by equal changes in government purchases and taxes. The balanced-budget multiplier is equal to one, meaning that the multiplier effect of a change in taxes offsets all but the initial production triggered by the change in government purchases. This multiplier is the combination of the expenditures multiplier, which measures the change in aggregate production caused by changes in an autonomous aggregate expenditure, and the tax multiplier which measures the change in
aggregate production caused by changes in taxes. The balanced-budget multiplier measures the change in aggregate production triggered by an autonomous change in government taxes. This multiplier is useful in the analysis of fiscal policy changes that involves both government purchases and taxes.

The logic behind this multiplier comes from the government's budget, which includes both spending and taxes. In general, a balanced budget has equality between spending and taxes. As such, the balanced-budget multiplier analyzes what happens when there is equality between changes in government purchases and taxes, that is, actions that keep the budget “balanced.”

In other words, the balanced-budget multiplier indicates the overall impact on aggregate production of a change in government purchases that is matched (that is, paid for) by an equivalent change in taxes. The balanced-budget multiplier, as such, is actually the sum of the expenditures multiplier (for government purchases) and the tax multiplier. The balanced-budget multiplier is equal to one. The “positive” impact on aggregate production caused by a change in government purchases is largely, but not completely, offset by the "negative" impact of the change in taxes. The only part of the impact of the change in government purchases not offset by the change in taxes is the purchase of aggregate production made by the initial injection. Hence, the change in aggregate production is equal to the initial change in government purchases.

A Simple Formulation

The balanced-budget multiplier, like the expenditures multiplier and tax multiplier can come in several different varieties based on assumptions concerning the structure of the economy and what components are induced by aggregate production. However, the value of the balanced-budget multiplier is the same whether consumption is the only induced expenditure or all components are assumed to be induced. The reason is that all of the "induced" changes in aggregate production caused by changes in government purchases are cancelled out by opposite changes in taxes. So it matters not what components are induced.

As such, here is the balanced-budget multiplier \((m_{bb})\) based on the combination of the simple expenditures multiplier and the simple tax multiplier.

\[
m_{bb} = \frac{1}{MPS} + \frac{-MPC}{MPS} = \frac{1 - MPC}{MPS} \approx \frac{MPS}{MPS} = 1
\]
Where MPC is the marginal propensity to consume and MPS is the marginal propensity to save. The most obvious and most important point is that the balanced-budget multiplier has a value of 1. This value indicates that the change in aggregate production is caused by the initial injection of government purchases. The subsequent changes in aggregate production that might be result as government purchases trigger cumulatively reinforcing induced changes in factor payments, income, and consumption are cancelled out by an opposite impact from the change in taxes.

Suppose, for example, that government purchases are increased by Rs.1 trillion using fiscal policy designed to correct a business-cycle contraction. By itself, this Rs.1 trillion government purchases increase would be expected to trigger a Rs.4 trillion increase in aggregate production.

However, further suppose that this Rs.1 trillion increase in government purchases is matched by, and paid for with, an equal Rs.1 trillion increase in taxes. By itself, this Rs.1 trillion increase in taxes is expected to trigger a Rs.3 trillion decrease in aggregate production. The net impact on aggregate production of both changes is only Rs.1 trillion, not Rs.4 trillion. If a Rs.4 trillion increase in aggregate production is needed to achieve full employment, then this strategy falls Rs.3 trillion short.

- First, the increase in aggregate production triggered by the increase in government purchases is offset by a decrease in aggregate production triggered by the increase in taxes.
- Second, the increase in aggregate production stimulated by government purchases is only partially offset by the decrease aggregate production stimulated by taxes.

The offset is only partial and there is a net impact on production due to the way taxes and government purchases affect aggregate expenditures. All Rs.1 trillion of the government purchases act to increase aggregate expenditures. However, only Rs.750 billion of the taxes (due to a marginal propensity to consume of 0.75) work their way through consumption to decrease aggregate expenditures.

As such, there remains a net increase in aggregate expenditures of Rs.250 billion. Evaluating this net increase of Rs.250 billion using the simple expenditures multiplier of 4 identifies an increase in aggregate production of Rs. 1 trillion. Is it just a coincidence that this net increase in aggregate production is exactly equal to the original change in government purchases. Only the initial Rs.1 trillion government purchase triggers an increase in aggregate
production. Each subsequent round of increased consumption that would be otherwise induced by the multiplier process is offset by decreased consumption resulting by higher taxes. The only expenditure that does not go through the household sector and is not cancelled by taxes is the original government purchase.
MODULE IV

MONEY

The word ‘money’ is derived from the Latin word ‘Moneta’ which was the surname of the Roman Goddess of Juno in whose temple at Rome, money was coined. The origin of money is lost in antiquity. Even the primitive man had some sort of money. The type of money in every age depended on the nature of its livelihood. In a hunting society, the skins of wild animals were used as money. The pastoral society used livestock, whereas the agricultural society used grains and foodstuffs as money. The Greeks used coins as money.

Stages in the evolution of money

The evolution of money has passed through the following five stages depending upon the progress of human civilization at different times and places.

Commodity money

Various types of commodities have been used as money from the beginning of human civilization. Stones, spears, skins, bows and arrows, and axes were used as money in the hunting society. The pastoral society used cattle as money. The agricultural society used grains as money. The Romans used cattle and salt as money at different times. The Mongolians used squirrel skins as money. Precious stones, tobacco, tea shells, fishhooks and many other commodities served as money depending upon time, place and economic standard of the society.

The use of commodities as money had the following defects.

- All the commodities were not uniform in quality, such as cattle, grains, etc. Thus lack of standardization made pricing difficult.
- It is difficult to store and prevent loss of value in the case of perishable commodities.
- Supplies of such commodities were uncertain.
- They lacked in portability and hence were difficult to transfer from one place to another.
- There was the problem of indivisibility in the case of such commodities as cattle.
Metallic Money

With the spread of civilization and trade relations by land and sea, metallic money took the place of commodity money. Many nations started using silver, gold, copper, tin, etc. as money.

But metal was an inconvenient thing to accept, weigh, divide and assess in quality. Accordingly, metal was made into coins of predetermined weight. This innovation is attributed to King Midas of Lydia in the eighth century B.C. But gold coins were used in India many centuries earlier than in Lydia. Thus coins came to be accepted as convenient method of exchange.

As the price of gold began to rise, gold coins were melted in order to earn more by selling them as metal. This led governments to mix copper or silver in gold coins since their intrinsic value might be more than their face value. As gold became dearer and scarce, silver coins were used, first in their pure form and later on mixed with alloy or some other metal.

But metallic money had the following limitations.

- It was not possible to change its supply according to the requirements of the nation both for internal and external use.
- Being heavy, it was not possible to carry large sums of money in the form of coins from one place to another by merchants.
- It was unsafe and inconvenient to carry precious metals for trade purposes over long distances.
- Metallic money was very expensive because the use of coins led to their debasement and their minting and exchange at the mint cost a lot to the government.

Paper Money

The development of paper money started with goldsmiths who kept strong safes to store their gold. As goldsmiths were thought to be honest merchants, people started keeping their gold with them for safe custody. In return, the goldsmiths gave the depositors a receipt promising to return the gold on demand. These receipts of the goldsmiths were given to the sellers of commodities by the buyers. Thus receipts of the goldsmith were a substitute for money. Such paper money was backed by gold and was convertible on demand into gold. This ultimately led to the development of bank notes.
The bank notes are issued by the central bank of the country. As the demand for gold and silver increased with the rise in their prices, the convertibility of bank notes into gold and silver was gradually given up during the beginning and after the First World War in all the countries of the world. Since then the bank money has ceased to be representative money and is simply ‘fiat money’ which is inconvertible and is accepted as money because it is backed by law.

Credit Money

Another stage in the evolution of money in the modern world is the use of the cheque as money. The cheque is like a bank note in that it performs the same function. It is a means of transferring money or obligations from one person to another. But a cheque is different from a bank note. A cheque is made for a specific sum, and it expires with a single transaction. A cheque is not money. It is simply a written order to transfer money. However, large transactions are made through cheques these days and bank notes are used only for small transactions.

Near Money

The final stage in the evolution of money has been the use of bills of exchange, treasury bills, bonds, debentures, savings certificates, etc. They are known as ‘near money’. They are close substitutes for money and are liquid assets. Thus, in the final stage of its evolution money became intangible. It’s ownership in now transferable simply by book entry.

Definition of Money

To give a precise definition of money is a difficult task. Various authors have given different definition of money. According to Crowther, “Money can be defined as anything that is generally acceptable as a means of exchange and that at the same time acts as a measure and a store of value”. Professor D H Robertson defines money as “anything which is widely accepted in payment for goods or in discharge of other kinds of business obligations.

From the above two definitions of money two important things about money can be noted.

Firstly, money has been defined in terms of the functions it performs. That is why some economists defined money as “money is what money does’. It implies that money is anything which performs the functions of money.
Secondly, an essential requirement of any kind of money is that it must be generally acceptable to every member of the society. Money has a value for ‘A’ only when he thinks that ‘B’ will accept it in exchange for the goods. And money is useful for ‘B’ only when he is confident that ‘C’ will accept it in settlement of debts. But the general acceptability is not the physical quality possessed by the good. General acceptability is a social phenomenon and is conferred upon a good when the society by law or convention adopts it as a medium of exchange.

**Functions of Money**

The major functions of money can be classified into three. They are: The primary functions, secondary functions and contingent functions.

**Primary functions of Money**

The primary functions of money are;

- Medium of exchange
- Measure of value

**Medium of Exchange**

The most important function of money is that it serves as a medium of exchange. In the barter economy commodities were exchanged for commodities. But it had experienced many difficulties with regard to the exchange of goods and services. To undertake exchange, barter economy required ‘double coincidence of wants’. Money has removed this problem. Now a person A can sell his goods to B for money and then he can use that money to buy the goods he wants from others who have these goods. As long as money is generally acceptable, there will be no difficulty in the process of exchange. By serving a very convenient medium of exchange money has made possible the complex division of labour or specialization in the modern economic organization.

**Measure of value**

Another important function of money is that the money serves as a common measure of value or a unit of account. Under barter system there was no common measure of value and the value of different goods were measured and compared with each other. Money has solved this difficulty and serves as a yardstick for measuring the value of goods and services. As the value of all goods and services are measured in terms of money, their relative values can be
easily compared.

Secondary functions

The secondary functions of money are;

Standard of deferred payments

Another important function of money is that it serves as a standard for deferred payments. Deferred payments are those payments which are to be made in future. If a loan is taken today, it would be paid back after a period of time. The amount of loan is measured in terms of money and it is paid back in money. A large amount of credit transactions involving huge future payments are made daily. Money performs this function of standard of deferred payments because its value remains more or less stable.

When the price changes the value of money also changes. For instance, when the prices are falling, value of money will rise. As a result, the creditors will gain in real terms and the debtors will lose. Conversely, when the prices are rising (or, value of money is falling) creditors will be the losers. Thus if the money is to serve as a fair and correct standard of deferred payments, its value must remain stable. Thus when there is severe inflation or deflation, money ceases to serve as a standard of deferred payments.

Store of value

Money acts as a store of value. Money being the most liquid of all assets is a convenient form in which to store wealth. Thus money is used to store wealth without causing deterioration or wastage. In the past gold was popular as a money material. Gold could be kept safely without deterioration.

Of course, there are other assets like houses, factories, bonds, shares, etc., in which wealth can be stored. But money performs as a different thing to store the value. Money being the most liquid of all assets has the advantage that an individual or a firm can buy with it anything at any time. But this is not the case with other assets. Other assets like buildings, shares, etc., have to be sold first and converted into money and only then they can be used to buy other things. Money would perform the store of value function properly if it remains stable in value.
In short, money has removed the difficulties of barter system, namely, lack of double coincidence of wants, lack of division and lack of measure and store of value and lack of a standard of deferred payment. It has facilitated trade and has made possible the complex division of labour and specialization of the modern economic system.

**Contingent functions**

The important contingent functions of money are:

1. Basis of credit
   
   It is with the development of money market the credit market began to flourish.

2. Distribution of national income
   
   Being a common measure of value, money serves as the best medium to distribute the national income among the four factors of production.

3. Transfer of value
   
   Money helps to transfer value from one place to another.

4. Medium of compensations
   
   Accidents and carelessness cause damage to the property and life. Compensation can be paid to such damages in terms of money.

5. Liquidity
   
   Liquidity means the ready purchasing power or convertibility of money in to any commodity. Money is the most liquid form of all assets.

   
   Utility of goods and services can be expressed in terms of money. Similarly, marginal productivity is measured in terms of prices of goods and factors. Thus money become the base of measurement and which directs the production and consumption.

7. Guarantor of solvency
   
   Solvency refers to the ability to pay off debt. Persons and firms have to be solvent while doing the business. The deposits of money serves as the best guarantor of solvency.

**Forms of Money**
Money of Account

Money of account is the monetary unit in terms of which the accounts of a country are kept and transactions settled, i.e., in which general purchasing power, debts and prices are expressed. The rupee is, for instance, our money of account. Sterling is the money of account if Great Britain and Mark that of Germany. Money of account need not, however, be actually circulating in the country. During 1922-24 the mark in Germany depreciated in such an extent that it ceased to be the money of account.

Limited and unlimited legal tender

Money which has legal sanction is called legal tender money. So its acceptance is compulsory. It is an offence to refuse to accept payment in legal tender money. Thus a legal tender currency is one in terms of which debts can be legally paid. A currency is unlimited legal tender when debts upon any amount can be paid through it. It is limited legal tender when payments only up to a given limit can be made by means of it. For example, rupee coins and rupee notes are unlimited legal tender in India. Any amount of transaction can be made by using them. But coins of lower amounts like 25 or 50 paisa are only limited legal tender (up to Rs.25/-). One can refuse to receive beyond this amount. When a coin is worn out and become light beyond a certain limit, then it ceases to be a legal tender. When one rupee and half-rupee coins are more than 20% below the standard weight they are no longer legal tender.

Standard money

Standard money is one in which the value of goods as well as all other forms of money are measured. In India prices of all goods are measured in terms of rupees. Moreover, the other forms of money such as half-rupee notes, one rupee notes, two rupee notes, five rupee notes etc. are expressed in terms of rupees. Thus rupee is the standard money of India. Standard money is always made the unlimited legal tender money. In old days the standard money was a full-bodied money. That is its face value is equal to its intrinsic value (metal value). But now-a-days in almost all countries of the world, even the standard money is only a token money. That is, the real worth of the material contained in it is very much less than the face value written in it.

Token money
Token money is a form of money in which the metallic value of which is much less than its real value (or face value). Rupees and all other coins in India are all token money.

**Bank money**

Demand deposits of banks are usually called bank money. Bank deposits are created when somebody deposits money with them. Banks also creates deposits when they advance loans to the businessmen and traders. These demand deposits are the important constituent of the money supply in the country.

It is important to note that bank deposits are generally divided into two categories: demand deposits and time deposits. Demand deposits are those deposits which are payable on demand through cheques and without any serving prior notice to the banks. On the other hand, time deposits are those deposits which have a fixed term of maturity and are not withdrawable on demand and also cheques cannot be drawn on them. Clearly, it is only demand deposits which serve as a medium of exchange, for they can be transferred from one person to another through drawing a cheque on them as and when desired by them. However, since time or fixed deposits can be withdrawn by forgoing some interest and can be used for making payments, they are included in the concept of broad money, generally called M3.

**Inside money** is a term that refers to any debt that is used as money. It is a liability to the issuer. The net amount of inside money in an economy is zero. At the same time, most money circulating in a modern economy is inside money.

**Outside money** is a term that refers to money that is not a liability for anyone "inside" the economy. It is held in an economy in net positive amounts. Examples are gold or assets denominated in foreign currency or otherwise backed up by foreign debt, like foreign cash, stocks or bonds. Typically, the private economy is considered as the "inside", so government-issued money is also "outside money."

**Bond**

A bond is a fixed income instrument that represents a loan made by an investor to a borrower (typically corporate or governmental). A bond could be thought of as an I.O.U. between the lender and borrower that includes the details of the loan and its payments. Bonds are used by companies, municipalities, states, and sovereign governments to finance projects and operations. Owners of bonds are debt holders, or creditors, of the issuer. Bond details include
the end date when the principal of the loan is due to be paid to the bond owner and usually includes the terms for variable or fixed interest payments made by the borrower.

**Characteristics of Bonds**

Most bonds share some common basic characteristics including:

- **Face value** is the money amount the bond will be worth at maturity; it is also the reference amount the bond issuer uses when calculating interest payments. For example, say an investor purchases a bond at a premium $1,090 and another investor buys the same bond later when it is trading at a discount for $980. When the bond matures, both investors will receive the $1,000 face value of the bond.

- **The coupon rate** is the rate of interest the bond issuer will pay on the face value of the bond, expressed as a percentage. For example, a 5% coupon rate means that bondholders will receive 5% x $1000 face value = $50 every year.

- **Coupon dates** are the dates on which the bond issuer will make interest payments. Payments can be made in any interval, but the standard is semiannual payments.

- **The maturity date** is the date on which the bond will mature and the bond issuer will pay the bondholder the face value of the bond.

- **The issue price** is the price at which the bond issuer originally sells the bonds.

**Varieties of Bonds**

The bonds available for investors come in many different varieties. They can be separated by the rate or type of interest or coupon payment, being recalled by the issuer, or have other attributes.

**Zero-coupon bonds** do not pay coupon payments and instead are issued at a discount to their par value that will generate a return once the bondholder is paid the full face value when the bond matures. U.S. Treasury bills are a zero-coupon bond.

**Convertible bonds** are debt instruments with an embedded option that allows bondholders to convert their debt into stock (equity) at some point, depending on certain conditions like the share price. For example, imagine a company that needs to borrow $1 million to fund a new project. They could borrow by issuing bonds with a 12% coupon that matures in 10 years. However, if they knew that there were some investors willing to buy bonds with an 8%
coupon that allowed them to convert the bond into stock if the stock’s price rose above a certain value, they might prefer to issue those.

The convertible bond may the best solution for the company because they would have lower interest payments while the project was in its early stages. If the investors converted their bonds, the other shareholders would be diluted, but the company would not have to pay any more interest or the principal of the bond.

The investors who purchased a convertible bond may think this is a great solution because they can profit from the upside in the stock if the project is successful. They are taking more risk by accepting a lower coupon payment, but the potential reward if the bonds are converted could make that trade-off acceptable.

Callable bonds also have an embedded option but it is different than what is found in a convertible bond. A callable bond is one that can be “called” back by the company before it matures. Assume that a company has borrowed $1 million by issuing bonds with a 10% coupon that mature in 10 years. If interest rates decline (or the company’s credit rating improves) in year 5 when the company could borrow for 8%, they will call or buy the bonds back from the bondholders for the principal amount and reissue new bonds at a lower coupon rate.

A callable bond is riskier for the bond buyer because the bond is more likely to be called when it is rising in value. Remember, when interest rates are falling, bond prices rise. Because of this, callable bonds are not as valuable as bonds that aren’t callable with the same maturity, credit rating, and coupon rate.

A Puttable bond allows the bondholders to put or sell the bond back to the company before it has matured. This is valuable for investors who are worried that a bond may fall in value, or if they think interest rates will rise and they want to get their principal back before the bond falls in value.

The bond issuer may include a put option in the bond that benefits the bondholders in return for a lower coupon rate or just to induce the bond sellers to make the initial loan. A puttable bond usually trades at a higher value than a bond without a put option but with the same credit rating, maturity, and coupon rate because it is more valuable to the bondholders.
The possible combinations of embedded puts, calls, and convertibility rights in a bond are endless and each one is unique. There isn’t a strict standard for each of these rights and some bonds will contain more than one kind of “option” which can make comparisons difficult. Generally, individual investors rely on bond professionals to select individual bonds or bond funds that meet their investing goals.

**Relationship between Bond and Interest Rate**

This is why the famous statement that a bond’s price varies inversely with interest rates works. When interest rates go up, bond prices fall in order to have the effect of equalizing the interest rate on the bond with prevailing rates, and vice versa.

Another way of illustrating this concept is to consider what the yield on our bond would be given a price change, instead of given an interest rate change. For example, if the price were to go down from $1,000 to $800, then the yield goes up to 12.5%. This happens because you are getting the same guaranteed $100 on an asset that is worth $800 ($100/$800). Conversely, if the bond goes up in price to $1,200, the yield shrinks to 8.33% ($100/$1,200).

**Theories of Demand for Money**

Why people have demand for money to hold is an important issue in macroeconomics. The level of demand for money not only determines the rate of interest but also the level of prices and national income of the economy. The demand for money arises from two important functions of money. The first is that money acts as a medium of exchange and the second is that it is a store of value. Thus individuals and businesses wish to hold money partly in cash and partly in the form of assets.

What determines the changes in demand for money is a major issue. There are two views. The first is the ‘scale’ view which is related to the impact of the income or wealth levels upon the demand for money. The demand for money is directly related to the income level. The higher the income level, the greater will be the demand for money.

The second is the ‘substitution’ view which is related to relative attractiveness of assets that can be substituted for money. According to this view, when alternative assets like bonds become unattractive due to fall in interest rates, people prefer to keep their assets in cash, and the demand for money increases, and vice versa. The scale and substitution view combined together have been used to explain the nature of the demand for money which has
been split into the transactions demand, the precautionary demand and the speculative demand.

Classical economists considered money as simply a means of payment or medium of exchange. In the classical model, people, therefore, demand money in order to make payments for their purchases of goods and services. In other words, they want to keep money for transaction purposes. On the other hand J M Keynes also laid stress on the store of value function of money. According to him, money is an asset and people want to hold it so as to take advantage of changes in the price of this asset, that is, the rate of interest. Therefore Keynes emphasized another motive for holding money which he called speculative motive. Under speculative motive, people demand to hold money balances to take advantage from the future changes in the rate of interest or what means the same thing from the future changes in bond prices.

An essential point to be noted about people’s demand for money is that what people want is not ‘nominal money’ holdings, but ‘real money balances’. This means that people are interested in the purchasing power of their money balances, that is, the value of money balances in terms of goods and services which they could buy. Thus people would not be interested in merely nominal money holdings irrespective of the price level, that is, the number of rupee notes and the bank deposits. If with the doubling of price level, nominal money holdings are also doubled, their real money balances would remain the same. If people are merely concerned with nominal money holdings irrespective of price level, they are said to suffer from ‘money illusion’.

The demand for money has been a subject of lively debate in economics because of the fact that monetary demand plays an important role in the determination of the price level, interest and income. Till recently, there were three approaches to demand for money, namely, transaction approach of Fisher, cash balance approach of Cambridge economics, Marshall and Pigou and Keynes theory of demand for money. However, in recent years, Baumol, Tobin and Friedman have put forward new theories of demand for money.

**Friedman’s Restatement of the Quantity Theory of Money**

Following the publication of Keynes’s General Theory of Employment Interest and Money in 1936, economists discarded the traditional quantity theory of money. But at the University of Chicago the quantity theory continued to be a central and vigorous part of discussion throughout 1930’s and 1940’s. At Chicago, Milton Friedman, Henry Simons, Lloyd Mints
Frank Knight and Jacob Viner taught and developed ‘a more subtle and relevant version’ of the quantity theory of money in which the quantity theory was connected and integrated with general price theory. The foremost exponent of the Chicago version of the quantity theory of money who led to the so-called “Monetarist Revolution” is Professor Friedman. In his essay “The Quantity Theory of Money – A Restatement” published in 1956, he set down a particular model of quantity theory of money.

### Friedman’s Theory

In his reformulation of the quantity theory, Friedman asserts that “the quantity theory is in the first instance a theory of demand for money. It is not a theory of output, or of money income, or of the price level”. The demand for money on the part of ultimate wealth holders is formally identical with that of the demand for consumption service. He regards the amount of real cash balances (M/P) as a commodity which is demanded because it yields services to the person who hold it. Thus money is an asset or capital good. Hence the demand for money forms part of capital of wealth theory.

For ultimate wealth holders, the demand for money, in real terms, is a function primarily of the following variables:

1. **Total wealth.** 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. According to Friedman income is a surrogate or wealth. 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 transactions 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 the liquidity of human wealth.

2. **The division of wealth between human and non-human forms.** The major source of wealth is the productive capacity of human beings which is human wealth. But the conversion of human wealth into non-human wealth or the reverse is subject to institutional constraints. This can be done by using current earnings to purchase non-human wealth or by using non-human wealth to finance the acquisition of skills. Thus the fraction of total wealth in the form...
of non-human wealth is an additional important variable. Friedman calls this ratio of wealth to income as ‘w’.

3. The expected rates of return on money and other assets. These rates of return are the counter parts of the prices of a commodity and its substitutes and complements in the theory of consumer demand. The nominal rate of return may be zero as it generally is on currency, or negative as it sometimes is on demand deposits, subject to net service charges, or positive as it is on demand deposits on which interest is paid, and generally on time deposits. The nominal rate of return on other assets consists of two parts: first any currently paid yield or cost, such as interest on bonds, dividends on equities and costs of storage on physical assets, and second, changes in the price of these assets which become especially important under conditions of inflation or deflation.

4. Other variables. Variables other than income may affect the utility attached to the services of money which determine liquidity proper. Tastes and preferences of wealth holders, trading in existing capital goods by ultimate wealth holders are other variables determine the demand for money along with other forms of wealth. Such variables are noted as ‘u’ by Friedman.

Broadly speaking, total wealth includes all sources of income or consumable services. It average expected yield on wealth during its life time.

Wealth can be held in five different forms: money, bonds, equities, physical goods, and human capital. Each form of wealth has a unique characteristic of its own and a different yield.

- Money is taken in the broadest sense to include currency, demand deposits and time deposits which yield interest on deposits. Thus money is a luxury good. It also yields real return in the form of convenience, security, etc. to the holder which is measured in terms of the general price level (P).
- Bonds are defined as claim to a time stream of payments that are fixed in nominal units.
- Equities are defined as a claim to a time stream of payments that are fixed in real units.
- Physical goods or non-human goods are inventories of producer and consumer durable.
- Human capital is the productive capacity of human beings.
Thus each form of wealth has a unique characteristic of its own and a different yield either explicitly in the form of interest, dividends, wages and salaries, etc. or implicitly in the form of services of money measured in terms of \( P \), and inventories. The present discounted value of these expected income flows from these five forms of wealth constitutes the current value of wealth which can be expressed as:

\[
W = \frac{Y}{r}
\]

Where \( W \) is the current value of total wealth, \( Y \) is the total flow of expected income from the five forms of wealth, and \( r \) is the interest rate. Friedman in his latest empirical study Monetary Trends in the United States and the United Kingdom (1982) gives the following demand function for money for an individual wealth holder with slightly different notations from his original study of 1956 as:

\[
\frac{M}{P} = f(Y, w, R_m, R_b, R_e, g_{P}, u)
\]

Where,
- \( M \) is the total stock of money demanded
- \( P \) is the price level
- \( Y \) is the real income
- \( w \) is the fraction of wealth in non-human form
- \( R_m \) is the expected nominal rate of return on money
- \( R_b \) is the expected rate of return on bonds including expected changes in their prices
- \( R_e \) is the expected nominal rate of return on equities, including in expected changes in their prices.
- \( g_{P} = \frac{1}{P} \frac{dP}{dt} \) is the expected rate of change of prices of goods and hence the expected nominal rate of return on physical assets and
- \( u \) stands for variables other than income that may affect the utility attached to the services of money.

The aggregate demand function for money is the summation of individual demand functions with \( M \) and \( y \) referring to per capita money holdings and per capita real income respectively, and \( w \) to the fraction of aggregate wealth in non-human form.

The demand function for money leads to the conclusion that a rise in the expected yields on different assets reduces the amount of money demanded by a wealth holder, and that an increase in wealth rises the demand for money. The income to which cash balances \( (M/P) \) are adjusted is the expected long term level of income rather than the current income being received. Empirical evidence suggests that the income elasticity of demand for money is greater than unity which means that income velocity is falling over the long run. This means
that the long run demand for money function is stable. In other words, the interest elasticity of the long run demand function for money is negligible.

In Friedman’s restatement of the quantity theory of money, the supply of money is independent of the demand for money. The supply of money is unstable due to the actions of the monetary authorities. On the other hand, demand for money is stable. It means that money which people want to hold in cash or bank deposits is related in a fixed way to their permanent income. If the central bank increases the supply of money by purchasing securities, people who sell securities will find that their holdings of money have increased in relation to their permanent income. They will therefore, spend their excess holdings of money partly on assets and partly on consumer goods and services. This spending will reduce their money balances and at the same time raise the national income. On the contrary, a reduction in the money supply by selling securities by the central bank will reduce the holdings of money of the buyers of the securities in relation to their permanent income. They will, therefore, raise their money holdings partly by selling their assets and partly by reducing their consumption expenditure on goods and services. This will tend to reduce the national income. Thus in both cases, the demand for money remains stable.

According to Friedman, a change in the supply of money causes a proportionate change in the price level or income or in both. Given the demand for money, it is possible to predict the effect of changes in the supply of money on total expenditure and income. If the economy is operating at less than full employment level, an increase in the supply of money will raise output and employment with a rise in total expenditure. This is possible only in the short run. Friedman’s quantity theory of money is explained in terms of the following figure.
In the figure income (Y) is measured on the vertical axis and the demand and supply of money are measured on the horizontal axis. MD is the demand for money curve which varies with income. MS is the money supply curve which is perfectly inelastic to changes in income. The two curves intersect at E and determine the equilibrium OY. If the money supply rises, the MS curve shifts to the right to M1S1. As a result, the money supply is greater than the demand for money which raises which raises the total expenditure until new equilibrium is established at E1. And the income rises to OY1.
Thus Friedman presents the quantity theory as the theory of the demand for money and the demand for money is assumed to depend on asset prices or relative returns and wealth or income. He shows how a stable demand for money becomes a theory of prices and output.

**KEYNES’ THEORY OF MONEY AND PRICES**
The classical quantity theory of money maintains that there is a direct and proportionate relationship between the quantity of money and prices. In other words, if money supply is doubled, the price level will be doubled and the value of money will be halved and vice versa. Keynes in his General Theory (1936) criticized the classical theory and advocates the view that there is no direct, simple and predictable relationship between the quantity of money and its value or prices. Keynes provided the causal process by which changes in the quantity of money brings changes in the price level.
Keynes used the term ‘Liquidity Preference’ for demand for money. How much of his income or resources will a person hold in the form of ready money (cash or non-interest paying bank deposits) and how much will he part with or lend depends upon what Keynes calls his liquidity preference. Liquidity preference means the demand for money to hold or the desire of the public to hold cash.

**Motives for Liquidity preference**
Liquidity preference of a particular individual depends upon several considerations. The question is why should the people hold their resources liquid or in the form of ready cash when they can get interest by lending money or buying bonds. The desire for liquidity arises because of three motives.

- The transactions motive
- The precautionary motive and;
- The speculative motive.

**The Transactions motive for money**
The transactions motive relates to the demand for money balances for the current transactions of individuals and business firms. Individuals hold cash in order to bridge the interval between the receipt of income and its expenditure. In other words, people hold money for transactions purposes because receipts of money and payments do not coincide. Most of the people receive their incomes weekly or monthly while the expenditure goes on day by day. A certain amount of ready money, therefore is kept in hand to make current payments. This amount will depend upon the size of individual’s income, the interval at which the income is received and the methods of payments prevailing in the society.

The businessmen and the entrepreneurs also have to keep a proportion of their resources in money form in order to meet daily needs of various kinds. They need money all the time in order to pay raw materials and transport, to pay wages and salaries and to meet all other current expenses incurred by any business firm. It is clear that the amount of money held under this business motive will depend to a very large extent on the turnover. The larger the turnover, the larger in general, will be the amount of money needed to cover current expenses. It is worth noting that money demand for transactions motive arises primarily because of the use of money as a medium of exchange.

The demand for money is a demand for real cash balances because people hold money for the purpose of buying goods and services. The higher the price level, the more the money balances a person has to hold in order to purchase a given quantity of goods.

According to Keynes, the transactions demand for money depends only on the real income and is not influenced by the rate of interest. However, in recent years, it has been observed empirically and also according to the theories of Tobin and Baumol transactions demand for money also depends on the rate of interest.

**Precautionary motive for money**

Precautionary motive for holding money refers to the desire of the people to hold cash balances for unemployment, sickness, accidents, and the other uncertain perils. The amount of money demanded for this motive will depend on the psychology of the individual and the conditions in which he lives.

**Speculative demand for money**

The speculative motive of the people relates to the desire to hold one’s resources in liquid form in order to take advantage of market movements regarding the future changes in the rate of interest (or bond prices). The notion of holding money for speculative motive was a new and revolutionary Keynesian idea. Money held under speculative motive serves as a store of
value as money held under the precautionary motive does. The cash held under this motive is used to make speculative gains by dealing in bonds whose prices fluctuate. If bonds prices are expected to rise which, in other words, means that the rate of interest is expected to fall, businessmen will buy bonds to sell when their prices actually rise. If, however, the bond prices are expected to fall, i.e., the rate of interest is expected to rise, businessmen will sell bonds to avoid capital losses.

Given the expectations about the changes in the rate of interest in future, less money will be held under speculative motive at a current rate of interest and more money will be held under this motive at a lower current rate of interest. Thus demand for money under speculative motive is a decreasing function of the current rate of interest, increasing as the rate of interest falls and decreasing as the rate of interest rises. This is shown in the following figure.

Figure 4.2

In the figure, X-axis represents speculative demand for money and Y-axis represents the rate of interest. The liquidity preference curve LP is a downward sloping towards the right signifying that the higher the rate of interest, the lower the demand for money for speculative motive, and vice versa. Thus at a high rate of interest 0r a very small amount 0M is held for speculative motive. This is because at a high current rate of interest much money would have been lend out or used for buying bonds and therefore less money would be kept as inactive balances. If the rate of interest falls to 0r1 then a greater amount 0M1 is held under speculative motive. With the further fall in the rate of interest to 0r2 money held under speculative motive increases to 0M2.

**Liquidity Trap**
It can be seen from the above figure that the liquidity preference curve \( LP \) becomes quite flat, i.e., perfectly elastic at a very low rate of interest. It is a horizontal line beyond the point \( E2 \) towards the right. This perfectly elastic portion of liquidity preference curve indicates the position of absolute liquidity preference of the people. That is, at very low rate of interest people will hold with them as inactive balances any amount of money they come to have. This portion of liquidity preference curve with absolute liquidity preference is called liquidity trap. It is termed as liquidity trap by economists because expansion in money supply gets trapped in this sphere and therefore cannot affect rate of interest and therefore the level of investment. According to Keynes it is because of the existence of liquidity trap that monetary policy becomes ineffective to tide over economic depression.

**The Supply of Money**

The supply of money is a stock at a particular point of time, though it conveys the idea of a flow over time. The supply of money at any moment is the total amount of money in the economy. There are three alternative views regarding the definitions or measures of money supply. The most common view is associated with the traditional and Keynesian thinking which stresses the medium of exchange function of money. According to this view, money supply is defined as currency with the public and demand deposits with the commercial banks. Demand deposits are savings and current accounts of depositors in a commercial bank. They are the liquid form of money because depositors can draw cheques for any amount lying in their accounts and the bank has to make immediate payment on demand. Demand deposits with the commercial bank plus currency with the public are together denoted as \( M1 \), the money supply. This is regarded as the narrower definition of the money supply.

The second definition is broader and is associated with the modern quantity theorists headed by Friedman. Prof. Friedman defines the money supply at any moment of time as “literally the number of dollars people are carrying around in their pockets, the number of dollars they have to their credit at banks or dollars they have to their credit at banks in the form of demand deposits, and also commercial bank time deposits”. Time deposits are fixed deposits of customers in a commercial bank. Such deposits earn a fixed rate of interest varying with the time period for which the amount is deposited. Money can be withdrawn before the expiry of that period by paying a penal rate of interest to the bank. So time deposits possess liquidity and are included in the money supply by Friedman. Thus the definition includes \( M1 \).
plus time deposits of commercial banks in the supply of money. This wider definition is termed as M2 in America and M3 in Britain and India. It stresses the store of value function of money.

The third function is the broadest and is associated with Gurley and Shaw. They include in the money supply, M2 plus deposits of saving banks, building societies, loan associations, and deposits of other credit and financial institutions.

**Measures of Money Supply in India**

There are four measures of money supply in India which are denoted by M1, M2, M3, and M4. This classification was introduced by Reserve Bank of India (RBI) in April, 1977. Prior to this till March, 1968, the RBI published only one measure of money supply, M or M1 which is defined as currency and demand deposits with the public. This was in keeping with the traditional and Keynesian views of the narrow measure of money supply.

From April, 1968 the RBI also started publishing another measure of the money supply which is called Aggregate Monetary Resources (AMR). This included M1 plus time deposits of banks held by the public. This was a broad measure of money supply which was in line with Friedman’s view.

Since April, 1977, the RBI has been publishing data on four measures of the money supply which are cited below:

**M1** – The first measure of money supply M1 consists of:

- Currency with the public which includes notes and coins of all denominations in circulation excluding cash in hand with banks;
- Demand deposits with commercial and co-operative banks, excluding inter-bank deposits; and
- ‘Other deposits’ with RBI which include current deposits of foreign central banks, financial institutions and quasi-financial institutions such as IDBI, IFCI, etc. RBI characterizes M1 as narrow money.

**M2** – The second measure of money supply M2 consists of M1 plus post office savings bank deposits. Since savings bank deposits commercial and co-operative banks are included in the money supply, it is essential to include post office saving bank deposits. The majority of people in rural and urban areas have preference or post office deposits from the safety viewpoint than bank deposits.

**M3** – The third measure of money supply in India M3 consists of M1 plus time deposits with
commercial and cooperative banks, excluding interbank time deposits. The RBI calls M3 as broad money.

**M4** – The fourth measure of money supply M4 consists of M3 plus total post office deposits comprising time deposits and demand deposits as well. This is the broadest measure of money supply.

Of the four inter-related money supply for which the RBI publishes data, it is M3 which is of special significance. It is M3 which is taken into account in formulating macroeconomic objectives of the economy every year.

**Determinants of Money Supply**

In order to explain the determinants of money supply in an economy we shall use the M1 concept of money supply which is the most fundamental concept of money supply. We shall denote it simply by M rather than M1. As seen above this concept of money supply (M1) is composed of currency held by the public (Cp) and demand deposits with the banks (D). Thus;

\[ M1 = Cp + D \]  

Where
- \( M \) = Total money supply with the public
- \( Cp \) = currency with the public
- \( D \) = demand deposits held by the public.

The two important determinants of money supply as described in equation (1) are; the amounts of high-powered money which is also called Reserve money by the Reserve Bank of India and;

(2) the size of money multiplier.

**1. High-powered money (H)**

The high-powered money consists of the currency (notes and coins) issued by the government and the RBI. A part of the currency issued is held by the public, which we designate as \( Cp \) and a part is held by the banks as reserves which we designate as \( R \). A part of these currency reserves of the bank is held by them in their own cash vaults and a part is deposited in the Reserve Bank of India in the reserve accounts which banks hold with RBI. Accordingly, the high-powered money can be obtained as sum of currency held by the public and the part held by the banks as reserves. Thus,

\[ H = Cp + R \]  

Where \( H \) = the amount of high-powered money
C_p = Currency held by the public  
R = Cash reserves of currency with the banks.

It is to be noted that RBI and Government are the producers of the high-powered money and the commercial banks do not have any role in producing this high-powered money (H). However, the commercial banks are producers of demand deposits which are also used as money like currency. But for producing demand deposits or credit, banks have to keep with themselves cash reserves of currency which have been denoted by R in equation –(2) above. Since these cash reserves with the banks serve as a basis for the multiple creation of demand deposits which constitute an important part of total money supply in the economy. It provides high poweredness to the currency issued by the Reserve Bank and the Government.

The theory of determination of money supply is based on the supply of and demand for high powered money. Some economists call it ‘The H Theory of Money Supply’. However, it is more popularly called ‘Money Multiplier Theory of Money Supply’ because it explains the determination of money supply as a certain multiple of the high powered money. How the high powered money is related to the total money supply is graphically depicted in the following figure.

![Diagram of Money Supply]

The base of the figure shows the supply of high powered money (H) while the top of the figure shows the total stock of money supply. It will be seen that the total stock of money supply is determined by a multiple of the high powered money. It will be further seen that
where as currency held the public(Cp) uses the same amount of high powered money, ie, there is one-to-one relationship between currency held by the public and the money supply. In contrast to this, bank deposits are a multiple of the cash reserves of the banks (R) which are part of supply of high powered money. That is, one rupee of high powered money kept as bank reserves give rise to much more amount of demand deposits. Thus the relationship between money supply and the high powered money is determined by the money multiplier. The money multiplier which we denote by ‘m’ is the ratio of total money supply (M) to the stock of high powered money. That is:

\[ m = \frac{M}{H} \]

The size of money multiplier depends on the preference of the public to hold currency relative to deposits (ie. ratio of currency to deposits which we denote by K) and bank’s desired cash reserves ratio to deposits (which we call r)

It follows from above that if there is increase in currency held by the public which is a part of the high powered money, with demand deposits remaining unchanged, there will be direct increase in the money supply in the economy. If currency reserves held by the banks increase, this will not change the money supply immediately but will set in motion a process of multiple creation of demand deposits of the public in the banks. Although banks use these currency reserves held by them, which constitute a part of the high powered money, to give more loans to the businessmen and thus create demand deposits, they do not affect either the amount of currency held by the public or the composition of high powered money. The amount of high powered money is fixed by the RBI by its past actions.

**Money Multiplier**

As we stated above, money multiplier is the degree to which money supply is expanded as a result of the increase in high powered money. Thus

\[ m = \frac{M}{H} \]

Rearranging this we have

\[ M = H \cdot m \]

Thus money supply is determined by the size of money multiplier(m) and the amount of high powered money (H).