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B.A. ECONOMICS
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Macro Economics-I
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Macro Economics - I

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UNIT – I

NATIONAL INCOME

1.1. Introduction

National income is one of the basic aggregate measures in Macroeconomics, which provides a comprehensive objective measure of welfare of the people. National income is the market value of final goods and services produced in an economy over a specific time period (usually a year). The importance of measurement of national income can be known from the fact that two Nobel prizes (to Simon Kuznets in 1971 and to Richard Stone in 1984) were largely awarded for their contribution to the development of national income accounts. An aggregate measure of economic welfare of the people is useful for understanding economic relation and formulating economic policy. Economists use this aggregate measure to improve their understanding of economic activities, and also to measure the welfare impact of different factors. In absence of an aggregate measure of economic welfare, the government policies cannot be evaluated, and the policy decisions will have to be based on subjective valuation of policy makers rather than scientifically established facts. Therefore, it is crucial to have a quantitative and objective measure of welfare. The problem of using a subjective measure is that it is prone to be misused by researchers to prove their point of view as well as by policy makers to impose their own point of view on others without a sound reasoning. Besides, a qualitative measure cannot fully capture temporal changes or regional differences, which are required to measure the effect of economic policies. The value of final goods and services produced in the economy provides an objective and quantifiable measure of economic welfare. The economic welfare of the people largely depends on quantity of goods and services available to them for consumption. In addition, the production of capital goods represents the future improvements in consumption. Hence, the value of consumption and capital goods produced is a measure of productive activities in an economy. However, the quantity of goods and services cannot be simply added, as the welfare impact of each good and service is different. To overcome this problem, the measure is based on value of goods and services rather than their quantity. Here, price of goods

and services acts as a weight to combine their quantities. The aggregate value so obtained is used to estimate various concepts of national income, such as, Gross Domestic Product (GDP), Gross National Product (GNP), Net Domestic Product (NDP) and Net National Product (NNP). In addition, familiarity with the methods of measuring national income is also required for understanding the various concepts. The present chapter provides a basic understanding of all the three issues related to estimation of national income. The chapter is divided into seven sections. After the discussion on meaning of national income in the second section, the third section discusses the differences between real and nominal income. The understanding of nominal and real income will be helpful in understanding the relation between national income concepts and economic welfare more clearly. The fourth section discusses the basic concepts of national income. The details of three methods of measuring national income are provided in the fifth section. The limitations of the national income concepts are given in the sixth section. The last section summarizes the chapter.

1.2. Definition of National Income:

National income is the sum of a country's final output of all new final goods and services produced in one year by the productive system of an economy.

Marshall defines national income or national dividend in the following way: "The labour and capital of a country, acting on its natural resources, produce annually a certain net aggregate of commodities, material and immaterial including services of all kinds… This is the true net annual income or revenue of the country or national dividend."

The important ones which need to be discussed here are: (1) how to avoid double counting, (2) what is to be included in the calculation of national income and what is not to be, (3) how to measure the contribution of goods and services produced by government, and (4) how to include change in inventories and unsold stock? First of all, only value of final goods and services are included in the calculation of national income. Inclusion of intermediate goods leads to double counting as the price of final product will also include price of all inputs. It must be noted that capital goods are also used in the production process; nonetheless, they are considered as final

product because capital goods (unlike, raw material and other inputs) are not completely consumed in the production process. Their contribution is equal to their depreciation. In addition, non-market production activities are also not included in national income. For example, the services of a house-wife are not a part of national income, whereas the same services if provided by a maid become a part of national income. The reason for not including non-market services is due to the difficulty in estimation of its value in the absence of a market price. However, the value of some of the non-marketed goods is included. The imputed value of rent of owner-occupied houses, wage in kind, and self-consumed agricultural production is included in the measurement of national income. Their value is calculated based on the market value of similar goods and services. The market price also does not exist for goods and services provided by the government. Therefore, the cost of their production is taken as their contribution to national income. Any resale of good is not included in the national income. However, the service provided to facilitate the resale is included in the national income. The resale of a good is just a transfer of property and no new production activities are involved. However, the service provided by a broker is a new production. Similarly, the transfer payments are not included in national income, as it is an income earned by someone else, and including it will lead to double counting. Further, the illegal activities are not included in the national income.

For instance, if alcohol consumption is illegal in a country, it will not be in included in national income. However, it will be included if the government lifts the ban on its consumption. The change in inventories is also included in the national income calculation. For example, if there is an increase in unsold items, stock of raw material etc. at the end of the year, then the addition in inventories is added in the national income. Most commonly used concepts of national income are Gross Domestic Product and Gross National Product along with their closely related concepts of Net Domestic Product and Net National Product. In addition, concepts of Personal Income and Disposable Income are also used. The following subsections provide details of these concepts.

1.3. Factors Affecting National Income

I. Resource Allocation:

This is based on the physical capacity of factors of production and the given technology. The more efficient and effective factors of production leads to better National Income as the total productivity of the nation increases. Hence every nation strives to get better factors of production.

1) Land Resources: The geographical location of the natural resources also affects the level of National income. That is the areas rich in coal, iron and other such essential items affect the level of GNP of the nation.

2) Labor: The quality of human resource today affects the standard of a nation today. The productivity of labor is more important than quantity

3) Capital: Capital is generally determined by investment which in turn depends on other factors like profitability, political stability etc.

4) Technology: In addition to natural resources and labour the level of invention and innovation in production affect the productivity of the factors of production. Thus, the per capita output grows with the help of technology.

II. Government:

Government is the key resource to provide a favorable business environment and hence it affects the productivity of the nation and in turn affects the National Income of an economy. Although, Classical believe that the government is an impediment to growth in output.

III. Political Stability:

The political system of a nation affects the stability of an economy. A stable economy in turn increases the productivity and the national income of a nation. Unfavorable business environment encourages problems like wars, strikes and other social unrests which discourage economic development.

1.4. National Income Accounting

a. Gross Domestic Product (GDP):

GDP is the total value of goods and services produced within the country during a year. This is calculated at market price and is known as GDP at market prices. There are 3 methods to calculate GDP at market price:

1. The income method, under this method all incomes received by the factors of production generated in the economy during a year are added together. It

includes payment for wages on both employment and self-employment, profits, interest to lenders on capital or rents to owners of land.

2. The output method/product method, under this method the combined amount of the new and final output produced in different sectors of the economy, including manufacturing, financial services, transport, leisure and agriculture is taken into account.

3. The expenditure method, under this method all spending of the economy by households and firms on new and final goods and services by households and firms are added together to calculate the national income of an economy.

National Income Aggregates: Value of Gross output = Price * Quantity of all goods and services produced in the country (not adjusted for bought out inputs).

Since prices differ: Gross output = $\sum PiQi\ n\ i$=1

Net output = Gross output – Value of bought out input (like value of raw materials purchased).

Net output = Gross output. Therefore, Net National Output = Gross national product.

If GNP is adjusted for income earned from abroad: GNP – Net income earned from abroad = Gross domestic Product (measured at market prices = $GDPmp$

b) Gross Domestic Product at Factor Cost (GDPfc)

GDP at factor cost is the net value added by all producers within the country.

GDP at Factor Cost = $GDPmp$ - Indirect taxes + subsidies = $GDPfc$

c) Net Domestic Product (NDP)

NDP is the net output of the nation during the year. Capital assets wear out or becomes obsolete each year during the production process. Thus, Net Domestic Product = GDP at Factor cost – Depreciation = $NDPfc$

d) Nominal and Real GDP: When GDP calculated on current price, is called GDP at current prices or nominal GDP. While, when GDP is calculated on the basis of fixed prices in some previous year, it is called GDP at constant prices or real GDP. It measures the value of goods and services by ignoring the changes in the price level. To find out the real GDP, a base year is chosen when the general price level is normal, i.e., it is neither too high nor too low. The prices are adjusted on 100 (or 1) in the base year.

Real GDP (at base year prices) = GDP for the current year * Base Year Index (=100) /Current Year Index

Suppose 2000-01 is the base year and GDP for 2014-15 is Rs. 6, 00,000 crores and the price index for this year is 300 (2014-15 index). Thus, Real GDP for 2000-01 = Rs. 6, 00,000 x 100/300 = Rs. 2, 00,000 crores. Thus, real GDP (at constant prices) = GDP (at current prices)/GDP Deflator

e) GDP Deflator:

GDP deflator is a barometer of price changes of goods and services included in GDP. It is a price index which is calculated as follows

GDP Deflator=Nominal (or current prices) GDP / Real (or constant prices) GDP *100

f) Gross National Product (GNP)

GNP is the total difference in the flow of goods and services at market value resulting from current year's production of a country. It also includes the net income from abroad.

GNP includes the following final goods and services (1) Consumers' goods and services which satisfies the wants and demand of people; (2) Gross investment in capital goods consisting of total capital formation, household construction and inventories of finished and unfinished goods; (3) Goods and services manufactured by the government and its organizations; (4) Net exports of goods and services, i.e., the difference between value of exports and value of imports of goods and services, known as Net Income from abroad (NIA).

g. Personal Income (PI) and Disposable Income (DI)

Personal income (PI) is the total income received by the residents from all sources. It includes wage income, fees, rent, earning from interest, commission, profits, bonus, dividends and transfer payments. If personal taxes are deducted from Personal income, then one gets Disposable Income (DI). Following identities show the relationship of PI with NNP and DI.

PI = NNP at factor cost – Retained corporate profits – Corporate Tax – Income of Public Sector + Transfer Payments

DI = PI – Personal Taxes

1.5. National Income Estimation

There is a difference between National Income Accounting and National Income Estimation. Accounting tells us how to derive one NI aggregate from the other. National Income Estimation tells us how to calculate NI. But we do not use the term calculation because very often the enumerators who calculate national income have to use methods of estimation (or even guess estimates) for assessing the production or income generated during one year.

Precautions in National Income Estimation:

The factors to be taken into consideration while estimating National Income:

1) Money value considered: GNP is the sum of money, in which all kinds of goods and services manufactured in a country during one year are measured in terms of money at current prices and then added together. But in this manner, due to the fluctuations in the prices, the GNP is increased or declined, which may not be real. To guard against erring on this account, a particular year (base year) when prices are normal is taken and the GNP is adjusted in accordance with the index number for that year.

2) Avoid double counting: In estimating GNP, the market price of only the final products should be considered. Many of the products pass through different number of stages before they are ultimately purchased by consumers. If these products are counted and calculated at every stage, they would be included many a time in the national product. Consequently, the GNP would increase too much. To avoid double counting, therefore, only the final products and not the intermediary goods should be taken into account.

3) Avoid non-market value: Goods and services given free of cost are not included in the GNP, because it is not difficult to have a correct estimation of their market value or price. For example, the bringing up of a child by the mother, giving instructions to his son by a teacher, recitals to his friends by a musician, etc.

4) The transactions which do not arise in the current year or which do not contribute in any way to production are not included in the GNP. The sale and purchase of National Income: second hand goods, and shares, bonds and assets of existing companies are not included in GNP because these do not make any addition to the national product, and the goods are simply

transferred.

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

6) The profits earned or losses incurred due to fluctuations in market prices in the value of capital assets are not included in the GNP if they are not responsible for current production or economic activity. For example, if the price of a building or of a bare land increase due to inflation, the profit earned by selling it will not be a part of GNP. But if, during the current year, a portion of a house is constructed anew, the increase in the value of the house (after subtracting the cost of the newly constructed portion) will be adjusted in the GNP. Similarly, variations in the value of assets, that can be ascertained beforehand and are insured against flood or fire, are not included in the GNP.

7) The income earned in restricted activities are not to be included in the GNP. Though the goods sold in the black market are priced and fulfill the needs of the people, but as they are not useful from the social point of view, the income received from their sale and purchase is always excluded from the GNP.

g) GNP at Market Prices: To covert gross domestic product into national product, we must add the total income from abroad in to a nation. GNP at Market Prices = GDP at Market Prices + Net Income from Abroad.

h) GNP at Factor Cost: GNP at factor cost is the sum of the money value of the income produced by and accruing to the various factors of production in one year in a country.

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

i) Net National Product (NNP): NNP is sum total of output on consumption goods and investment goods. But this process of production uses certain amount of fixed capital and the fixed equipment wears out with time, or other components are damaged or destroyed, and still others are rendered obsolete through technological changes. NNP = GNP—Depreciation.

j) NNP at Market Prices: Net National Product at market prices is the sum total of final goods and services evaluated at market price in a country. Value

of final goods and services evaluated at market prices in a country. NNP at Market Prices = GNP at Market Prices—Depreciation.

k) NNP at Factor Cost: Net National Product at factor cost is the total output evaluated at factor prices. It includes income earned by factors of production through participation in the production process such as wages and salaries, rents, profits, etc. It is also called National Income. NNP at Factor Cost/ National Income = NNP at Market Prices – Indirect taxes+ Subsidies

Uses of National Income Statistics

1) Standard of living: one can easily compare the standard of living of different nations with the help of GNP. Hence National income statistics can be used for analyzing the standard of living of a nation.

2) Policy Formulation: The National income statistics are used to compile GNP statistics of the economy. The Government then uses this data for policy formulation.

3) International comparison: The standard of living of different nations can be compared with national income statistics which in turn helps to show the rate of growth or development of different nations.

4) Business Decisions: The level of development of different industries and sectors respectively of an economy is analyzed with national income statistics. It in turn helps the business to plan for production and planning.

1.6. Measurement of National Income

Though the concept of national income is defined as the value of final goods and services, practically it can be measured using one of the following three Methods: A. Value Added Method (also known as Product Method) B. Factor Income Method C. Expenditure Method. All methods provide the same estimates. The income paid to the factor of production is equal to value addition, and the total expenditure on goods and services is equal to income earned by the factors of production. These methods are used to arrive at the estimates for GDP at market price, and then adjusted for NFPA, depreciation, indirect taxes and price change to arrive at arrive at other concepts.

A. Value Added Method (or) Product Method

At each stage of production certain value is added to the product, which represents the contribution of labour and capital at that stage. The value

addition at any stage of production includes cost of labour, profits and depreciation. The production of goods also requires many intermediate products, which are used up in the production process. Though the cost of intermediate product adds to price, their contribution to the price does not represent the value addition as they have already been produced. Therefore, the cost of intermediate is deducted from the price of final product to obtain the value added. GDP can be calculated by adding the gross value of all products (intermediate and final) and then deducting their cost of production. The whole process is done in three stages. In the first stage, the gross value of all goods and services is estimated. To obtain the gross value added, the various sectors are classified under different categories. Then, the gross value is estimated for each category by multiplying the output of each sector to their market price. The gross value of each category is then added to obtain aggregate gross value of all sectors. In addition, the record of the firms can also be used to get information about total value of sales and inventories. Here, one must be careful to include self-consumption of agricultural production and imputed rent of owner-occupied houses. In the second stage, the estimates for the production costs and depreciation are generated. Estimation of production cost and depreciation is a complicated process. The information on inputs is used for sectors, where it is easy to obtain. In other cases, the cost is based on the estimates of inputs cost as a share of output. The depreciation is generally estimated as a certain percentage of gross value based on some accepted norms about depreciation. After obtaining the estimates of gross value, input cost and depreciation, GDP is calculated, in the third stage, by deducting input cost from gross value, and NDP is obtained by deducting depreciation from GDP.

B. Factor Income Method

Factor income method is using payment to the factors of production to arrive at GDP estimates. So, the national income is the sum of three types of income earned by people, namely, labour income, capital income (or non labour income) and mixed income. Labour income includes the income compensation labour income) and mixed income. Labour income includes the income compensation of employee including bonus and employer's

contribution to provident fund. Capital income includes retained profits of corporates, dividends, interest, rent, royalties, and surplus of public sector enterprises. Mixed income has features of both labour as well as capital income, thus cannot be assigned a category. It includes income of proprietors, self-employed doctor, lawyers etc. The sum of these incomes provides NNP at market price, which are used to calculate GDP, NDP and GNP.

C. Expenditure Method

In an economy, three agencies, households, firms and government, are involved in economic activities and purchase goods and services from each other. Expenditure method is based on the total spending of these three agencies on final goods and services produced with a year. The spending of households, firms and government is termed as consumption (C), investment (I) and government consumption (G), respectively. The consumption of these agencies also included imports, whereas the exported goods, though produced within the country, are consumed in foreign countries, therefore, the exports (X) are added to total expenditure and imports (M) are deducted to obtain GDP estimates. The GDP is then used to estimate other concepts.

$$\text{GDP at Market Price} = \mathbf{C} + \mathbf{I} + \mathbf{G} + \mathbf{X} - \mathbf{M} \quad \ldots (10)$$

1.7. Nominal vs. Real Income GDP

When GDP calculated on current price, is called GDP at current prices or nominal GDP. While, when GDP is calculated on the basis of fixed prices in some previous year, it is called GDP at constant prices or real GDP. It measures the value of goods and services by ignoring the changes in the price level. To find out the real GDP, a base year is chosen when the general price level is normal, i.e., it is neither too high nor too low. The prices are adjusted on 100 (or 1) in the base year.

The change in national income is the result of combined effect of quantity and price change. However, the economic welfare depends only on quantity change and the price increase (decrease) does not lead to welfare increase (decrease). For instance, the welfare effect of a good or service does not increase with just because its price has increased. Only way to increase the welfare is by increasing the production of the good or service. Therefore, the effect of price change on value of production must be removed. The market

price-based value of production provides nominal income change, whereas the price adjusted value shows real change in income. Let us take the case of single good to clarify the point. Suppose, wheat is the only commodity produced in an economy. Therefore, the income estimate must be based on wheat production alone. In one of the years, the price of wheat is Rs. 100 per tonne and 20 million tonne wheat is produced. Based on these two figures, the value of wheat produced is Rs. 2,000 million (or two billion). Now compare the two possible scenarios for the next year. In first scenario, the price of wheat increases to Rs. 110, whereas the production remains the same. In the second scenario, price of wheat remains the same (that is, Rs. 100 per tonne), however, the production of wheat increases from 20 million tonne to 22 million tonne. In both the cases, the value of production will increase to Rs. 2,200 million, showing 10 percent improvement in the value. However, the two scenarios are fundamentally different. In the first case, there is no real improvement in welfare of the people as the production of wheat has remained the same. On the other hand, the second scenario shows improvement in production, as more wheat is available to people for consumption. Remember, the economic welfare of the people depends on level of production and not on prices. In the above example, the value of production is a nominal income (or value). To obtain the real income, we have to calculate the value by keeping the price constant. For example, in the two scenarios discussed above, the real income in the first scenario is Rs. 2,000 million, as the old price of wheat (that is, Rs. 100 per tonne) is considered for calculating the value. The real income in the second scenario is Rs. 2,200 million, as the whole change was the result of change in production. Comparing the real income in the two scenarios, one can conclude that the second scenario represents welfare improvement, whereas there is no change in the first case. The above example considered two extreme cases, where either price or quantity was changed. In reality, both price and quantity changes simultaneously. For instance, the production may change from 20 million tonne to 22 million tonne and at the same time price may change from Rs. 100 per tonne to Rs. 110 per tonne. In this case, the nominal income will increase from Rs. 2,000 million to Rs. 2,420 million, whereas the real income will change from Rs. 2,000 million to Rs.

2,200 million. While determining the real income, the price for one of the years is considered as the base, and all other incomes are calculated by multiplying that base price with the quantity produced in respective years. Also note that, the real and nominal income is same for the base year. The above example is based on just one good. However, the same principle can be used the several goods and services. For example, suppose that there are n commodities with prices, $p10$, $p20$... $pn0$ and quantity produced, $q10$, $q20$... $qn0$ in the base period. Here, the first subscript number denotes the commodities number, and second represents time period with the base period written as '0'. For example, $p20$ is the price of the second commodity in time period '0' (i.e. base period). The value of production in the base year is $pi0qi0$ n i=1. Since it is base year, this value represents both nominal and real income. Let the quantities of n commodities produced in period '1' be $q11$, $q21$, ..., $qn1$ and their respective prices be $p11$, $p21$, ..., $pn1$. Then, the nominal income in the second case is $pi1qi1$ n i=1, whereas the real income is $pi0qi1$ n i=1. To calculate real income, one may also use price index. For instance, one can divide the nominal income $pi1qi1$ n i=1 with price index and multiply with 100 to obtain the real income. The price index used in case of national income is called implicit price deflator. We will further talk about it while discussing the various concepts of national income. Due to technical difficulties in measurement of national income using constant prices, implicit price deflator is more convenient way to calculate real national income.

1.8. GDP Deflator

The gross domestic product price deflator, or GDP deflator, is a price index that shows how, on average, prices for all goods and services produced in an economy change over time. It is commonly used to estimate the rate of inflation. The GDP gives the market value of all final goods and services currently produced within a country during a given time period. The items and quantities that enter into its calculation vary year by year, so it is a very current way to estimate inflation.

Significance of GDP Deflator

- It serves the specific purpose of giving the real GDP from the nominal GDP by deflating the price effect.

- It is used as a measure of inflation as it shows the extent to which the increase in GDP has happened on account of higher prices rather than an increase in output.
- It is the most general measure of the overall price levels.
- It takes into account changes in government consumption, capital formation, international trade and household consumption.
- GDP Deflator is not based on a fixed basket of goods and services, it covers the whole economy including services.
- Changes in consumption patterns or the introduction of goods and services are automatically reflected in the GDP deflator.

Calculation of GDP Deflator

GDP Deflator is calculated by dividing the nominal GDP by the real GDP and then the result is multiplied by 100.

GDP Deflator = (Nominal GDP / Real GDP) × 100

Nominal GDP captures the value of all goods and services at current prices, while real GDP is the valuation of the same at constant prices without the effect of inflation. GDP deflator is very similar to other indices like the Consumer Price Index (CPI) and Wholesale Price Index (WPI), but the only difference is GDP deflator is not based on a fixed basket of goods and services. It is determined on the basis of a dynamic basket- which covers all the goods and services in an economy.

1.9. Green GDP

A sustainable income can be defined as maximum attainable in a particular period with assurance or guarantee that the same level of income will be available in future periods given the resource constrains in form of labor, capital, man-made capital and natural capital. Therefore, measurement of environmentally sustainable income requires a system of natural accounts that integrates environmental and economic problems. According to the above definition of sustainable income, income is directly related to availability of man-made and natural capital. Income thus defined indicates welfare of the nation in spite of regressive discussions whether Net National Product (NNP) would adequately capture welfare of the nation. There have been number of discussions in search of meaningful welfare concepts, for example Samuelson

in 1961 rejected current income concepts such as NNP and suggested concept of wealth reflected in present discounted value of future consumption. Similarly, Weitzman 1976 indicated that Net National Product (NNP) is a proxy for present discounted value of future consumption. Studies by solo in 1974 Hartwick in 1977, 78 made an attempt to derive the conditions in which real consumption might be maintained along with depleting stocks of exhaustible resources like fossil fuels, minerals and metals.

Result of these studies are known as Hartwick rule which implies that the consumption may be held constant if exhaustible resources derive rents from inter-temporal efficient rule. This rule is based on the assumption of sustainability between man - made capital and natural capital. In this context Solo has shown that optimal inter temporal resource allocation of man-made capital requires maintain the existing capital stock by making investment equal to depreciation. The criticism of solo Hartwick notion sustainable income is the basic fundamental that manmade capital cannot be substituted for natural capital simply due to the fact that natural capital can be exploited by man but it can be created by man. The rankings of national happiness are derived from a global survey conducted by the polling company Gallup, Inc., known as the Cantril Ladder survey. In this survey, individuals are asked to envision a ladder, with a perfect life rated as ten and the worst possible life rated as 0. They are then asked to assess their current lives on these 0 to 10 scales. The report analyses these evaluations and correlates them with various life factors. The life factor variables employed in the report reflect determinants commonly associated with disparities in national-level life evaluations. However, some variables, such as unemployment and inequality, are excluded due to the unavailability of comparable data across all countries. The adoption of subjective measurements of well-being represents a bottom-up approach, empowering respondents to evaluate their well-being. The Cantril Ladder is valuable in this context as it allows respondents to anchor their assessment based on their perspectives.

Each report is structured into chapters that delve deeper into happiness-related issues, such as mental health, the tangible benefits of happiness, the role of ethics, policy implications, and connections to the

Organization for Economic Co-operation and Development's (OECD) approach to measuring subjective well-being, as well as other international and national initiatives. Starting in 2021, the World Happiness Report has argued for using WELLBYs (Well-Being-Adjusted Life-Years) as a superior measure. Quality-Adjusted Life Years (QALYs) primarily measure an individual's health-related quality of life, while WELLBYs (Well-Being-Adjusted Life-Years) provide a broader assessment by considering overall well-being, emphasizing not just health but the individual's general life satisfaction and happiness.

1.10. Circular Flow of Income Expenditure:

1.10.1. Introduction:

Macroeconomics is the branch of economics that studies the economic behaviour of all the agents in the economy; i.e. it is the study of the economy as a whole. In other words, macroeconomics is the study of aggregate outcomes of the decisions taken by the different agents in an economy. To begin the study of basic macroeconomics let us introduce the concept of the circular flow of Income. The circular flow of income forms the basis for all the macroeconomic models of the economy and it is imperative to understand the circular flow model for understanding essential concepts like national income, aggregate demand and aggregate supply. The circular flow of income describes the movement of goods or services and income among the different sectors of the economy. It illustrates the interdependence of the sectors and the markets to facilitate both real and monetary flow. The real flow refers to the flow of factor services and flow of goods and services. The flow of factor services from the households to the firms and the flow of goods and services from firms to the household is the real flow. The flow of factor services generates money flows in the form of factor payments which the firms pay the household and similarly the household need to pay the firms for the flow of goods and services. The movement to the money/cash payment from one sector to the other sector corresponding to the real flow is referred to as the monetary flow. Thus, the income of one sector becomes the expenditure of the other and the supply of goods and services by one sector becomes the demand of the other sector. The real flow and monetary flow move in a circular manner in an opposite direction. A continuous flow of production, income and expenditure

is known as the circular flow of income. There are Four Macroeconomic Sectors it bellows.

a. The Household Sector:

This sector includes all the individuals in the economy. The primary function of this sector is to provide the factors of production. The factors of production include land, labour, capital and enterprise. The household sectors are the consumers who consume the goods and services produced by the firms and in return make payments for the same.

b. The Firms Sector:

This sector includes all the business entities, corporations and partnerships. The primary function of this sector is to produce goods and services for sale in the market and make factor payments to the household sector.

c. The Government Sector:

This sector includes the center, state, and local governments. The prime function of this sector is to regulate the functioning of the economy. The government sector incurs both revenue as well as expenditure. The government earns revenue from tax and non-tax sources and incurs expenditure for provide essential public services to the people.

d. The Foreign Sector

This sector includes transactions with the rest of the world. Foreign trade implies net exports (exports minus imports). Exports include goods and services produced domestically and sold to the rest of the world and imports include goods and services produced abroad and sold domestically.

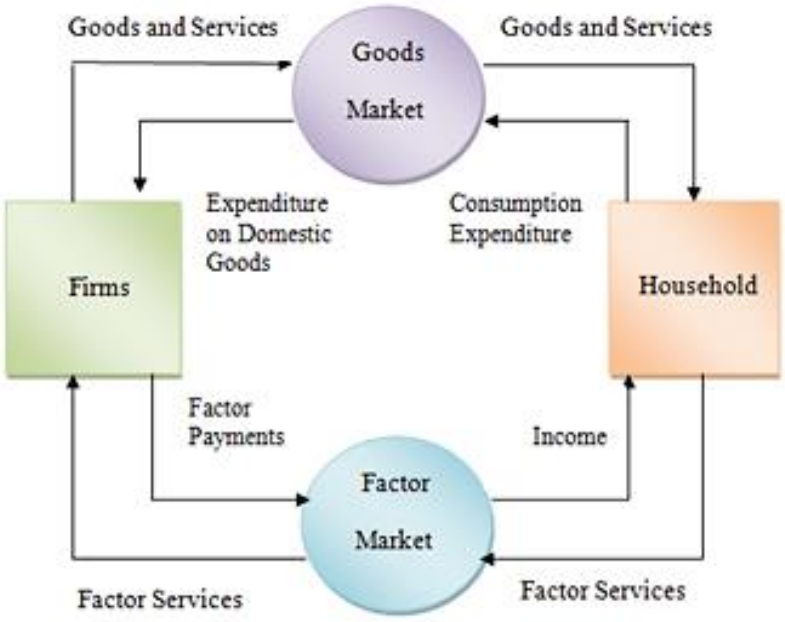
The Three Markets:

a. The Goods Market: In this market the goods and services are exchanged among the four macroeconomic sectors. The consumers are the household, government and the foreign sector while the producers are the firms.
b. The Factor Market: The factors of production are traded through this market. For the production of final goods and services, the firms obtain the factor services and make payments in the form of rent, wages and profits for the services to the household sector.

c. The Financial Market: This market consists of financial institutions such as banks and non-bank intermediaries who engage in borrowing (savings from households) and lending of money.

1.10.2. The Circular Flow of Income in a Two-Sector Model

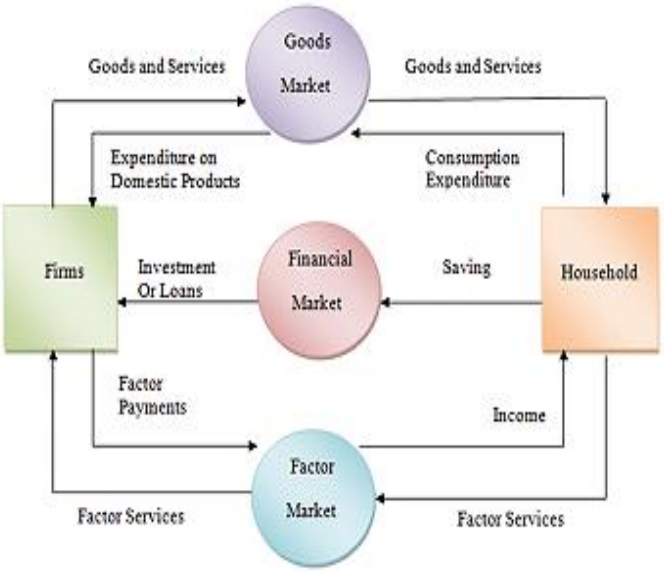
In this model, the economy is assumed to be a closed economy and consists of only two sectors, i.e., the household and the firms. A closed economy is an economy that does not participate in international trade. In this model, the household sector is the only buyer of the goods and services produced by the firms and it is also the only supplier of the factors of production. The household sector spends the entire income on the purchase of goods and services produced by the firms implying that there is no saving or investment in the economy. The firms are the only producer of the good and services. The firms generate income by selling the goods and services to the household sector and the latter earns income by selling the factors of production to the former. Thus, the income of the producers is equal to the income of the households is equal to the consumption expenditure of the household. The demand of the economy is equal to the supply. In this model, Y = C where, Y is Income and C is Consumption. The circular flow of income in a two-sector model is explained with the help of the following diagram, called Model 1.



Model 1: Circular Flow of Income in a Two Sector Model

The Circular Flow of Income in a Two- Sector Model with Saving and Investment

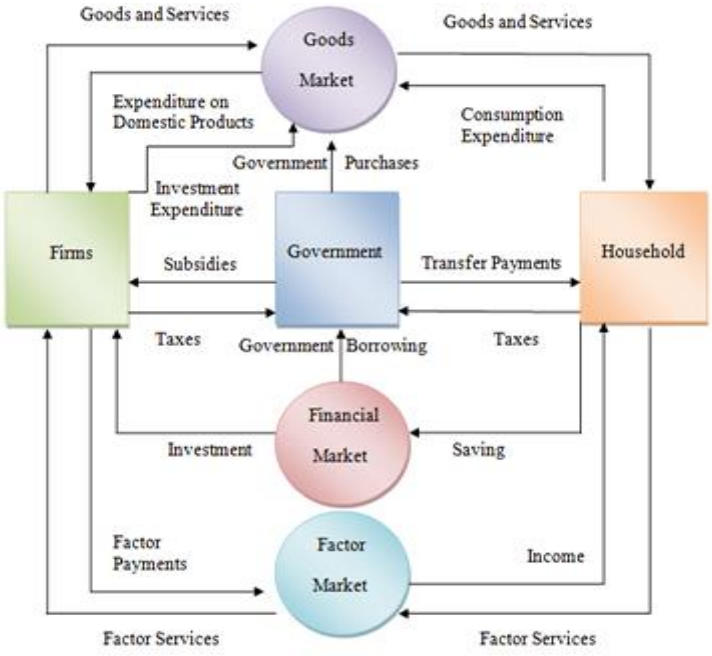
In the above model, we assumed that the household sector spends its entire income and that there is no saving in the economy however, in practice, the household sector does not spend all its income; it saves a part of it. The saving by the household sector would imply monetary withdrawal (equal to saving) from the circular flow of income. This would affect the sale of the firms since the entire income of the household would not reach the firm implying that the production of goods and services would be more than the sale. Consequently, the firms would decrease their production which would lead to a fall in the income of the household and so on. There is one way of equating the sales of the firms with the income generated; if the saving of the household is credited to the firms for investment, then the income gap could be filled. If the total investment (I) of the firms is equal to the total saving (S) of the household sector then the equilibrium level of the economy would be maintained at the original level. This is explained with the help of the following diagram, called Model 1a. The equilibrium condition for a two-sector model with saving and investment is as follows: Y = C + S or Y = C + I or C + S = C + I or, S = I Where, Y = Income, C = Consumption, S = Saving and I = Investment.



Model 1.1: Circular Flow of Income in a Two Sector Model

1.10.3. The Circular Flow of Income in a Three – Sector Model

The three sector model of circular flow of income highlights the role played by the government sector. This is a more realistic model which includes the economic activities of the government however; we continue to assume the economy to be a closed one. There are no transactions with the rest of the world. The government levies taxes on the households and the firms and it also gives subsidies to the firms and transfer payments to the household sector. Thus, there is income flow from the household and firms to the government via taxes in one direction and there is income outflow from the government to the household and firms in the other direction. If the government revenue falls short of its expenditure, it is also known to borrow through financial markets. This sector adds three key elements to the circular flow model, i.e., taxes, government purchases and government borrowings. This is explained with the help of the following diagram called, Model 2.



Model 2: Circular Flow of Income in a Three Sector Model

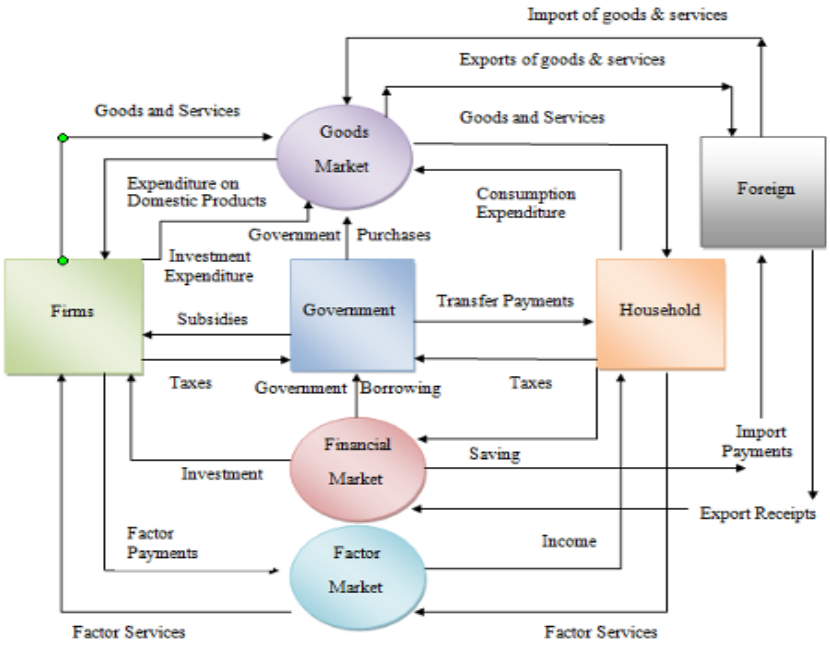
In this model, the equilibrium condition is as follows: Y = C + I + G

Where, Y = Income; C = Consumption; I = Investment and G = Government Expenditure. In a closed economy, aggregate demand is measured by adding consumption, investment and government expenditure. Thus, aggregate demand is defined as the total demand for final goods and services in an economy at a given time and price level and aggregate supply is defined as the

total supply of goods and services that the firms are willing to sell in an economy at a given price level.

1.10.4. The Circular Flow of Income in a Four Sector Model:

This is the complete model of the circular flow of income that incorporates all the four macroeconomic sectors. Along with the above three sectors it considers the effect of foreign trade on the circular flow. With the inclusion of this sector the economy now becomes an 'open economy'. Foreign trade includes two transactions, i.e., exports and imports. Goods and services are exported from one country to the other countries and imports come to a country from different countries in the goods market. There is inflow of income to the firms and government in the form of payments for the exports and there is outflow of income when the firms and governments make payments abroad for the imports. The import payments and export receipts transactions are done in the financial market. This is explained with the help of a following diagram, called Model 3.



Model 3: Circular Flow of Income in a Four Sector Model

In this model, the equilibrium condition is as follows:

$Y = C + I + G + NX$

NX = Net Exports = Exports (X) – Imports (M)

Where, Y = Income; C = Consumption; I = Investment; G = Government Expenditure; X = Exports and M = Imports.

1.10.5. Leakages and Injections in the Circular Flow of Income:

The flow of income in the circular flow model does not always remain constant. The volume of income flow decreases due to the leakages of income in the circular flow and similarly, it increases with the injections of income into the circular flow.

Leakages: A leakage is referred to as an outflow of income from the circular flow model. Leakages are that part of the income which the household withdraw from the circular flow and is not used to purchase goods and services. This part of the income does not go to the goods market. There are three main leakages and these are:

- **Saving**: It is that part of the income that is not used by the household to purchase of goods and services or pay taxes. It is kept with the financial institutions like banks that can be lend further by the banks to the firms for investment or capital expansion purposes.
- **Taxes**: Tax revenue is the income paid by the household and firms to the government. It flows to the government rather that the goods market.
- **Imports**: Import payments are made to the foreign sector for the good and services bought from them. This is an outflow of income from the economy.

Thus, we see that leakages reduce the volume of income from the circular flow of income. Leakages = S + T + M Where, S = Saving; T = Taxes; and M = Imports.

Injections: An injection is an inflow of income to the circular flow. The volume of income increases due to an injection of income in the circular flow. There are three main injections and these are:

Investment: It is the total expenditure by the firms on capital expansion. It flows to the goods market.

- **Government Expenditure**: It is the total expenditure of the government on goods and services, subsidies to the firms and transfer payments to the household sector. Transfer payments are government payments like social security schemes, pensions, retirement benefits, and temporary aid to needy families etc.
- **Exports**: Export receipts are the payment made by the foreign sector for the purchase of domestic goods. It is an inflow of income from the foreign

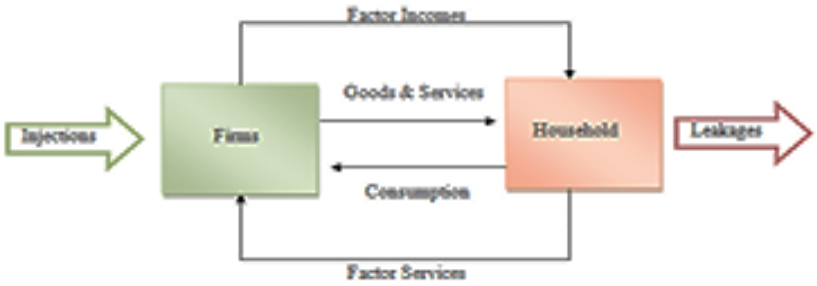
sector to the financial market.

Injections = I + G + X Where, I = Investment; G = Government Expenditure; and X = Exports.

Balance of leakages and Injections in an open economy is;

$$S + T + M = I + G + X \text{ or, } (S - I) = (G - T) + (X - M)$$

The leakages and injections can be shown with the help of the following diagram called, Model 4.



Model 4: The Leakages and Injections in the Circular Flow of Income

1.11. Limitations of National Income

Concepts National income concepts are extensively used by economists and policy makers in their different forms. Per capita GDP is widely used to compare the economic welfare of the people over time and among different countries. However, there are a number of limitations of using these concepts to measure welfare. A major share of productive activities is left because non-market activities of a household are not included in the national income accounting. However, the same activities are included if they are exchanged in the markets. For example, the services of a house-wife are not included in national income, whereas the same services, if provided by a maid, are added. Therefore, the national income of a country with a large share of non-market production will be underestimated. Paul Samuelson, a renowned economist and winner of 1970 Noble Prize in Economics, famously joked that GDP will decline if a professor marries his maid. The activities declared illegal and black-market transactions are also not included in national income. Using the cost of production for government services also leads to miscalculation of national income. Since the production of goods and services by government often involves significant production and allocative inefficiencies, they are

likely to be of less value to the people than the cost of their production. Therefore, using cost of their production leads to overestimation of national income. Further, national income does not provide information on distributional aspect of income, which is often equally important from welfare point of view. These limitations, however, does not render the concept of national income unimportant. Despite the criticism of national income concepts, they have remained one of the most important indicators to measure economic welfare and progress. Also, the efforts were made in the form of United Nations System of National Accounts (SNA) to provide internationally agreed standards on measuring of economic activity so that comparable national income estimates can be created for all countries. The first set of SNA standards were published in 1953, which were updated from time to time.

1.12. Summary

GDP and GNP are the most important measures of national incomes used to measure progress of an economy as well as improvement in the living standard of the people. The national income, when measured at market prices, includes the effect of production change as well as price changes. To measure the real change in welfare the effect of price change is removed using implicit price deflators, so that the national income figure only represents the production changes or welfare change. The national income estimates can be generated by taking the sum of value added during the production process, or income earned by the factors of production, or the expenditure of households, firms and government. All three methods provide same estimates of national income. Though the national income concepts have some limitation, it is widely used indicator for measuring welfare and progress.

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UNIT – II

FULL EMPLOYMENT: CLASSICAL THEORY

2.1. Introduction

Classical and Keynesian are two economic schools of thought that take a very different approach to study of monetary policy, government spending and consumer behaviour. Classical economics has its origins in the book The Wealth of Nations by Adam Smith in 1776. Classical economic theory believes in Lassiez-faire or free market. It believes that markets will work efficiently if there is little to no government intervention. It lays stress on the fact that individuals acting in their own self-interest will lead to efficient working of the economy as a whole. As such, government spending in not a major part of classical theory. The major assumption of this model is that we tend towards full employment of available resources. Freely fluctuating prices in the three major macro markets (goods, labour and money) ensure this. Classical economists focus on long term solutions for economic problems. This model was popular before the Great Depression. John Maynard Keynes developed this theory after the classical model failed to explain the Great Depression. Keynesian economists believe that free market economies are unstable. They rely on government intervention to make the economy work efficiently. Demand becomes a much bigger driving force and supply will adjust to demand, in a way "Demand creates its own supply". According to Keynes, wages and prices are rigid. This model gives no reason to believe in full employment and lays stress on immediate solution to economic problems.

2.2. Aggregate Demand and Aggregate Supply

An economy is in equilibrium when the quantity of goods produced in the economy is equal to demand for these goods. In other words, in output-price or output-inflation space when aggregate demand (AD) curve intersects Aggregate Supply (AS) curve, we get equilibrium level of output produced, or equilibrium level of income and spending, and the equilibrium price level. In the previous two modules, we studied the concept of aggregate demand. In this module, we explain the concept of AS curve.

2.3. Definition of Aggregate Supply Curve

With the objective of profit maximization, the amount of output that the firms are willing to supply at the given price level in the economy constitute aggregate supply. “The aggregate supply curve describes, for each given price level, the quantity of output firms is willing to supply.” (Dornbusch and Fischer (1994), pp-200). The amount of output that the firms are willing to supply depends on two things: (i) prices that they receive for their output, and (ii) the cost of factors of production. The cost of factors of production depends on the (i) level of inputs available, and (ii) level of technology. Thus, aggregate supply in turn reflects the condition that prevail in the factors markets. Assuming that there are two main factors of production, labour (L) and capital (K), aggregate supply curve will reflect the equilibrium in the labour market and capital market. Labour is supplied by the households at the going wage rate in the economy. Labour supply is affected by the population growth in the economy. Capital is supplied by the firms. An increase in investment by firms in machineries, building, equipment, and materials increases the supply of capital stock in the economy. Thus, cost of labour input is the wage rate, while the cost of capital inputs is the interest rates, the return to investment, v/s savings.

Construction of aggregate supply curve is different from the construction of the simple supply curve of a firm that is studied in microeconomics. At an individual firm level, an increase in price level is not associated with the increase in the cost of factors of production. Hence, the firms are willing to supply more at higher prices, leading to upward sloping supply curve. At the aggregate level, an increase in price means an increase in the general price level in the economy, which also increases the price of factors of production. As a result, the cost of production to the firm also increases. In such a situation, firms may not find it worth their while to increase their production. Thus, aggregate supply may not increase with increase in the price level. There is uncertainty on what will be the shape of the aggregate supply curve. the two main solutions that are provided for this uncertainty in the construction of aggregate supply come from the classical school of thought and from the Keynesian school of thought, respectively. The

shape of aggregate supply curve and its slope differ in terms of which school of thought we are studying. In the next section, we will study the aggregate supply curve in these two schools.

2.4. Aggregate Supply Curve in Classical Approach and in Keynesian Approach

Classical economists assumed that the aggregate supply curve is vertical, indicating that at the economy wide level, the same amount of goods is supplied, irrespective of the price level. Keynesian economists, on the other hand assumed that the aggregate supply curve is horizontal, indicating that the firms are willing to supply whatever amount of goods at the existing price level. Thus, classical and Keynesian views are completely opposite to each other in terms of aggregate supply. (see Figure 2.1).

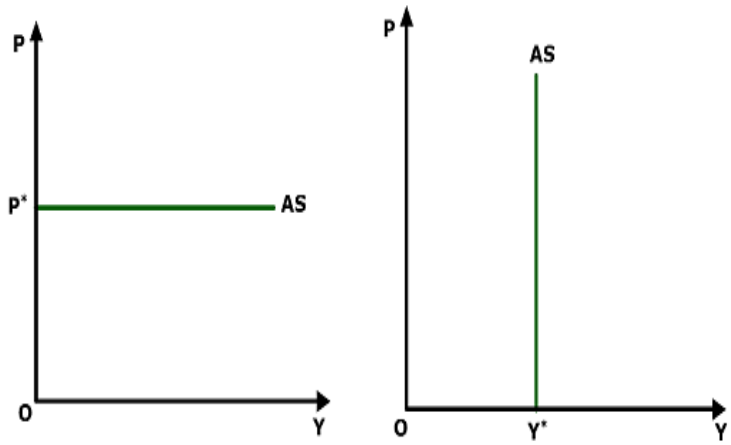

Figure 2.1: Panel (A) shows AS curve in Keynesian Case. Panel (B) shows AS curve in Classical Case.

The two AS curves are completely opposite to each other. To understand why the aggregate supply curve is different in classical and Keynesian approaches, we need to understand the time framework within which these AS curves are constructed. Basically, there are two time periods, giving rise to two aggregate supply curves:

(i) short-run analysis, giving rise to Short-Run Aggregate Supply Curve (SRAS), and

(ii) long-run analysis, giving rise to Long-Run Aggregate Supply Curve (LRAS).

A. Short-run Aggregate supply curve (SRAS) or the Keynesian Aggregate Supply Curve:

JM Keynes held the view that in the short-run, economy is operating below the full employment level. In other words, in the short-run, factors of production (especially labour) are not employed to their full capacity and there is unemployment. Thus, when the price level change, say it rises (due to rise in aggregate demand), firms can increase their production and hence supply, by hiring this unemployed labour force, without raising the wage rates. Thus, firms can get more labour at the current wages, and can increase its production with the same average cost of production. When the average cost of production does not change with the level of output, firms are willing to supply as much output as is demanded in the economy, at the given price level. Thus, aggregate supply curve is horizontal, as shown in Panel A of figure 2.1.

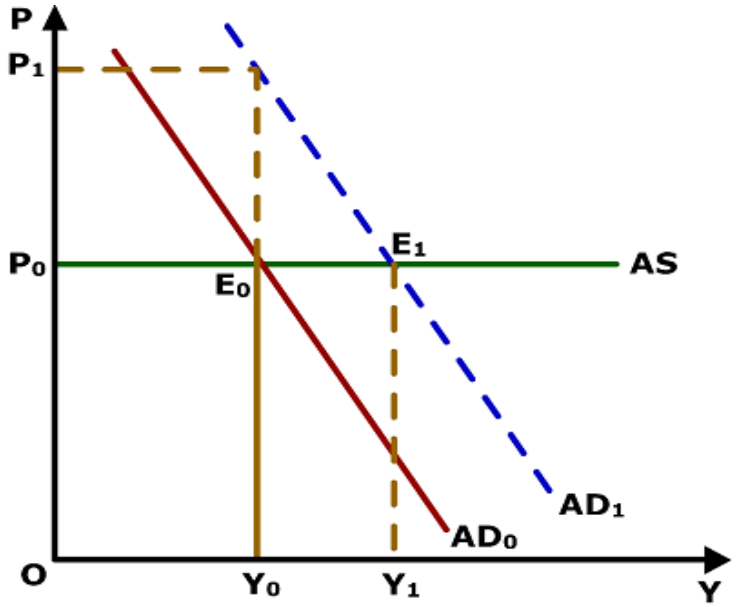

Figure 2.2: Equilibrium in short-run. Output is demand determined when AS curve is horizontal

The slope of AS curve approaches infinity, that is, output is highly responsive to the change in the price level. In a nutshell, in the short-run, due to under-employment and wage price rigidity, output will be determined by the aggregate demand. In figure 2.2 above, AS curve is horizontal, and AD is as usual downward sloping. Equilibrium is at point E0, equilibrium price level is P0 and output is Y0. If aggregate demand increases to AD1, price level has to

go up to P1. But due to wage-price rigidity, firms will hire more labour at the going wage rate, and produce and supply more output. New equilibrium will be attained at point E1, where output has increased to Y1, without any change in the price level. Thus, price level is fixed, and output is determined by AD curve.

(B) Long-run Aggregate Supply Curve (LRAS) or the Classical Aggregate Supply Curve:

Extremely opposite to Keynes view, Classical economists held the view that economy always operates at full-employment level, and any deviations from this level will be adjusted through immediate changes in the price level and the wage rates. Thus, if there are any changes in the price level, say a rise in the price level (due to increase in demand), firms cannot increase their production. In the labour market, there is no extra labour to be employed to produce extra output to meet the increased demand. Thus, nominal wages will rise in proportion to the price level, bringing the real wages back to their original level (which prevailed before the change in price level). Thus, real variables, real wages, and output will remain at their original levels, only nominal variables, nominal wages and price level will rise. Due to this dichotomy between real and nominal variables, aggregate supply curve, under classical approach is vertical, indicating the same amount of goods supplied at any price level (as shown in Panel B, figure 2.1).

The slope of AS curve is zero that is output supplied in unresponsive to any changes in the price level. In a nutshell, in the long-run, due to full employment and wage –price flexibility, output will be determined by the aggregate supply. In figure 2.3 below, AS curve is vertical, and AD is as usual downward sloping. Equilibrium is at point E0, equilibrium price level is P0 and output is Y*. If aggregate demand increases to AD1, price level goes up to P1, without any change in the output level. Output cannot be increased beyond Y*. New equilibrium will be attained at point E1, where price has increased to P1, without any change in the output level. Thus, output is fixed by AS curve and price level is determined by the AD curve.

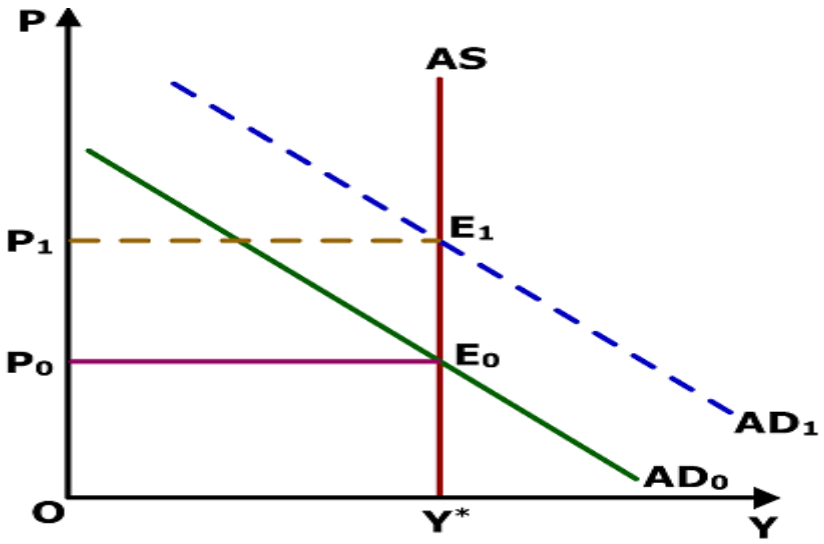

Figure 2.3: Equilibrium in long-run. Price level is demand determined when AS curve is vertical

(c) Intermediate case:

Medium-run Aggregate Supply Curve (MRAS) Due to the differences in the two opposing explanations of the shape of aggregate supply curve, economists have come up with an intermediate case between these extreme cases. This is generally referred as the medium run case, where the economy is operating below full-employment, but close to full-employment level of output. The aggregate supply curve is upward sloping, representing positive relationship between price level and output. It is neither horizontal nor vertical. This situation arises due to wage-price stickiness, rather than rigidity or flexibility. Due to a change in the price level (due to a change in demand), wages and prices will adjust slowly to their new equilibrium levels. This is because of three reasons: sticky wages theory, sticky prices theory, and misperception theory.

(i). Sticky Wage Theory:

Suppose, demand increases, which results in a rise in the price level at the current output level. It is difficult for the firms to increase its supply by increasing its use of factors of production in the short-run. Generally, firms operate with some fixed factors of production (usually capital) whose quantity is difficult to change in the short-run. Even for the variable factors of production (like labour), it is not possible for the firms to increase their labour

use, or to pay higher wages to their labour. For instance, if workers are hired on multi-year labour contracts with the firms, it is difficult for the firms to change the contract or to cancel the contract before the maturity period, and hence firms cannot increase the wages. Wages are sticky. In the medium run, some of the contracts attain their maturity and are subject to change, while workers also demand higher nominal wages in response to their lower real wages. As a result, wages start adjusting to the change in the price level. But this happens only slowly, over a period of time.

(ii) Sticky Price Theory:

When the price level increases, it is difficult for the firms to change the prices it charges, in response to the change in the general price level. For instance, consider a firm which prints its price catalogue. When price level gets changed, it is costly for the firm to change the price catalogues. If the cost of changing the prices charged in response to a change in general price level (called the menu costs) is more than the cost of raising the production and hence supply of goods, firms would prefer to continue to operate with the old prices, rather than with the new changed price level. Thus, prices are sticky. It will only be after a period of time, when the firms realize that it should charge a higher price in response to rise in the general price level, prices will start adjusting.

(iii) Misperception Theory:

In the labour market, when nominal wages go up, in response to a rise in the price level, workers have a misperception that it is a rise in their real wages. As a result, they supply more labour, leading to higher level of employment at output. They continue to do so until they realize that the rise in wages is merely a rise in nominal wages in response to higher price level, and not a rise in real wages. Thus, output will rise and wages will adjust slowly to the changes in the price level. Due to this sluggish adjustment of wages and prices, output will rise slowly, leading to upward sloping aggregate supply curve. Figure 2.4 below shows this medium run aggregate supply curve (MRAS). Output and price level is determined by the intersection of aggregate demand and supply curves (see figure 2.5 below).

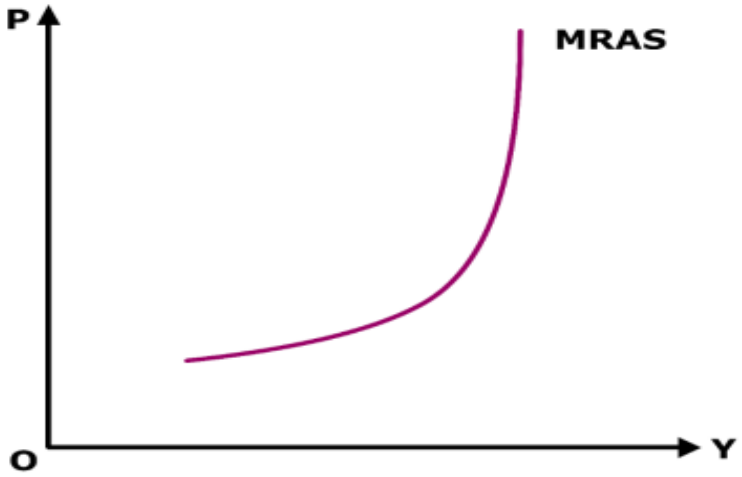

Fig.2.4. Medium Run Aggregate Supply Curve

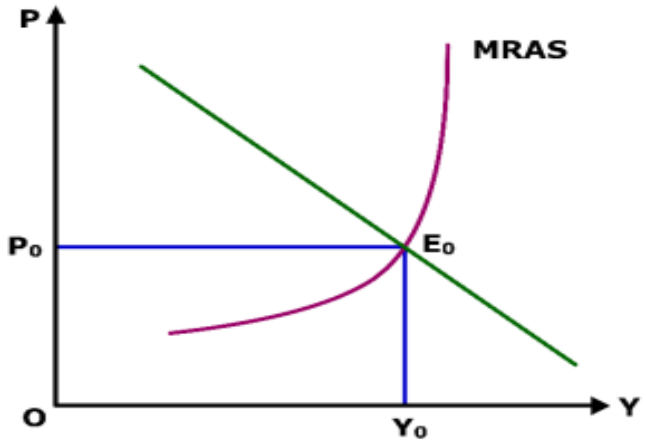

Fig.2.5. Equilibrium in medium run is attained at the intersection point of AD and AS curves

2.5. Classical Theory of Employment:

The term classical refers to virtually all the economists who had written on macroeconomic questions before 1936. To classical economists, the equilibrium level of income at any time was a point of full employment or a point when actual output was equal to potential output. Two features of the classical analysis are:

1. Classical economics stressed the role of real as opposed to monetary factors in determining real variables such as output and employment, Money has a role in economy only as a means of exchange.

2. Classical economics stressed the self-adjusting tendencies of the economy. Government policies to ensure an adequate demand for output were considered by classical economists to be unnecessary and generally harmful.

The determination of output and employment in the classical theory occurs in labour, goods and money markets in the economy. The classical theory assumes over the long period the existence of full employment without inflation. Given wage-price flexibility, there are automatic competitive forces in the economic system that tend to maintain full employment, and make the economy produce output at that level in the long run. Thus, full employment is regarded as a normal situation and any deviation from this level is something abnormal since competition automatically pushes the economy toward full employment.

The classical theory of income, output and employment is based on the following assumptions:

1. There is a normal situation of full employment without inflation.
2. There is a laissez faire capitalist economy without foreign trade.
3. There is perfect competition in labour, money and product markets.
4. Labour is homogeneous.
5. Total output of the economy is divided between consumption and investment expenditures.
6. The quantity of money is given. Money is only a medium of exchange.
7. Wages and prices are flexible.
8. Money wages and real wages are directly related and this relationship is proportional.
9. Capital stock and technological knowledge are given in the short run.

Now we study the three pillars of classical theory.

2.5.1. Determination of Output and Employment

In the classical theory, output and employment are determined by the production function and the demand for labour and the supply of labour in the economy. The production function is the relationship between the level of output and the level of factor inputs assuming a given technology. This can be written as: Q= F (K, N) Where the total output (Q) is the function (F) of stock of capital (K) and the quantity of the homogeneous labour input (N). For the short run, the capital stock is fixed, thus, output varies with labour only. Output is an increasing function of labour, output increases as the quantity of labour increases. But after a point when more workers are employed,

diminishing marginal returns to labour start. This is shown in Fig. 1 where the curve Q = F (N) is the production function and the total output OQ1 corresponds to the full employment level NF. But when more workers NfN2 are employed beyond the full employment level of output OQ1, the increase in output Q1Q2 is less than the increase in employment N1N2.

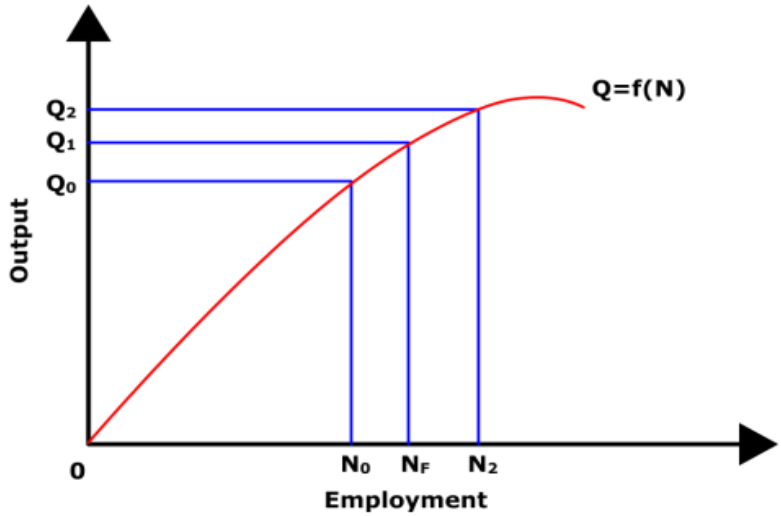

Fig.2.6.

2.5.2. Wage Price Flexibility

The classical economists believed that there was always full employment in the economy. In case of unemployment, a general cut in money wages would take the economy to the full employment level. This argument is based on the assumption that there is a direct and proportional relation between money wages and real wages. When money wages (W) reduce, this lead to reduction in the cost of production and thus, prices of product will also decrease. When prices fall, demand for product increases and sales will automatically increase. Increased sales will require more production and employment of more labour. Therefore, full employment will be attained again.

The demand for labour is a decreasing function of the real wage rate. If W is the money wage rate, P is the price of the product, and MPN is the marginal product of labour, we have W=P X MPN or W/P = MPN. Since MPN declines as employment increases, it follows that the level of employment increases as the real wage (W/P) declines. This is explained in Figure. Panel (A) shows the labour market equilibrium at point E which is the full employment level NF and the real wage W/P0. If the real wage rises to W/P1, supply exceeds the

demand for labour by sd and N1N2 workers are unemployed. It is only when the wage is reduced to W/P0 that unemployment disappears and the level of full employment is attained.

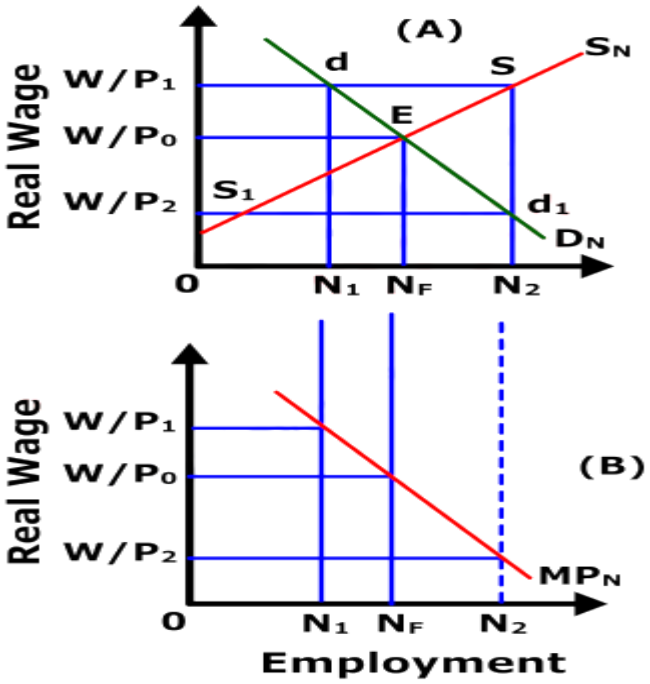

Fig.2.7.

This is shown in Panel (B), where MPN is the marginal product of labour curve which slopes downward as more labour is employed. Since every worker is paid wages equal to his marginal product, therefore the full employment level NF is reached when the wage rate falls from W/P1 to W/P0. Contrariwise, with the fall in the wage from W/P0 to W/P2, the demand for labour increases more than its supply by s1d1, the workers demand higher wage. This leads to the rise in the wage from W/P2 to W/P0 and the full employment level NF is attained.

2.6. Say's Law of Market

Say's law of markets is the core of the classical theory of employment. An early 19th century French Economist, J.B. Say, enunciated the proposition that "supply creates its own demand." Therefore, there cannot be general overproduction and the problem of unemployment in the economy.

On the other hand, if there is general overproduction in the economy, then some labourers may be asked to leave their jobs. There may be the problem of unemployment in the economy for some time. In the long-run, the economy will automatically tend toward full employment.

In Say's words, "It is production which creates markets for goods. A product is no sooner created than it, from that instant, affords a market for other products to the full extent of its own value. Nothing is more favourable to the demand of one product, than the supply of another." This definition explains the following important facts about the law.

Production Creates Market (Demand) for Goods:

When producers obtain the various inputs to be used in the production process, they generate the necessary income. For example, producers give wages to labourers for producing goods. The labourers will purchase the goods from the market for their own use. This, in turn, causes the demand for goods produced. In this way, supply creates its own demand.

Barter System as its Basis:

In its original form, the law is applicable to a barter economy where goods are ultimately sold for goods. Therefore, whatever is produced is ultimately consumed in the economy. In other words, people produce goods for their own use to sustain their consumption levels. Say's law, in a very broad way, is, as Prof. Hansen has said, "a description of a free-exchange economy. So conceived, it illuminates the truth that the main source of demand is the flow of factor income generated from the process of production itself. Thus, the existence of money does not alter the basic law.

General Overproduction Impossible:

If the production process is continued under normal conditions, then there will be no difficulty for the producers to sell their products in the market. According to Say, work being unpleasant, no person will work to make a product unless he wants to exchange it for some other product which he desires. Therefore, the very act of supplying goods implies a demand for them. In such a situation, there cannot be general overproduction because supply of goods will not exceed demand as a whole. But a particular good may be over produced because the producer incorrectly estimates the quantity of the product which others want. But this is a temporary phenomenon, for the excess production of a particular product can be corrected in time by reducing its production. J.S. Mill supported Say's views regarding the impossibility of general overproduction and general unemployment. According to him, Say's

law of markets does not consider the possibility of general overproduction and also rejects the possibility of decrease in the demand of goods produced in the economy. By employing more factors of production, there is an increase in the level of employment and therefore profits are maximized.

Saving-Investment Equality:

Income accruing to the factor owners in the form of rent, wages and interest is not spent on consumption but some proportion out of it is saved which is automatically invested for further production. Therefore, investment in production is a saving which helps to create demand for goods in the market. Further, saving-investment equality is maintained to avoid general overproduction.

Rate of Interest as a Determinant Factor:

Say's law of markets regards the rate of interest as a determinant factor in maintaining the equality between saving and investment. If there is any divergence between the two, the equality is maintained through the mechanism of the rate of interest. If at any given time investment exceeds saving, the rate of interest will rise. To maintain the equality, saving will increase and investment will decline. This is due to the fact that saving is regarded as an increasing function of the interest rate, and investment as a decreasing function of the rate of interest. On the contrary, when saving is more than investment, the rate of interest falls, investment increases and saving declines till the two are equal at the new interest rate.

Labour Market:

Prof. Pigou formulated Say's law in terms of labour market. By giving minimum wages to labourers, according to Pigou, more labourers can be employed. In this way, there will be more demand for labour. As pointed out by Pigou, "with perfectly free competition…there will always be at work a strong tendency for wage rates to be so related to demand that everybody is employed."

Unemployment results from rigidity in the wage structure and interferences in the working of the free market economy. Direct interference comes in the form of minimum wage laws passed by the state. The trade unions may be demanding higher wages, more facilities and reduction in working hours. In

short, it is only under free competition that the tendency of the economic system is to provide automatically full employment in the labour market.

Propositions and Implications of the Law:

Say's propositions and its implications present the true picture of the market law. These are given below:

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 is reached. Under such a situation, the level of production will be maximum.

2. Proper Utilization of Resources:

If there is full employment in the economy, idle resources will be properly utilized which will further help to produce more and also 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 of 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 example, in capital market, the equality between saving and investment is maintained by the 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 is 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 goods which they help to produce. Whatever is saved is automatically invested for further production. In other words, saving is a social virtue.

Criticisms of Say's Law:

J.M. Keynes in his General Theory made a frontal attack on the classical postulates and Say's law of markets. He criticised Say's law of markets on the following grounds:

1. Supply does not create its Demand:

Say's law assumes that production creates market (demand) for goods. Therefore, supply creates its own demand. But this proposition is not applicable to modern economies 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 markets 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 markets. On the other hand, 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 because there is underemployment in capitalist economies. This is because 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.

7. Equality through Income:

Keynes does not agree with the classical view that the equality between saving and investment is brought about through the mechanism of interest rate. But in reality, it is changes in income rather than the rate of interest which bring the two to equality.

8. Wage-cut no Solution:

Pigou favoured the policy of wage-cut to solve the problem of unemployment. But Keynes opposed such a policy both from the theoretical and practical points of view. Theoretically, a wage-cut policy increases unemployment instead of removing it. Practically, workers are not prepared to accept a cut in money wage. Keynes, therefore, favoured a flexible monetary

policy to a flexible wage policy to raise the level of employment in the economy.

2.7. Summary:

AS and AD determine the equilibrium level of output and price. The shape of AS is important in this context.

- The AS typically slopes upwards indicating a positive relationship between price level and output. It is drawn for a given level of expected price. If the expected price level increases, the AS shifts upwards.
- Given sticky nominal wage, an increase in the price level causes real wage to fall, thereby increasing the demand for labour, which results in more production. Thus, establishing a direct relationship between P and Y.
- When all prices are flexible, the positive relationship between P and Y can be explained assuming that producers have a misperception about the price level and they confuse overall price changes as relative price changes.
- The AS has three distinct shapes signifying three ranges. Keynesian AS is flat at a fixed price level and output adjusts to changes in demand. The Classical AS is vertical at full employment output and prices adjust in response to changes in demand, and finally, the intermediate range when AS slopes upwards.
- The SRAS shows the positive relationship between inflation and output, holding expected rate of inflation constant. The LRAS shows the long run situation when output is at the natural rate and it is independent of the inflation rate.
- SRAS shifts when expected rate of inflation changes or when a supply shock hits the economy.
- LRAS shifts when supply side factors, such as technology, changes or resources expand.

Prices and wages must be flexible in the short run. Both suppliers and purchasers of labour must know the relevant trading prices. This condition requires that when selling and buying labour at given money wage (W), both workers and employers know the command over goods that will result from such a wage (W/P).

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UNIT-III

UNDER EMPLOYMENT: KEYNESIAN THEORY

3.1. Introduction

The great depression of the 1930s led to a deep effect on both economic and political thinking. The consequences of this event turned out evolved a general consensus that governments would do their best to prevent such disasters from happening again. But even beyond this extreme case, there is general agreement that a stable and predictable economic environment provided by government contributes substantially to social and economic welfare. In the short-run, households favor to have economic steadiness with steady employment and unwavering incomes, letting them maintain stable consumption over time. In the long-run, unnecessary economic fluctuations can reduce growth, for example by increasing the riskiness of investments. A highly volatile economic environment might also have a negative impact on the choice of education profiles and career paths. In short, by maintaining a stable macroeconomic environment, economic policy can thus contribute to economic growth and welfare. With evolution of faith in government to provide appropriate environment for growth and stability, there emerged a Keynesian school of thought. The theory of total spending in the economy (called aggregate demand) and its effects on output and inflation is called Keynesian economics. However, in the late 1960s the Keynesian view was majorly challenged by Monetarism. The debate between Keynesians and monetarists often focused on the effectiveness of policy instruments with monetarists arguing for the ineffectiveness of fiscal tools and Keynesians believing in the superiority of fiscal stabilization policy.

3.2. Keynes Critique of Classical Theory

Difference between Keynesian thought and others:

1. Keynesians believe that unemployment as both high on average and too variable. They think that times of recession or depression are economic disorders and not as effective market responses to unappealing occasions. This does not imply that Keynesians will resort to government spending, taxes and money supply every now and then in order to keep the economy at full employment. This method of fine-tuning will not work because as there is a

pause between the times that alteration in policy is required and the time government identifies this. then there is also a lag when the government identifies that an amendment in policy is required and when it takes action. The last lag occurs amongst the time that policy is changed and when changes affect the economy. This too can take many months yet many Keynesian economists still believe that modest goal of stabilization is coarse – tuning implying that an economist need not have complete quantitative knowledge of intervals to frame monetary policy when unemployment rate is very high.

2. Some Keynesians are more anxious about tackling unemployment than about inflation. They believe that the costs of low inflation are small. However, there are many anti-inflation Keynesians. Keynesians usually support more aggressive expansionists policies than non- Keynesians. Keynesians support aggressive government policies to stabilize the economy created on value judgment on the belief that macroeconomic fluctuations significantly reduce economic well-being and government is well-informed and clever enough to improve on free market.

3. New classical think that predicted variations in the money supply do not affect real output. They believe in the concept that markets, even the labor market, adjust speedily to eradicated efficiencies and surplus; also, that business cycles may turn out to be efficient. In the 1990s, the new classical schools also came to accept the view that prices are sticky and that the labor market does not adjust as quickly as they previously thought.

4. Many Keynesians are skeptical about the idea that people use all available information to form their expectations about economic policy. Keynesians follow stabilization policy taking into account that the prices a sticky under rational expectation models. But Rational expectations do not consider rigid prices, rational expectation models with sticky prices are thoroughly Keynesian by definition.

5. There exists a “natural rate” of unemployment in the long run. Before 1970, Keynesians thought that the long-run level of unemployment is determined by on government policy, and that the government could accomplish a short unemployment rate by accommodating a high but stable rate of inflation. In the later stages of 1960s, Milton Friedman, a monetarist, and Columbia’s

Edmund Phelps, a Keynesian, overruled the idea of long-run trade-off on theoretical proofs. They claimed that to keep unemployment below "natural rate" the only way the government could do this was with macroeconomic policies that would continuously drive inflation higher and higher. In the long run, they claimed, the unemployment rate could not be below the natural rate. Soon thereafter, Keynesians like Robert Gordon presented empirical evidence for Friedman's and Phelps's view. Since 1972 Keynesians have integrated the "natural rate" of unemployment into their thinking.

6. New classical theory emphasizes the capability of a market economy to heal recessions by lowering in wages and prices. In the mid-1970s the New classical economists accredited economic slumps to people's misunderstandings about what was happening to relative prices (such as real wages). Problems would rise, they claimed, if people did not know the current price level or inflation rate. But such misunderstandings should be brief and cannot be high in societies in which price indexes are printed monthly and monthly inflation rate is less than 1 percent. Therefore, economic downturns, by the early new classical view, should be mild and brief. Yet, during the 1980s most of the world's industrial economies endured deep and long recessions. Keynesian economics undoubtedly forecasts periods of tenacious involuntary unemployment though it may not be theoretically profound.

7. According to new classical theories of the 1970s and 1980s, a decrease in the growth of the money supply if perceived correctly should have only small effects on real output. Yet, when the Federal Reserve and the Bank of England proclaimed that monetary policy would be squeezed to cure inflation, and then implemented on their promises, acute recessions followed in each country. New Classicals might propagate that the contraction was unexpected because people did not follow what the monetary authorities said. The Archaic Keynesian theory says that any monetary constraint is contractionary because firms and individuals have fixed-price contracts and not inflation-adjusted contracts, which seems more reliable with certain events.

8. Harvard's Robert Barro originated the idea of debt neutrality Barro propagates that inflation, unemployment, real GNP, and real national saving should not be affected by whether the government finances its spending with

high taxes and low deficits or with low taxes and high deficits. Because individuals are rational, so they will correctly observe that low taxes and high deficits today must mean higher future taxes for them and their inheritors. They will cut consumption and increase their saving by one dollar for each dollar increase in future tax liabilities. Thus, an increase in private saving should counterbalance any increase in the government's deficit. Keynesian analysis, by contrast, sees a rise deficit, with government spending held constant, as an increase in aggregate demand. The massive U.S. tax cuts between 1981 and 1984, it was observed that private saving rate did not rise, real interest rates soared. With the fiscal offset by monetary contraction, real GNP growth was not affected; (Alan S. Blinder, 1987). Again, all this appears reliable with Keynesian than with new classical theory.

9. Finally, the European depression of the 1980s, the vilest since the depression of the 1930s. Governments, controlled by the British and German central banks, decided to fight inflation with restrictive monetary and fiscal policies conforming the Keynesian framework-. The anti-inflation campaign was supported by the European monetary system, which, in effect, spread the stern German monetary policy all over Europe. The new classical school has no comparable explanation. New Classical and traditional economists in general, propagate that European governments affect more deeply in labor markets with high unemployment benefits, for example -limits on firing workers. But at the same time these interferences were existing in the early 1970s, when unemployment was extremely low.

3.3. Involuntary Unemployment

we examine an important macroeconomic phenomenon, viz., unemployment. Unemployment is a problem which has wide economic, social and political ramifications. An unemployed person suffers from economic and psychological distress which can impair his well-being and social life. The loss to the economy due to the loss of output and the wastage of human resource is severe and manifold. It is not surprising then that political parties seek to resolve this problem and promise to generate jobs in their election manifestos. The Unemployed comprise all persons above a specified age who report that they are without work, that they are available for work and that they have

taken active steps to find work in the specified reference period as outlined by the ILO guidelines. These include registering at a private or public employment exchange, answering vacancy notices, visiting factories, construction sites and other places of work, seeking assistance of friends and relatives or looking for resources to set up own enterprise. In an economy, where unemployment is low, the workers are better off as they can negotiate a high wage for themselves. In other words, a tight labour market is favorable for the workers vis a vis the firms. However, when unemployment is high, workers are worse off as unemployed workers face a lower possibility of finding a job and employed workers have a higher probability of losing their jobs. Given the enormity of the problems associated with unemployment, it is important for the student of economics to learn the nature and causes of unemployment and its possible solutions. In this unit we learn about the theories of unemployment proposed by the Classical, Keynesian and the New Keynesian schools. Before venturing into the theories, a brief survey of the labour market would enable us to understand its underlying complexity.

How to measure?

Labour force (L) is the sum of those who are employed (E) and those who are unemployed (U);

L=E + U.

The labour force participation rate is the ratio of Labour force to the Population (in percentage);

LFPR = (L/Working age population) x100

The Work force participation rate is the ratio of employment to the labour force (in percentage);

WFPR = (E/L) x100 Unemployment Rate is the ratio of unemployed to the labour force (in percentage);

u = (U/L) x100

3.4 Theories of Unemployment

3.4.1 The Classical Theory of Unemployment: Full Wage-Price Flexibility

The classical approach assumes that markets are perfectly competitive; expectations are fully rational; wages and prices are completely flexible; forces of supply and demand determine the equilibrium, which is at full

employment. The labour market determines the demand and supply of labour where the participants are firms who demand labour in exchange for wages and workers who supply labour in exchange for wages. In this model, the equilibrium between the forces of labor demand and labor supply determines the real wage and employment. The real wage matters because the worker is concerned more about the purchasing power of the wage, he receives than its nominal value. Suppose the nominal wage W is Rs.10 and the price level P is 2. Then real wage W/P is 5. If nominal wage rises to Rs. 20 and Price level P is 4; then real wage remains the same and the worker is able to afford the same amount of goods and services as before. The firm's demand for labour is derived from the demand for the firm's output and therefore it is called a derived demand. If demand for firms output increases the firm would hire more labour The marginal product of labour (MPL) is the extra output produced by the firm by hiring one more unit of labour. Production functions exhibit diminishing marginal returns implying that by keeping capital constant if more labour is hired, the marginal product of labour diminishes. Under conditions of perfect competition, profit maximizing firms will hire workers till marginal revenue product (MPL X P) is equal to the cost of hiring an additional unit of labour (W) or till MPL becomes equal to the real wage. Thus, the marginal product curve of labour constitutes the firm's labour demand curve. Labor demand is inversely related to the real wage implying that as real wage falls the demand for labour by the firms would go up. The Labour supply curve is generally upward sloping and positively related to the real wage. The labour supply curve is derived from the tradeoff between work and leisure. Working more hours in a day would mean sacrificing leisure, but at the same time, there is an opportunity to earn more. If wages rise relative to prices, the real wage would rise and the worker would be keen to supply more labor.

Figure 3.1 shows the downward sloping labour demand curve intersecting the upward sloping labour supply curve at point E with (W/P) * as the real wage and N* as the equilibrium employment. Corresponding to N* we have the Full employment Output Y*. This does not however mean that unemployment is zero. Even though everybody who is looking for work is finding one; some

choose to be voluntarily unemployed. It is a frictionless market with full wage price flexibility and little scope for persistent unemployment. If for some reason real wage is more than the equilibrium real wage, wage price flexibility will ensure that equilibrium is maintained. Suppose (W/P)'>W/P*, there is an excess supply of labour (distance AB) at the new wage resting in unemployment at N'. This will put a pressure on W/P to fall, reducing the excess supply so that equilibrium is restored E at full employment.

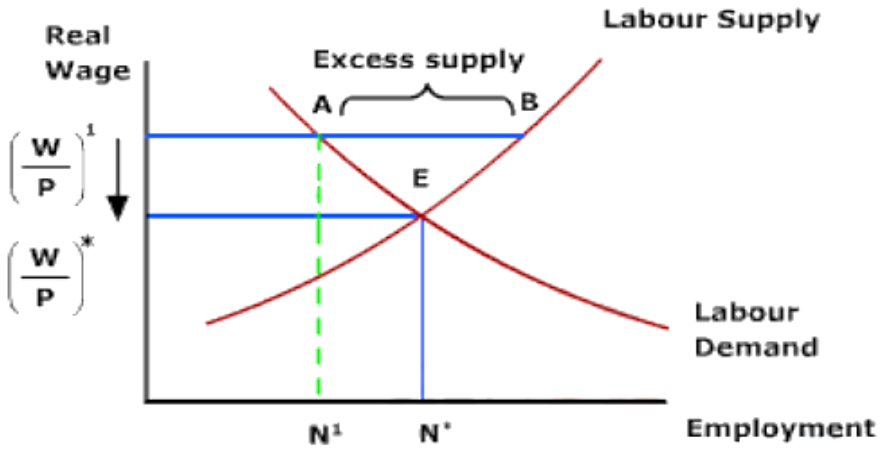

Fig.3.1. The Classical Model

Under the Classical assumption of fully flexible wages and prices, the smoothly functioning labou market ensures the economy is always at full employment Y*, and the aggregate supply is vertical at Y*. Now, full employment does not mean the unemployment rate is zero. The unemployment rate corresponding to labour market equilibrium (or full employment) is known as the 'natural rate of unemployment'. It is the rate of unemployment to which the economy gravitates in the long run When the economy is at equilibrium at full employment, any unemployment that arises is purely frictional in nature, implying that even in the best organized labor markets some amount of unemployment would arise because it takes time for workers to search for a new job, or transit from one job to the other or for firms to look for the right type of worker. As the worker is voluntarily searching for work it is also called search unemployment. Unemployment may also arise due to structural factors in a changing economy where new industries are expanding and old ones are shrinking. Workers losing jobs in the shrinking industries lack the necessary skills to be absorbed into new activities causing unemployment to rise. Thus, though the natural rate of

unemployment reflects full employment output, this unemployment is due to frictional and structural factors. Therefore, it is also referred as frictional or structural unemployment. The classical school is also skeptical of any government intervention in the free functioning of the market. Any government policy to set wages at a legal minimum creates distortion in the market as it artificially increases the real wage above the equilibrium wage rate. Figure 3.2 shows the effect of an increase in minimum wages (set above

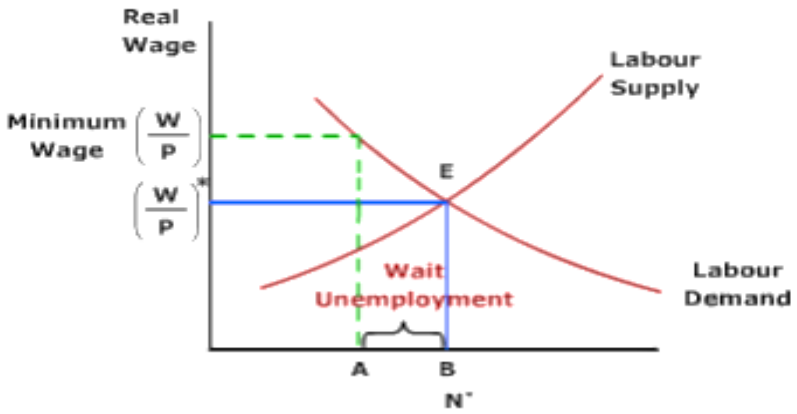

Fig.3.2.

the market clearing wage, which is considered to be too low). Minimum wage legislation causes unemployment, measured by the distance AB in Figure 4. This can also be called wait unemployment as people are simply waiting for jobs to be available.

3.4.2 The Keynesian View of Unemployment: Wage-Price Rigidity

The experience of the Great Depression led John Maynard Keynes to question the assumption of full wage price flexibility of the classical model. According to him wages are sticky downwards. In other words, high unemployment would not lead to fall in real wages as workers do not like a cut in their nominal wages and would resist any such move through strikes and demonstrations. Fearing workers resistance employers also are wary of cutting wages. Besides nominal wages are set by contracts which remain effective for many years and cannot be renegotiated in response to changing demand and supply conditions making it difficult for wages to adjust. Wages may eventually fall to reach the full employment equilibrium but only gradually. Keynes showed that involuntary unemployment can arise if there

is a lack of effective demand in the goods market. In such a situation firms start accumulating inventories and they cut back on production and hiring. This has a negative impact on labour demand, so that more people are willing to work than is desired by the market, resulting in unemployment. This calls for government intervention to boost aggregate demand so that more goods are produced by employing more labor. The following figure 3.3 makes it clear. Let Y* depict the full employment output. Suppose the economy is at point A where Y is less than Y*. Here unemployment arises due to lack of effective demand as depicted by a lower aggregate demand AD0. The government can take appropriate steps to increase aggregate demand by spending more, possibly in health and education so that AD shifts from AD0 to AD1 taking the economy to full employment output at Y* thereby resolving the problem of unemployment.

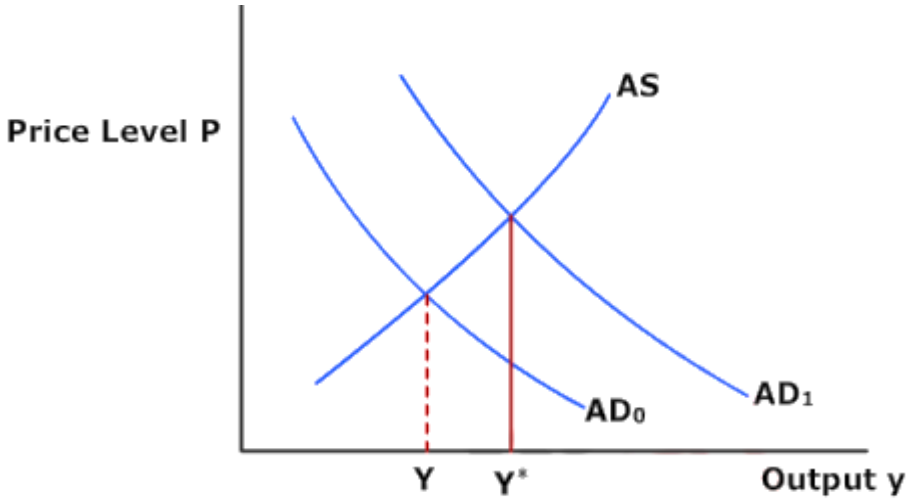

Fig.3.3. Unemployment due to lack of effective demand.

The unemployment at Y can also be called cyclical unemployment as the economy is in the recessionary phase of a business cycle. It can be cured by expansionary policies such as the one discussed above.

3.4.3 The New Keynesian View:

Economists with Keynesian orientation known as the New Keynesians have offered some explanations for sticky wages. Figure 3.4 below shows that real wages higher than the equilibrium wage causes unemployment (measured by the distance OB). It may be difficult to reduce such unemployment as typically wages are inflexible due to a number of reasons. These are explained below:

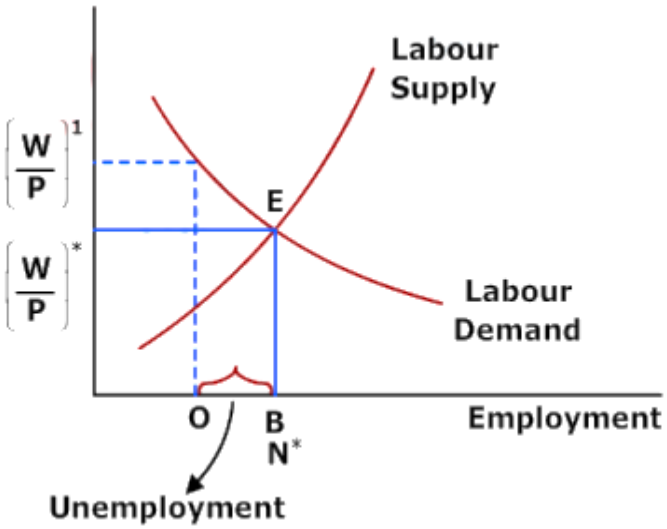

Fig.3.4.

Collective Bargaining: workers have strong bargaining power if they collectively form a trade union and negotiate a higher wage for themselves than the equilibrium wage rate. This makes some workers unemployed but rest of them can get a better wage. The fear of unionization also makes the firm pay a higher wage to prevent its workers from forming a union.

- **Theory of Efficiency Wages**: The firm pays a high real wage so that the worker is motivated to work more efficiently and generates more profits for the firm. It also reduces labor turnover as workers prefer to stay with the firm instead of looking for other jobs. This substantially reduces the firm's hiring and training costs which it would have had to incur if the worker had quit the firm. A higher-than-normal wage makes it costly for the worker to lose his job which ensures that the self supervises to work efficiently instead of shirking his work. This also reduces supervision cost.
- **Minimum Wage Laws**: Employers are required to pay legally binding minimum wages to certain category of workers who are often the less skilled or work in the informal sector.
- **Insider Outsider Model**: Insiders are those who work with the firms and outsiders are those who are unemployed. Insiders are always better placed to negotiate with the firms on matters of remuneration and job contracts. They may go to the extent of intimidating the outsiders in order to secure their jobs. The firms also favor the insiders and pay them a high wage even though outsiders are willing to work at a low wage. By doing so, firms avoid

expenditure on hiring and training new entrants or the outsiders.

The Short Run and the Long Run

The Classical theory depicts full employment whereas the Keynesian theory justifies the existence of a situation of less than full employment. It is natural to ask which of the two is more acceptable and realistic in describing an economy. One may answer this by understanding the figure (7) below. In the Keynesian model, factor and commodity prices are rigid and the AS (K) is horizontal at the given price level P0.

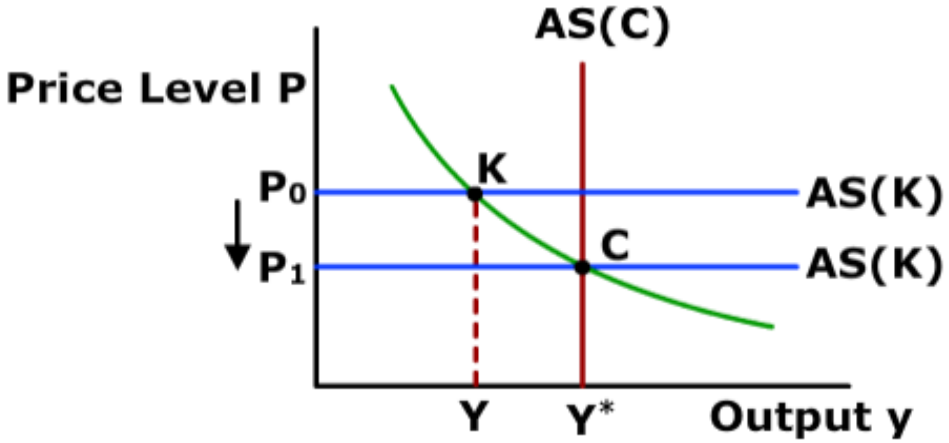

Fig.3.5.

In the Classical model factor and commodity prices are flexible and the AS (C) is vertical at the potential (full employment) level of output Y*. In the short run, when prices are inflexible the economy is at point K depicting the Keynesian equilibrium with output Y. The point also characterizes recession and unemployment which lowers wages and prices gradually making the AS (K) shift downwards (at price level P1) and the economy reach point C in the long run depicting the classical equilibrium.

Even though the Classical and the Keynesian views are on the opposite end of the spectrum, the contemporary analysis brings together a Classical-Keynesian Synthesis. The Keynesian view of wage price stickiness is realistic as it explains the existence of involuntary unemployment. It is better suited to depict the short run equilibrium, a time space when contracts cannot be negotiated. However, over a longer time frame when contracts can be reworked, the flexibility of wages and prices return and the economy approaches the long run depicting the full employment equilibrium of the Classical Model.

3.5. Effective Demand

Prior to Keynes no satisfactory explanation was given of the factors determining the level of employment in the economy. Economists mostly assumed the prevalence of the state of full employment believing in Say's law of Markets, an old proposition claiming that all income is automatically spent or that the level of Effective Demand is always enough to lift all goods and services produced off the market. There were many economists who challenged the assumptions and logic of the Say's Law. For example, T.R. Malthus tried hard to convince contemporaries the demand in general might fall short of supply in general and the deficiency of aggregate demand might cause general over production and hence general unemployment. But Malthus failed to explain how effective demand could be deficient or excessive. It was Keynes, who for the first time put forward a systematic and convincing theory of employment based on the 'Principle of Effective Demand". The idea behind this theory is not difficult to grasp.

3.5.1. Keynes's Principle of Effective Demand:

The principle of 'effective demand' is basic to Keynes' analysis of income, output and employment. Economic theory has been radically changed with the introduction of this principle. Stated briefly, the Principle of Effective Demand tells us that in the short period, an economy's aggregate income and employment are determined by the level of aggregate demand which is satisfied with aggregate supply. Total employment depends on total demand. As employment increases, income increases. A fundamental principle about the propensity to consume is that as the real income of the community increases, consumption will also increase but by less than income. Therefore, in order to have enough demand to sustain an increase in employment there must be an increase in real investment equal to the gap between income and consumption out of that income. In other words, employment can't increase, unless investment increases. We can generalize and say; a given level of income and employment cannot be maintained unless investment is sufficient to absorb the saving out of that level of income. This is the core of the principle of effective demand.

3.5.2. Meaning of Effective Demand:

Effective demand manifests itself in the spending of income. It is judged from the total expenditure in the economy. The total demand in the economy consists of consumption goods and investment goods, though consumption goods demand forms a major part of the total demand. Consumption goes on increasing with increase in income and employment. At various levels of income there are corresponding levels of demand but all levels of demand are not effective. Only that level of demand is effective which is fully met with the forthcoming supply so that entrepreneurs neither have a tendency to reduce nor to expand production. Effective Demand is the demand for the output as a whole; in other words, out of the various levels of demand, the one which is brought in equilibrium with supply in the economy is called effective demand. It was this theory of effective demand which remained neglected for more than 100 years and came into prominence with the appearance of Keynes' General Theory.

Keynes was interested in the problem of how much people intended to spend at different levels of income and employment, as it was this intended spending that determined the level of consumption and investment. Keynes's view was that people's intentions to spend were translated into aggregate demand. Should aggregate demand, said Keynes, fall below income businessmen expect to receive, there will be cut backs on production of goods resulting in unemployment. On the opposite, should aggregate demand exceed expectations, production will be stimulated.

In any community, effective demand represents the money actually spent by-people on goods and services. The money which the entrepreneurs receive is paid to the factors of production in the form of wages, rent, interest and profit. As such, effective demand (actual expenditure) equals national income which is the sum of the income receipts of all members of the community.

It also represents the value of the output of the community because the total value of the national output is just the same thing as the receipts of the entrepreneurs from selling goods. Further, all output is either consumption goods or investment goods; we can therefore say that effective demand is equal to national expenditure on consumption plus investment goods.

Thus, effective demand (ED) = national income (Y) = value of national output = Expenditure on consumption goods (C) + expenditure on investment goods (I).

Therefore, ED = Y = C + I= 0 = Employment.

3.5.3. Importance of Effective Demand:

The principle of effective demand occupies an integral position in the Keynesian theory of employment. The general theory has the basic observation that total demand determines total employment. A deficiency of effective demand causes unemployment. The Principle of Effective Demand has its importance on the following counts.

In the first place, it can be said that it is with the help of the concept of effective demand that Say's Law of Markets has been repudiated. The concept of effective demand has established beyond doubt that whatever is produced is not automatically consumed nor is the income spent at a rate which will keep the factors of production fully employed.

Secondly, an analysis of effective demand also shows the inherent contradictions in Pigou's plea that wage cuts will remove unemployment. In Keynes' view, as level of employment depends upon the level of effective demand, wage cuts may or may not increase employment.

Thirdly, the Principle of Effective Demand could explain as to how and why a depression could come to stay. Keynes explained that Effective demand consists of consumption and investment. As employment increases, income also increases leading to a rise in consumption but by less than the rise in income. Thus, consumption lags behind and becomes the chief reason of the gap that comes to exist between total income and total expenditure therefore, in order to maintain effective demand at earlier (or original) level, real investment, equal to the gap between income and consumption, must be made. In other words, employment cannot expand unless investment expands. Therein has the all most importance of the principle of effective demand. It makes clear that investment rules the roost.

Fourthly, it puts the spotlight on the demand side. In contrast to the classical emphasis on the supply side, Keynes placed major emphasis on demand side and traced fluctuations in employment to changes in demand. The theory of

effective demand makes clear how and why aggregate demand becomes deficient in a capitalist economy and how deficiency of effective demand generates depression.

3.5.4. Determinants of Effective Demand:

For an understanding of Keynes' theory of employment and how an equilibrium level of employment is established in the economy, we must know its determinants the aggregate demand function and the aggregate supply function and their inter-relationship.

1. Aggregate Demand Function, and
2. Aggregate Supply Function.

1. Aggregate Demand Function:

Aggregate Demand Function relates any given level of employment to the expected proceeds from the sale of production out of that volume of employment. What the expected sale proceeds will be depends upon the expected expenditures of the people on consumption and investment. Every producer in a free enterprise economy tries to estimate the demand for his product and calculate in anticipation the profit likely to be earned out of his sale proceeds.

The sum-total of income payments made to the factors of production in the process of production constitutes his factor costs. Thus, the factor costs and the entrepreneur's profit added to them give us the total income or proceeds resulting from a given amount of employment in a firm. Keynes carried this idea into macro-economics. We can calculate the aggregate income or total sale proceeds. This aggregate income or aggregate proceeds expected from a given amount of employment is called the "Aggregate Demand Price" of the output of that amount of employment, i.e., it represents expected receipts when a given volume of employment is offered to workers. Entrepreneurs make decisions about the amount of employment they will offer to labour on the basis of the expectations of sales and expected profit which, in turn, depend upon the estimate of the total money (income) they will receive by the sale of goods produced at varying levels of employment. The sale proceeds which they expect to receive are the same as they expect the community to spend on their production.

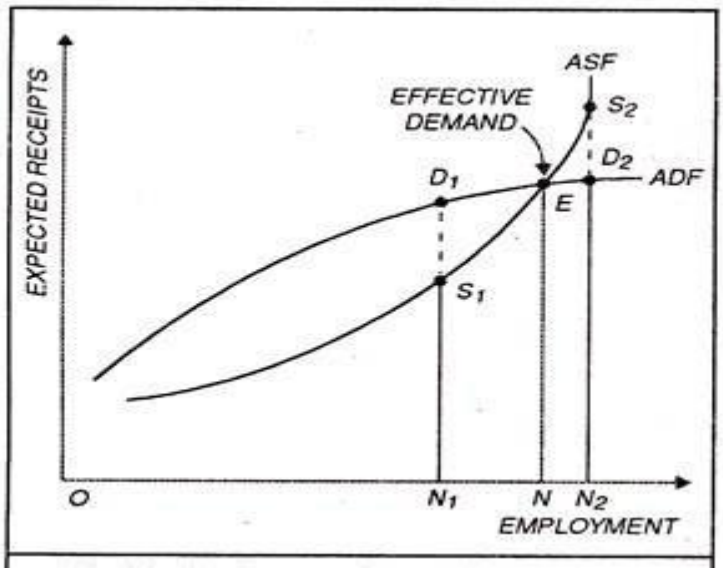

Fig.3.6. Aggregate Demand Function

A schedule of the proceeds expected from the sale of outputs resulting from varying amounts of employment is called the aggregate demand schedule or the aggregate demand Junction. The aggregate demand function shows the increase in the aggregate demand price as the amount of employment and hence output increases. Thus, the aggregate demand schedule is an increasing function of the amount of employment.

The question may reasonably be asked: why did Keynes relate expected sale proceeds with employment through output and why not with output directly? Three possible reasons may be given for this:

(i) Keynes was mainly interested in the factors that go to determine employment rather than output;

(ii) To all intents and purposes employment and output move in the same direction in the short period;

(iii) The total production in the economy consists of a large variety of goods and there is no better measure of it than the labour employed.

Therefore, if D represents the proceeds expected by entrepreneurs from the employment of N men, the aggregate demand function can be written as D= f (N), which shows a relationship between D and N. The aggregate demand function or demand schedule ADF is shown in the figure 3.6.

We find in the figure that the A Dadoes not start from the origin O because even at low levels of employment consumption will be much above income. As

we move along the ADF curve to the right, we find that it is becoming flatter owing to the psychological law of consumption. But the ADF can never slope downwards simply because the absolute amount of consumption in the economy can never go down.

2. Aggregate Supply Function:

Aggregate supply is related to production done by firms. While providing employment to workers, entrepreneurs must feel assured that the output produced by them would be sold out and they will be able to recover their costs of production and get the expected profit margin also. A firm's output can sell at different prices depending on market conditions. But there are some proceeds of the output for which the entrepreneurs think it will just make worthwhile to provide a certain amount of employment.

The minimum expected sale proceeds of the output resulting from a given amount of employment are called the 'Aggregate Supply Price' of that output. In other words, these are the minimum expected proceeds which are considered just necessary to induce entrepreneurs to provide a certain amount of employment. For the economy as a whole at any given level of employment of labour, aggregate supply price is the total amount of (sale proceeds) which all the producers, taken together, must expect to receive from the sale of the output produced by that given number of men, if it is to be just worth employing them.

A schedule of the minimum amounts of proceeds required to induce entrepreneurs to give varying amounts of employment is called the aggregate-supply schedule. This is also an increasing function of the amount of employment. In other words, the minimum sale proceeds necessary go on rising as employment and output are raised. This is due to the rise in cost of production with increasing output, given the capital stock, the techniques of production and organization in the short run. It is pertinent to observe here that in the aggregate demand function it is the expected sale proceeds that we consider and in the aggregate supply function it is the minimum sale proceeds necessary. There will be difference between them because at certain levels of employment (outputs), producers will expect more proceeds than the minimum sale proceeds necessary. There will be other levels of employment

where the sale proceeds expected may be less than the sale proceeds necessary. The Aggregate Supply Function ASF is shown in Figure as rising from left upwards to the right gradually at first and then quickly. The ASF becomes vertical after the point S_2 because at this level of aggregate supply all those who want to be employed get employment. This point indicates full employment in the economy.

3.5.5. Determination of the Level of Employment:

ADF is the Aggregate Demand Function and ASF the Aggregate Supply Function. We show employment along X-axis and sale proceeds along Y-axis. The point E where the ADF curve is cut by the aggregate supply curve is called the point of effective demand. It may be noted that there are so many points on the aggregate demand curve ADF, but all these points are not effective except point E. In the diagram, aggregate supply function shows the minimum proceeds which are just necessary to induce entrepreneurs to provide varying amounts of employment; the aggregate demand function shows the proceeds expected from the sale of outputs resulting from various amounts of employment.

Before these curves intersect each other at E, ASF lies below the ADF so that at the one level of employment the expected sale proceeds N_1D_1 are greater than the minimum sale proceeds necessary N_1S_1 showing that the employers will be induced to provide increased amount of employment. At point E, ADF is intersected by ASF' and entrepreneurs' expectations of proceeds are realised. The point E is called the point of equilibrium as it determines the actual level of employment (ON) at a particular time in an economy. The level of employment ON_2 is not an equilibrium level because the sale proceeds expected N_2D_2 are less than the sale proceeds necessary N_2S_2 at this level of employment. Most of the entrepreneurs will be disappointed and will reduce employment. Thus, we see that:

The intersection of the aggregate demand schedule with the aggregate supply schedule determines the actual level of employment m an economy and that at this level of employment, the amount of sale proceeds which the entrepreneurs expect to receive is equal to what they must receive if their 'costs' at that level of employment are to be just covered.

3.5.6. Underemployment Equilibrium:

It may, however, be noted that the economy is no doubt, in equilibrium at the point E, for here the entrepreneurs do not have the tendency either to increase or decrease employment. But Keynes makes a singular contribution to economic analysis by saying that E may or may not be a point of full employment equilibrium. If it is so very good. If, however, some workers still remain unemployed when ADF and ASF are equalised, in that ease, it will be known as Underemployment Equilibrium. Keynes argued like this. Aggregate demand and aggregate supply might be equal at full employment; this will be so if investment happens to equal the gap between the aggregate supply price corresponding to full employment and the amount which consumers choose to spend on consumption out of full employment income.

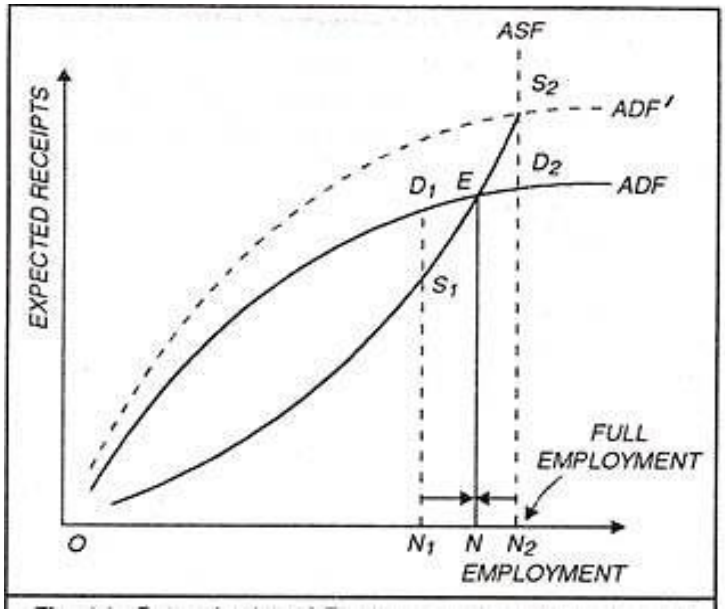

Fig.3.7. Determination of Employment through the principle of Effective Demand

Keynes believed that private investment in a capitalist economy is never sufficient to fill such a gap. As such, there is every likelihood that aggregate demand function and aggregate supply function may intersect at a point of less than full employment-called Underemployment Equilibrium. If underemployment equilibrium is the common situation in the capitalist economy, then how can we achieve full employment Keynes suggested that in the short period government can raise aggregate demand in the economy through public investment which is not profit-motivated. Refer to figure 3.7.

Suppose the government makes an investment equal to D_2S_2 and this raises the ADF to the level ADF' and the demand function cuts the supply function at S_2. The vertical line from the point S_2 down on the horizontal axis shows that this policy of public investment would achieve the full employment ON_2 in the economy.

Shapes of the ASF and ADF:

It is very difficult to comment upon the shapes of Aggregate Demand Schedule and Aggregate Supply Schedule. Presuming, however, that the money prices of all goods are constant and employment and output rise and fall in proportion to each other, we can safely come to the conclusion that both the aggregate demand function and the aggregate supply function are increasing functions of employment; then rise from left upwards to the right. The ADF rises at first rather steeply and then goes flatter and flatter. This is because of (nature of the consumption function) MFC being less than one. The ISF rises slowly at first because of the available unemployed resources. As bottlenecks in production are faced, diminishing returns (increasing costs) become more prominent. Beyond the point of full employment, production cannot be increased at all. So, the ASF which was rising steeply becomes vertical beyond the full employment point (S_2).

Relative Importance of ASF and ADF Functions:

Since the equilibrium level of employment is determined by the intersection of these two schedules, it would be useful to know some more details about the nature and character of these schedules. Of the two, there is little that is important about Aggregate Supply Function. Keynes gives scant attention to the aggregate supply function and concentrates more on aggregate demand function. For all practical purposes, he takes ASF as given because he deals with the short period and in the short period, supply conditions cannot be changed.

Moreover, in the General Theory, Keynes was concerned with an economy facing unemployment of resources during depression. Under such circumstances, there is little to gain from manipulating the technical conditions of production like costs, machines, and materials through schemes like rationalisation. Rationalisation results in more unemployment in the

short period. It was because of these reasons that Keynes took ASF as given. Since the supply conditions had to be taken as given. Keynes gave more importance to the aggregate demand function. Given the aggregate supply schedule, the resources in an economy would be fully utilised only if there is enough aggregate demand It is because of this that some economists call his theory of employment a 'theory of aggregate effective demand'. Aggregate demand depends upon consumption and investment. If employment is to be expanded, expenditure on consumption and investment should be stepped up. Thus, the shape and position of the aggregate demand function depend upon the total expenditure incurred by a community on consumption and investment taken together. Assuming, as Keynes docs, the aggregate supply function to be given, the pith and substance of his argument in the General Theory is that employment is determined by aggregate demand, which in turn, depends on the propensity to consume and the amount of investment at a given time.

3.6. Keynesian Liquidity Preference Theory of Interest:

Keynes states the rate of interest as the reward for parting with liquidity for a specific period of time. According to him, the rate of interest is found by the demand for and supply of money. Demand for money Liquidity preference means the wish of the public to hold cash. As per Keynes, there are mainly 3 motives behind the desire of the public to hold liquid cash:

(1) the transaction motive,
(2) the precautionary motive, and
(3) the speculative motive.

Transactions Motive:

The transactions motive is related to the demand for money or the need of cash for the current transactions of individual & business exchanges. Individuals hold cash in order to reduce the gap between the receipt of income & its expenditure. This is known as the income motive. The businessmen also require to hold ready cash in order to meet their current needs such as payments for raw materials, transport, wages etc. This is known as the business motive.

Precautionary motive:

Precautionary motive for holding money refers to the desire to hold cash balances for unexpected contingencies. Individuals hold some cash to offer for illness, accidents, unemployment & other unexpected contingencies. Similarly, businessmen keep cash in reserve to tide over unfavorable circumstances or to gain from unexpected deals Keynes holds that the transaction & precautionary motives are comparatively interest inelastic, but are highly income elastic. The amount of money held under these two motives (M1) is a function (L1) of the level of income (Y) and is expressed as

M1 = L1 (Y)

Speculative Motive:

The speculative motive relates to the desire to hold one's resources in liquid form to take benefit of future changes in the rate of interest or bond prices. Bond prices & the rate of interest are inversely related to each other. If bond prices are likely to rise, i.e., the rate of interest is expected to fall, people will purchase bonds to sell when the price later really rises. Though, if the bond prices are expected to fall, i.e., the rate of interest is likely to rise, people will sell bonds to evade losses. According to Keynes, the higher the rate of interest, the lower the speculative demand for money, and lower the rate of interest, the higher the speculative demand for money. Algebraically, Keynes gave the speculative demand for money as

M2 = L2 (r) Where, L2 is the speculative demand for money, and r is the rate of interest.

Geometrically, it is a smooth curve that slopes downward from left to right. Now, if the total liquid money is given by M, the transactions plus precautionary motives by M1 and the speculative motive by M2, then

M = M1 + M2.

Since M1 = L1 (Y) and M2 = L2 (r), the total liquidity preference function is given as M = L (Y, r).

Supply of Money: The supply of money refers to the total quantity of money in the country. However, the supply of money is a function of the rate of interest to some extent, yet it is taken to be fixed by the monetary authorities. Hence the supply curve of money is taken as perfectly inelastic given by a vertical straight line. Determination of the Rate of Interest Like the price of any product, the rate of interest is determined at the level where the demand for money equals the supply of money. In the figure, the vertical line QM shows the supply of money & L the total demand for money curve. Both the curve intersects at E2 where the equilibrium rate of interest OR is established.

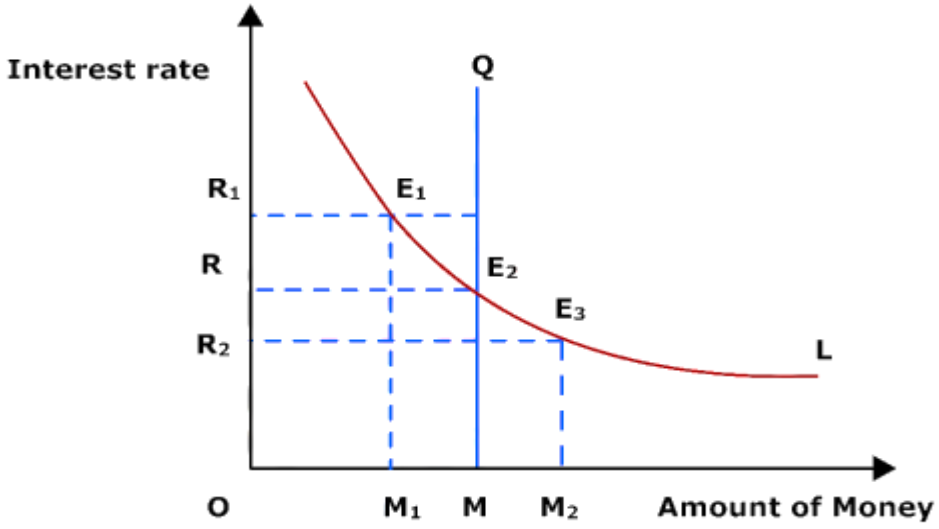

Fig.3.8.

If there is any deviation from this equilibrium position an adjustment will take place through the rate of interest, and equilibrium E2 will be established again. At the point E1 the supply of money OM is greater than the demand for money OM1. Consequently, the rate of interest will start declining from OR1 till the equilibrium rate of interest OR is reached. Similarly, at OR2 level of interest rate, the demand for money OM2 is greater than the supply of money OM. As a result, the rate of interest OR2 will start rising till it reaches the equilibrium rate OR. It may be noted that, if the supply of money is increased by the monetary authorities, but the liquidity preference curve L remains the same, the rate of interest will fall. If the demand for money increases and the liquidity preference curve sifts upward, given the supply of money, the rate of interest will rise.

3.7. Consumption Function: Meaning and Attributes:

The Keynesian framework includes consumption, investment, government expenditure and net exports as the components of aggregate demand. The first two are the demand components that arise from the private sector. The present module attempts to discuss one of the most important components of aggregate demand, viz., consumption. There are several theories that attempt to explain the consumption behavior of individuals. For instance, one of the early theories by J.M. Keynes explained aggregate consumption behavior in terms of the Psychological Law of Consumption, wherein consumption is seen as a function of current income. Later theories of consumption such as Life cycle hypothesis and Permanent income theory have provided alternative explanations of consumption behavior. These theories build on Keynesian law of consumption that continues to be relevant even today. These theories suggest that consumption expenditure is more likely to depend on an individual's lifetime income rather than short term, temporary or transitory changes in income. Both these theories identify similar points and are often used together because of their similarity. This module discusses these theories on the consumption (and hence savings) pattern of individuals.

3.8. Factors Affecting Consumption:

The household final consumption expenditure (referred to as Consumption for simplicity) is the total of market value of all goods and services purchased by them. We defined consumption expenditure to include consumers spending on durable products such as automobiles, computers etc. as well as non-durable consumption goods like food and beverages, clothing etc. as well as services including health, transport and education etc., both on domestic and foreign produce. Consumption accounts for sizeable fraction of aggregate demand. As per World Bank national accounts data, in India, it was almost 60% of gross domestic product (GDP) over the period 2010 to 2014. Moreover, it has remained fairly stable over time as it was about 56.2% during 1995 to 1999. Thus, it has continued to account for a significant proportion of GDP. Consumption is an important indicator of living standards of individual and societies; hence, it is important to study the

determinants of consumption. Consumption decisions depend on a number of factors such as current income, rate of interest, expectations about the future, price levels and wealth. These are explained in detail:

1. Current Income:

The relationship between consumption and current income is captured by the Keynesian Absolute Income Hypothesis. Keynes suggested a positive relation between consumption and current income. As income rises, so does consumption. This is a movement along the consumption curve (that depicts the relation between consumption and income). Change in the factors other than income mentioned above, result in a shift of the consumption curve.

2. Household Wealth:

Wealth of a household comprises property, cars, savings in banks, bonds, cash as well as human wealth. The higher the accumulated wealth, higher is the likely consumption expenditure. E.g., a fall in stock (equity) prices results in decline in wealth and hence induces a fall in consumption. This results in a downward shift of the consumption curve.

3. Price Levels:

An increase in price levels reduces the real income as well as wealth of the households. As a result, the consumers are likely to reduce their spending.

4. Rate of Interest:

A change in rate of interest sets in operation two effects: substitution effect and income effect. Substitution effect works to reduce consumption (and hence raise savings) in case of a rise in interest rate. A higher rate of interest results in less spending on items purchased on credit such as automobiles or consumer durables such as washing machines, refrigerators etc. But, the income effect (due to rise in interest income) works to increase consumption (and hence reduce savings). The actual impact of change in interest rate on consumption will depend upon the relative strengths of substitution and income effect. The substitution effect is likely to be stronger at low-income levels while income effect is likely to be stronger at higher income levels.

5. Future expectations regarding Income, Price and rate of interest:

The consumption levels are likely to be affected by consumer's expectations regarding several indicators such as income, price or rate of interest. The consumption expenditure is assumed to depend positively upon future increases in income. E.g., expectation of getting a good job in the future may increase consumption levels. On the contrary, fear of losing a job (perhaps due to recession in the economy) might reduce consumption expenditure even before the job loss takes place. An expectation of rise in price or rate of interest in near future might result in greater spending today. Based on some of these factors, several theories are formulated. These are discussed in the following sections of this module.

The consumption function or propensity to consume refers to income, consumption relationship. It is a functional relationship between two aggregates, i.e, total consumption and gross national income. Symbolically, the relationship is represented as C=f(Y), where C is consumption, Y is income and F is the functional relationship. Thus, the consumption function indicates a functional relationship between C and Y, where C is dependent and Y is the independent Variables. C is determined by Y. this relationship is based on the ceteris paribus (other things being equal) assumption as such only income consumption relationship is considered and all possible influences on consumption are held constant.

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UNIT - IV

THEORIES OF CONSUMPTION

4.1. Introduction

The famous economist J.M. Keynes in his well-known book "General Theory of Employment, Interest and Money" stated that the volume of employment in the economy depends upon the level of effective demand. The level of effective demand is determined by the aggregate demand function and aggregate supply function. In the simple Keynesian consumption model, the author made use of primarily two components of aggregate demand viz. consumption and investment. Aggregate demand is defined as the total amount of goods and services produced in an economy at a given price and in a given time period. The various components of aggregate demand include consumption, investment, government expenditure and net exports.

Aggregate demand (AD) = C + I + G + NX

Where, C = Consumption, I = Investment G= Government expenditure and NX = Net exports which can be further broken down into Exports (X) minus Imports (M).

Consumption is the largest component of aggregate demand and plays an important role in its calculation. The counterpart of consumption is saving; it is that part of income which is not spent on consumption. For this reason, analyzing consumption is important for saving is a precondition for capital accumulation and long run growth. It thus becomes imperative to study consumption since it not only helps in capital accumulation and long run growth but it also plays an important role in business cycle fluctuations as well as economic welfare. Therefore, before we begin to examine the various theories of consumption let us first define consumption. Consumption is defined as the total amount of goods and services that the people in an economy purchase for immediate consumption. Economists pay immense attention to consumer's expenditure because they are interested in the economic welfare, which to a large extent comes from the utility people get from consuming goods and services. The two most substantial components of consumption expenditure are housing including rent, interest payments, maintenance and utilities and transportation. The largest component of

consumption is of services and non-durable goods the next largest. Durable consumption includes spending on durable goods such as automobiles, household equipment, furniture etc., and non-durable consumption includes spending on nondurable goods such as food, clothing, gas and energy and services such as housing operations, medical care, and recreations etc.

4.2. The Consumption Function

The consumption of a commodity depends upon the level of income. The consumption function refers to an empirical income consumption relationship. It is a functional relationship indicating how consumption varies as income varies. It is a simple relation between two aggregates – Income (Y) and Consumption (C).

Symbolically, the relationship is represented as C = f (Y)

Where, C: Consumption, Y: Income and f is the functional relationship.

In the functional relation, consumption is the dependent variable and income is the independent variable. Apart from income there are other factors as well however, consumption function represents a functional relationship between income and consumption based on ceteris paribus (other things being constant) assumption. For understanding consumption, we also need to analyses its counterpart i.e., saving. Saving is that part of the disposable income what people do not spend. The level of savings in a country is a crucial determinant of its long run steady state. Thus, we can say that,

Income = Consumption + Saving

Y = C + S or, Y – C = S

Both consumption spending and saving are explained by the level of income and the relationship between consumption saving and the level of income are shown by the consumption function and the saving function respectively. This module develops the essential of these concepts and works through the mechanics of the technical attributes of both consumption and saving.

4.3. Simple Keynesian Consumption Function

A large amount of material has been written on consumption function but the most famous and perhaps the most studied paper is J.M. Keynes' General Theory of Employment, Interest and Money published in 1936. The work covered many areas of economic theory however the most relevant here, is the

influence of an individual's income on personal consumption. The consumption function in the simple Keynesian model is defined by the following equation C = a + bY

Where, C: Consumption, a: Autonomous Consumption, b = dC/ dY: Marginal Propensity to Consume and Y: Income

The equation shows that the consumption level of an individual is influence by an autonomous consumption (a) and a constant fraction of income (bY). Keynes theorized that there will always be some amount of consumption even when the income is zero. This is called the autonomous consumption and will always be positive. This is the first essential characteristic of the Keynesian consumption function. Secondly, the theory states that current consumption depends on current income alone and with the increase in income the consumption also increases. However, due to marginal propensity to consume (C), consumption increases with the increase in income but less than proportionately. In other words, as income increases, consumers do not spend the entire income. They spend part of it and choose to save the rest. This aspect can be better understood if we dwell into Keynes psychological law of consumption.

4.4. Keynesian Psychological Law of Consumption

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

1. When income increases, consumption spending also increases but less than proportionately implying that as income increases individuals wants also get satisfied alongside and as a result the need to spend more on consumer goods diminishes. This does not imply that consumption spending falls with

increase in income in fact it increases with increase in income but by a smaller amount.

2. The part of the increased income that is not spent is saved. Thus, the increased income is divided between consumption and saving.

3. Increase in income always leads to an increase in both consumption and saving. This is based on the above propositions because an increase in income increases consumption but less than proportionately which leads to an increase in saving.

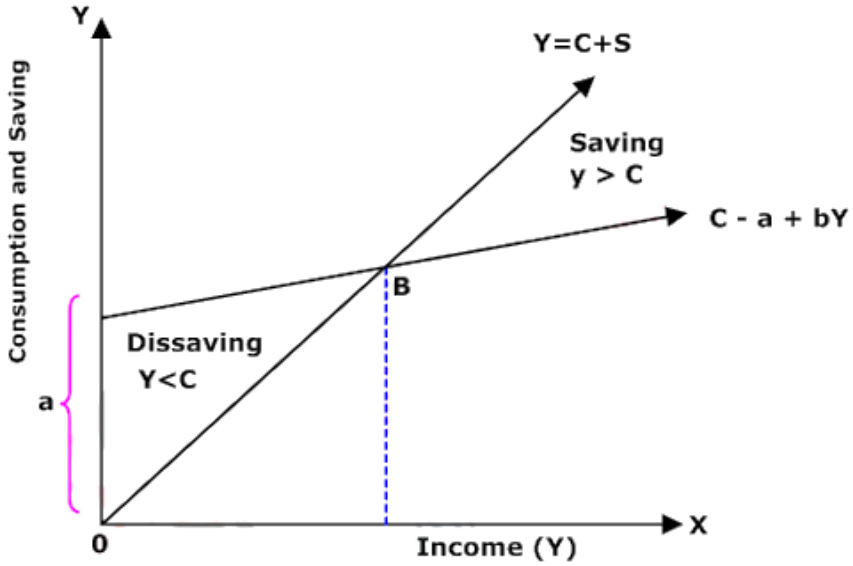

Fig. 4.1: Simple Keynesian Consumption Function

In the above diagram 4.1, income is measured on the X-axis and consumption and saving is measured on the Y-axis. The line passing through the origin shows income is equal to consumption plus saving (i.e. Y = C + S). The consumption function C = a + bY indicates that even if income is zero consumption will not be zero in other words, at zero income, consumption is positive. Thus, consumption function is a schedule of various amounts of consumption expenditure corresponding to different level of income. Also, when income is greater than consumption (Y > C) there is saving and when income is less then consumption (Y < C) there is dissaving.

4.5. The Technical Attributes of Consumption Function

In this analysis Keynes has used technical attributes or properties of consumption function: Average propensity to consume (APC) and Marginal propensity to consume (MPC) which are discussed below.

4.5.1. Average Propensity to Consume

The average propensity to consume refers to the ratio of consumption spending to any particular level of income.

Symbolically, it is denoted as APC = C / Y

Where, C: Consumption and Y: Income, expressed as the percentage of income consumed.

For instance, if the income is said Rs 40 and consumption is Rs 20 then APC = C/Y = 20/40 = 1/2 = 0.5; which implies that 50% of the income will be used for consumption spending. However, the APC declines as income increases because the proportion of income spent on consumption decreases as explained by the above proportions. The average propensity to consume at any level of income is expressed in equation as C/Y.

4.5.2. Marginal Propensity to Consume

The Marginal Propensity to Consume (MPC) refers to the rate of change in consumption (ΔC) resulting from a change in income (ΔY). Marginal Propensity to Consume indicates the proportion of additional income that is used for consumption. MPC is the slope of the consumption function.

Symbolically, it is denoted as MPC = ΔC / ΔY

Where, ΔC: Change in consumption, ΔY: Change in Income.

For instance, let us suppose that income increases from Rs 40 to Rs 60 and the consumption spending rises from Rs 30 to 37. MPC = ΔC/ ΔY = 60-40 /30-37 = 20/7 MPC = 2.85 There are three important points to note here, according to Keynes, the value of MPC will always lie between zero and one (0 < MPC > 1). Secondly, the marginal propensity to consume is important for filling the gap between income and consumption through planned investment to maintain the desired level of income and lastly, MPC is useful to the multiplier theory. Higher the MPC higher will be the multiplier and vice-versa.

4.5.3. Relationship between APC and MPC

The average propensity to consume and marginal propensity to consume are related and can be better understood from the following

- When the consumption function is linear (C = a + bY), as income increases, MPC is constant but APC is declining.
- In general, APC and MPC both decline as income increases but MPC

declines at a faster rate than the decline in APC.

- If the consumption function passes through the origin, APC and MPC will be equal and constant.

Table 4.1: The Consumption Function Schedule

Income (Y) (In rupees)	Consumption (C)	APC (C/Y)	MPC = (ΔC / ΔY)
10	11	10/11 = 1.1	9/10 = 0.9
20	20	20/20 = 1	5/10 = 0.5
30	25	25/30 = 0.83	5/10 = 0.5
40	30	30/40 = 0.75	5/10 = 0.5
50	35	35/50 = 0.7	2/10 = 0.2
60	37	37/60 = 0.61	1/10 = 0.1
70	38	38/70 = 0.54	2/10 – 0.2
80	40	40/80 = 0.5	

From the above schedule, one can easily infer that with the increase in the level of income, both average and marginal propensities to consume decreases and the reverse is true with the decrease in income. The simple Keynesian consumption function inhibits certain important properties that can be summarized as follows:

1. The marginal propensity to consume is positive but less than one.
2. The marginal propensity to consume is the same for any change in income.
3. APC is infinity at a zero level of income and decreases as income increases but is always greater than MPC.

4.6. Saving Function

The saving function is the counterpart of the consumption function. Saving is that part of income which is not consumed or spent. An individual income is divided into consumption and saving implying that some part of the income is used for consumption spending while the rest is saved. Thus, the saving function describes the relationship between saving and the level of income. It will change with the change in the level of income. Symbolically, it is denoted as S = f (Y) Where, S: Saving, Y: Income and f: functional relationship As put forth by J.M Keynes, that consumption expenditure and saving by the households depend on the level of income and only a portion of additional income is used for consumption, with the rest used for saving. Indicating,

Y = C + S ……(i)

C = a + b Y ……(ii)

Now substitute equation (ii) in (i) then,

Y = a + bY + S

S = Y - a – bY

S = - a + Y – bY

S = - a + (1 – b) Y …. (iii)

So, equation (iii) is the saving function equation where (a) is autonomous saving, i.e. the amount of saving at zero level of income and (1- b) is marginal propensity to save. As income increases, saving of the household sector also increases. This can be explained with the help of one of the propositions, with the increase in income, consumption increases but less than proportionally. As a result, the rest of the increase in income goes into saving. This part of the income, the household sector can choose to keep for investment purpose also. The saving function is shown in the following diagram 4.2.

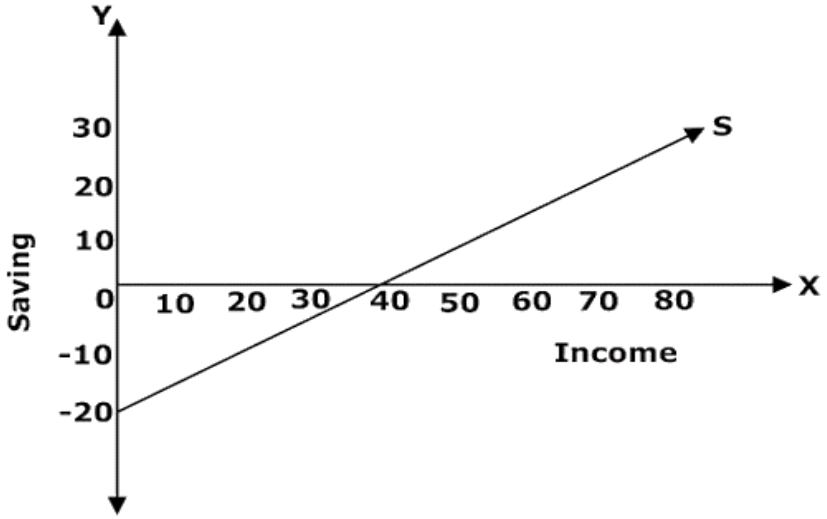

Fig.4.2: The Saving Function

It can be observed from both diagrams I and IV that when income is 40, consumption is 40 and saving is zero. According to Keynesian Consumption function, savings are positively related to the level of disposable income. At low levels of income, consumption spending may exceed income causing dissaving. When income is 20, consumption is 30 and saving is -10 and when income is 50, consumption is 40 and saving is 10. 6.

4.6.1. The Technical Attributes of Saving Function

In simple words, the propensity to save is nothing but a tendency to save.

Every individual who earns income has a tendency not to spend the entire amount, but to save some part of that income. This tendency to save part of the income is a propensity to save. There are technical attributes to propensity to save and these are discussed below.

4.6.2. Average Propensity to Save

Average propensity to save is defined as the ratio of total saving to total income. This ratio is given by S / Y. It is the saving counterpart to the average propensity to consume. Symbolically, it is denoted as APS = S / Y

As APC is the ratio of consumption to the level of income, similarly APS is the ratio of saving to the level of income. For instance, if the income of an individual is said Rs 100/- and saving is said Rs 50/- then the average propensity to save will be 1/2 or 0.5, i.e., 50 per cent of income is saved and the remaining 50 per cent is consumed.

Relationship between Average Propensity to Consume and Average Propensity to Save

APS is a counterpart of APC; both together constitute total income. It can be derived as follows:

$Y = C + S$

Divide both sides by Y, we get, $Y/Y = C/Y + S/Y$

$1 = APC + APS$

$APC + APS = 1$

or, $APC = 1 - APS$

As income increases, APC decreases then APS must increase as income increases because these two ratios add up to 1 at all levels of income.

4.6.3. Marginal Propensity to Save

Just as the APS is the counterpart of APC, MPS is the counterpart to MPC. The marginal propensity to save is defined as the ratio of the change in saving to the change in income, for any change in income.

Symbolically, it is expressed as $MPS = \Delta S / \Delta Y$

Where, ΔS is change in saving and ΔY is the change in the level of income.

Relationship between Marginal Propensity to Consume and Save

Similarly, one can derive the relationship between marginal propensity to consume and save given, $Y = C + S$

A change is income would bring a change in consumption and saving implying $\Delta Y = \Delta C + \Delta S$

Similarly divide Y both sides, we derive: $\Delta Y/ \Delta Y = \Delta C/ \Delta Y + \Delta S/ \Delta Y$

1 = MPC + MPS

MPC and MPS also add up to one. If MPC is positive but less than one, then it follows by subtraction because MPS = 1 – MPC, that is MPS must also be positive but less than 1. Furthermore, if the APC is always greater than the MPC, it follows that's APS is always less than MPS.

Based on some of these factors, several theories are formulated. These are discussed in the following sections.

4.7. Keynesian Absolute Income Hypothesis

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

1. As income increases, average propensity to consume (APC = C/Y) falls.

2. The marginal propensity to consume (MPC) is positive but less than unity (0 < c < 1) so that higher income leads to higher consumption.

3. The consumption expenditure increases (or decreases) with increase {or decrease) in income but non-proportionally. This non-proportional consumption function implies that in the short-run average and marginal propensities do not coincide (APC > MPC).

4. This consumption function is stable both in the short-run and the long-run. This consumption function is explained in Fig. 1 where C = a + cY is the consumption function. At point E on the C curve the income level is OY1. At this point, APC > MPC where APC = OC1/OY1 and MPC = $\Delta C/\Delta K$ = ER/REO.

This shows disproportional consumption function. The intercept a show the level of consumption corresponding to a zero level of income. At income level OY0, where the curve C intersects the 45″ line, point E0 represents APC (=OC0 / OY0). Below the income level consumption is more than income. In this range, APC > 1. Above the income level OY0, consumption increases less than proportionately with income so that APC declines and it is less than one.

4.8. Permanent Income Hypothesis

Introduction

Milton Friedman is the most influential economist of the last fifty years and, perhaps with John Maynard Keynes, the most influential of the entire 20thcentury. His theories and research continue to shape public policy debates even to today. One of Friedman's most influential and revolutionary theories was his challenge to the traditional Keynesian consumption function, which includes simple after-tax income as a variable in the consumption. Friedman countered, however, that those who consume today take future taxes, price increases, salary increases, and other factors into account. He distinguished between permanent income and transitory income as affecting the consumption pattern. This is summarized in his Permanent Income Hypothesis. More specifically, this counters that people consume based off of their overall estimation of future income as well as opposed to only the current after-tax income Friedman and Kuznet's had written the decomposition of income into permanent income and transitory in early 1940s in the paper titled "Income from independent professional practice", but did not publish it. Milton Friedman's PI hypothesis generated from the basic fact that individuals would wish to smooth consumption and will not allow it to fluctuate with short run fluctuations in income. In fact, the model was developed to explain important empirical facts in a unified framework. For example, it was developed to answer questions such as why is income more volatile than consumption and why is the long run marginal propensity to consume out of income greater than the marginal propensity to consume in short run. Friedman hypothesized that individuals have a longer-term view of the income from which they base their consumption, perhaps a notion of lifetime wealth or a notion of wealth over long time period. The basic hypothesis posited is

that out of a permanent income in each period, individuals consume a fraction of it and hence the average propensity to consume would be equal to the marginal propensity to consume. There are a large number of factors that influence the propensity, such as the interest rate and the variables that changes the taste, or those that reflect uncertainty.

The two characters in Permanent Hypothesis theory are: Permanent and transitory, income and consumption. The magnitudes termed "permanent income" and "permanent consumption" that play such a critical role in the theoretical analysis cannot be observed directly for any individual consumer unit. Only actual receipts and expenditures are observed during some finite period, supplemented with some statements regarding the future expectations. The theoretical constructs of the theory usually have magnitudes that are ex ante in nature; and the empirical data are ex post. Yet in order to use the theoretical analysis to interpret empirical data, a correspondence must be established between the theoretical constructs and the observed magnitudes. The second character is the transitory component. Some of the factors that give rise to transitory components of income are specific to particular consumer units, for example, illness, a bad guess about when to buy or sell, and the like; and, similarly, chance errors of measurement. Consider a group of consumer units, for the resulting transitory components to average out, so that if they alone account for the discrepancies between permanent and measured income, the mean measured group income would be equal to the mean permanent component, and the mean transitory component would be zero. But not all factors giving rise to transitory components need be of this kind. Some of these may be usual to the group members, for example, in case of unusual good or bad weather, if the group of farmers are located in near places; or demand for a product shift suddenly, if the group consists of consumer units whose earners are employed in producing this product. If such factors are favorable for any period, the mean transitory component is positive, if they are unfavorable, it is negative. Similarly, a systematic bias in measurement may produce a nonzero mean transitory component in recorded data even though the transitory factors affecting consumer units have a zero effect on the average. On savings front,

the permanent income hypothesis generalizes the second implication of Fisher's analysis of inter temporal interest rates. According to Friedman, to increase today's consumption, the representative household borrows, when it anticipates higher income in the future. In other words, it saves less when it expects future income to be high. Conversely, the household uses additional savings to buffer its consumption against expected declines in income; it saves more when it expects future income to be low. Thus, like Fisher's theory of interest, Friedman's permanent income hypothesis suggests that data on savings help forecast future income.

4.8.1. Permanent Income Hypothesis (PIH)

Milton Friedman's Permanent Income hypothesis originates from the basic intuition that individuals would wish to smooth consumption and not let it fluctuate with short run fluctuations in income. He tried to explain, why income is more volatile than consumption and why is the long run marginal propensity to consume out of income higher than the short run one. To answer these questions, he took that individuals base their consumption on a longer-term view of an income measure, perhaps a notion of lifetime wealth that is stretched over a long horizon. The basic hypothesis laid is that out of a permanent income, individuals consume only a fraction of it in each period and thus the average propensity to consume would be equal to the marginal propensity to consume. A large number of factors influence the propensity, such as the interest rate and taste shifter variables, or could reflect uncertainty etc. The parameters of Friedman's model are permanent consumption (cp), permanent income (yp), transitory consumption (ct), and transitory income (yt). Measured income is the sum of permanent and transitory income ((yt) and measured consumption is the sum of permanent and transitory consumption (ct), i.e

$C=cp+ct$ *and* $y= yp+yt$ Permanent consumption is then determined by

$$Cp = k\ yp$$

So permanent consumption is a function of permanent income only where k is constant (assumed). Thus, transitory component reflects genuine fluctuations or measurement error. The main point to focus on is that the consumption level does not depend on the components that are transitory in

nature. The empirical content to this hypothesis could be provided by adding the assumptions that the transitory components are uncorrelated to each other and uncorrelated to the component that is permanent. The proportion or fraction k of permanent income that is consumed depends upon the following factors:

1. Rate of interest (i): at a higher rate of interest the people would tend to save more and the consumption expenditure will decrease. The lowering of rate of interest will have opposite effect on the consumption.

2. The proportion of non-human wealth to human wealth: the relative amounts of income from physical assets and income from labor also affects consumption expenditure. This is denoted by the term "w" in the permanent income hypothesis. Friedman suggests that consumption expenditure depends a good deal on the wealth or assets possessed by people to consume and vice versa.

3. Desire to add to one's wealth: lastly, the household's preference for immediate consumption as against the desire to add to the stock of wealth or assets also determines the proportion of permanent income to be devoted to consumption. The desire to add to one's wealth rather than to fulfill one's wants of immediate consumption is denoted by "u".

Thus, rewriting the consumption function based on Friedman's permanent income hypothesis we have $Cp=k\ (i, w, u)\ yp$

The above function implies that permanent consumption is function of permanent income. The proportion of permanent income devoted to consumption depends on the rate of interest, the ratio of non-human wealth of labor income and desire to add to one's wealth.

4.8.2. Permanent and Transitory Income

In addition to permanent income, the individual's income may contain a transitory component that Freidman calls as transitory income. A transitory income is a temporary income that is not going to persist in future periods. For example, a clerk in an office may get substantial income from the overtime work in a month which he thinks cannot be maintained. Thus, this large overtime income for a month will be transitory component of income. According to Freidman, transitory income is not likely to have much effect on

the consumption. Thus, income of an individual contains of two parts, permanent income and transitory income Measuring permanent income: To make the permanent income hypothesis operational it is needed to measure permanent income. permanent income as is generally defined is the steady rate if consumption a person would maintain for the rest of his or her life given the present level of wealth and income now and in future. However, it is very difficult to a person to know what part of any change in income is likely to persist and is therefore permanent and what part would not persist and is therefore transitory. Friedman has suggested a simple way of measuring permanent income by relating it to the current and past incomes. According to him, permanent income is equal to the last year's income plus a proportion of change in income occurred between last year and the current year. Thus, permanent income can be measured as under:

$yp = yt{-}1 + a\,(yt - yt{-}1)$ … … ..... (1)

$yp = ayt + (1 - a)\,yt{-}1$ … … …. … (2)

To illustrate this with an example. Suppose, the proportion of change in income in the last year and current year equals 0.6 and last year's income ($(yt{-}1)$ is Rs. 80,000 and the current year's income (yt) $is\ Rs.$ 85,000, then from the above equation permanent income can be estimated as under,

$$yp = 0.6(85{,}000) + (1 - 0.6)80{,}000$$

$$= 51{,}000 + 32{,}000 = 83{,}000$$

It is worthwhile to note the two features of the above equations estimating permanent income. First if, $yt = yt{-}1$, it implies that current year's income is equal to the last year's income. This further means that last year income is being maintained and therefore the individual would expect to earn the same income in the future also. In this case then permanent income is equal to the current or last year's income; secondly, when income of an individual increases in the current year as compared to the last years, the permanent income will be less than year's income. This is because the unsure nature of the individual about whether the increase in income will be carried in the future as well and therefore does not immediately revise his estimate of permanent income by the full amount of the increase in his income in the current year.

4.8.3. Implications of Permanent Income Hypothesis:

The two simple premises on which permanent income hypothesis is based on are: 1) that individuals wish that their expected marginal utility of consumption gets equated across time and 2) that individuals are able to make changes by saving and dis-saving to a change in income. Because consumers are making their consumption decisions based on lifetime resources, the PIH implies that today's consumption will respond differently to changes in today's income depending on whether the income changes are expected vs. unexpected, or temporary vs. permanent. The PIH provides a sharp contrast to Keynesian consumption rules which assume consumers make their consumption decisions based only on current income. There have been other attempts to explain consumption behavior by different economists. The reason the permanent income hypothesis has endured so much is that, beyond its simple intuitive appeal, is because it is a special case of an intertemporal optimization model of consumer behavior. This model has its roots in the works of Irving Fisher (1907) and Ramsey (1928) and has since been developed in many directions. The permanent income hypothesis includes the notion of shocks to income, which may reflect real but transient or even permanent fluctuations to income, the theoretical framework allows for uncertainty. Another implication of this theory is that the elasticity of consumption with respect to current income should vary systematically with the degree of permanence in the changes to households' income. In particular, the elasticity should be higher the greater is the fraction of the variation in household income that is due to permanent changes The dynamic of the PIH model for an oil producer country implies that the government should use oil revenue only for financial investments and then finance the post oil consumption by interest from these financial investments. Indeed, if one can note the implementation of low return projects in the developing countries during the oil boom periods, it is not relevant in view of their infrastructure needs to remove physical investments from the analysis. Excepted the fiscal sustainability, the adoption of the PIH does not seem to substantially improve the economics performances in the context of oil depletion, as it sacrifices the present spending for the future generation. However, as this fiscal framework

favors more capital accumulation, through a more contained deficit; it generates a slight better medium and long run growth. The PIH helps explain the failure of transitory Keynesian demand management techniques to achieve its policy targets. In a simple Keynesian framework, the marginal propensity to consume (MPC) is assumed constant, and so temporary tax cuts can have a large stimulating effect on demand. The permanent income hypothesis framework suggests that a consumer will spread out the gains from a temporary tax cut over a long horizon, which results in a smaller stimulus effect.

4.9. Relative Income Theory of Consumption:

An American economist J.S. Duesenberry put forward the theory of consumer behaviour which lays stress on relative income of an individual rather than his absolute income as a determinant of his consumption. Another important departure made by Duesenberry from Keynes's consumption theory is that, according to him, the consumption of a person does not depend on his current income but on certain previously reached income level.

According to Duesenberry's relative income hypothesis, consumption of an individual is not the function of his absolute income but of his relative position in the income distribution in a society, that is, his consumption depends on his income relative to the incomes of other individuals in the society. For example, if the incomes of all individuals in a society increase by the same percentage, then his relative income would remain the same, though his absolute income would have increased. According to Duesenberry, because his relative income has remained the same the individual will spend the same proportion of his income on consumption as he was doing before the absolute increase in his income. That is, his average propensity to consume (APC) will remain the same despite the increase in his absolute income. As mentioned above, empirical studies based on time-series data made by Kuznets reveal that over a long period the average propensity to consume remains almost constant. Now, Duesenberry's relative income hypothesis suggests that in the long run the community would continue to consume the same proportion of income as its income increases.

According to Duesenberry, saving as a proportion of income of the individuals with relatively low incomes would not rise much with the increase in their incomes. That is, their savings would not rise to the same proportion of income as was being done by the individuals who had the same higher income prior to the present increase in income. This is because with the increase in incomes of all individuals by the same proportion, the relative incomes of the individuals would not change and therefore they would consume the same proportion of their income. This applies to all individuals and households. It therefore follows that assuming that relative distribution of income remains the same with the growth of income of a society, its average propensity to consume (APC) would remain constant.

Thus, this conclusion of the relative income hypothesis differs from the Keynesian theory of consumption according to which, as seen above, as absolute income of a community increases, it will devote a smaller proportion of its income to consumption expenditure, that is, its APC will decline. It is important to note that relative income theory implies that with the increase in income of a community, the relative distribution of income remaining the same, does not move along the same aggregate consumption function, but its consumption function shifts upward. Since as income increases, movement along the same consumption function curve implies a fall in average propensity to consume, Duesenberry's relative income hypothesis suggests that as income increases consumption function curve shifts above so that average propensity to consume remains constant.

This is illustrated in Figure 4.3. Suppose a family A' has Y_1 level of income and is spending Y_1A' on consumption. Suppose its income level rises to Y_2. Now, its consumption would not rise only to Y_2B (i.e. equal to the consumption of the family B at Y_2 income level) but to Y_2A' where A' lies on the same ray from the origin as the previous point A of consumption. This implies that the consumption expenditure of family A has risen in the same proportion as its income with the result that its average propensity to consume remains constant.

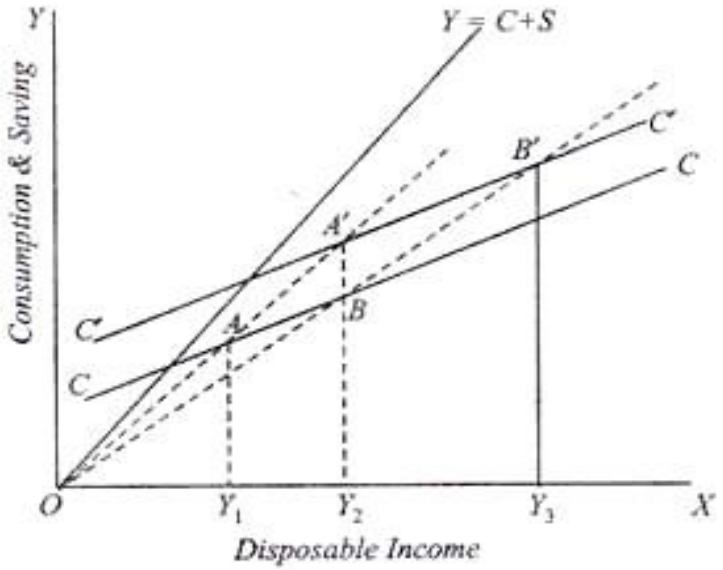

Fig.4.3. Duesenberry Relative Income Theory of Consumption

Likewise, if income of family B which is having consumption expenditure Y_2B at income level Y_2, rises to Y_3, its consumption expenditure will increase to Y_3B' where B' lies on the same ray from the origin as B. This again means that the proportion of income devoted to consumption by family B (i.e. its APC) remains constant as there is increase in its absolute income. Thus, if the proportion of income devoted to consumption of the average family at each income level remains the same as its income increases, the aggregate consumption of the community as proportion of its income will also remain constant though its absolute consumption and absolute savings will increase with the absolute increase in income. As income increases and a society moves along the same consumption function curve, its average propensity to consume falls. But Duesenberry's relative income hypothesis suggests that as income increases consumption function curve shifts above so that average propensity to consume remains constant. In Figure 4.3. it will be seen that if points A' and B' are joined together, we get, a new consumption function curve C'C'.

4.9.1. Demonstration Effect:

By emphasising relative income as a determinant of consumption, the relative income hypothesis suggests that individuals or households try to imitate or copy the consumption levels of their neighbours or other families in a particular community. This is called demonstration effect or Duesenberry

effect. Two things follow from this. First, the average propensity to consume does not fall. This is because if incomes of all families increase in the same proportion, distribution of relative incomes would remain unchanged and therefore the proportion of consumption expenditure to income which depends on relative income will remain constant.

Secondly, a family with a given income would devote more of his income to consumption if it is living in a community in which that income is regarded as relatively low because of the working of demonstration effect. On the other hand, a family will spend a lower proportion of its income if it is living in a community in which that income is considered as relatively high because demonstration effect will not be present in this case.

For example, the recent studies of household expenditure made in India reveal that the families with a given income, say Rs. 5000 per month spend a larger proportion of their income on consumption if they live in urban areas as compared to their counterparts in rural areas. The higher propensity to consume of families living in urban areas is due to the working of demonstration effect where families with relatively higher income reside who's higher consumption standards tempt others in lower income brackets to consume more.

4.9.2. Ratchet Effect:

The other significant part of Duesenberry's relative income hypothesis is that it suggests that when income of individuals or households falls, their consumption expenditure does not fall much. This is often called a ratchet effect. This is because, according to Duesenberry, the people try to maintain their consumption at the highest level attained earlier. This is partly due to the demonstration effect explained above. People do not want to show to their neighbours that they no longer afford to maintain their high standard of living. Further, this is also partly due to the fact that they become accustomed to their previous higher level of consumption and it is quite hard and difficult to reduce their consumption expenditure when their income has fallen. They maintain their earlier consumption level by reducing their savings. Therefore, the fall in their income, as during the period of recession or depression, does not result in decrease in consumption expenditure very much as one would

conclude from family budget studies. where on the X-axis we measure disposable income and, on the Y-axis the consumption and savings. Starting with disposable income of zero, we assume that there is steady growth of disposable income till it reaches Y_1 .The linear consumption function C_{LR} is the long- run consumption function. It will be seen from the figure that at Y_1 level of disposable income, the consumption expenditure equals Y_1C_1 .Now suppose with initial income level Y_1 there is recession in the economy with the result that disposable income falls to the level Y_0.

According to Duesenberry, consumption would not fall greatly to the level Y_0C_0 as the long-run consumption function curve C_{LR} would suggest. In their bid to maintain their consumption level previously reached people would now save less and reduce their consumption level only slightly to $Y_0C'_0$ whereas point C'_0 is on the short- run consumption function curve C_{SR}. Since $Y_0C'_0 > Y_0C_0$, the average propensity to consume at income level $Y_0$is greater at C'_0 than at C_1 at income level Y_1 (A ray drawn from the origin to the point C'_0 will have greater slope than that of OC_1). When the economy recovers from recession and disposable income increases, the economy would move along the short-run consumption function curve C_{SR} till the consumption level C_1 is reached at income level Y_1. Beyond this, with the growth of income the consumption will increase along the long-run consumption function curve CL_R.

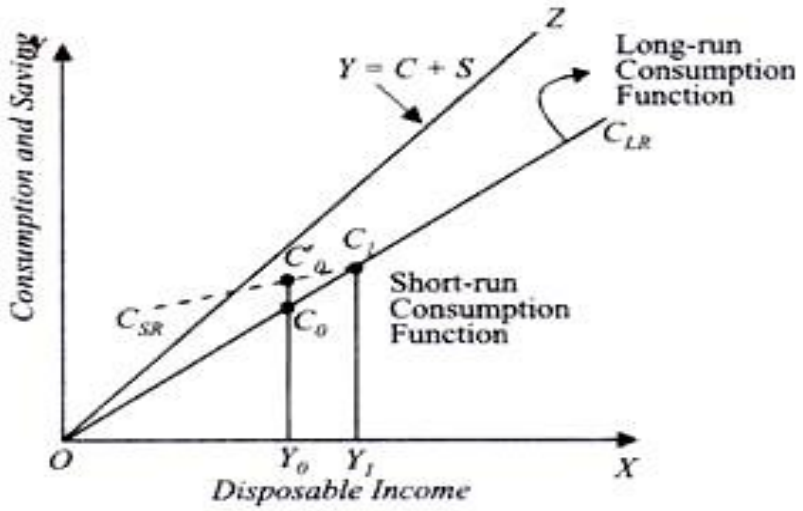

Fig.4.4. Duesenberry Ratchet Effect

4.9.3. Theoretical and Empirical Issues:

Among many insights found in the General Theory, one of the most useful has been the consumption function. Prior to Keynes theory, consumption had been viewed as a passive residual, the amount of income remaining after saving. Since the decision to save was determined by the payment for the utility lost from consuming, consumption depended on the interest rate. However, Keynes thought that consumption was both more important and complicated. Since expenditure creates its own income, consumption fundamentally affects the level of economic activity. The motive for consumption ranges far beyond simple payments. There are not many people who would alter their way of living because the rate of interest has fallen or risen. As put by Keynes, spending and saving are influenced by a host of objectives, subjective needs, psychological habits etc. He recognized that people must consume to survive, for an individual habitual standard of life depends on his income and proposed the psychological law of consumption. However, from the time of its introduction, much criticism has been levied against the consumption function as analyzed by Keynes. Many critics claimed that it is incomplete, makes inconsistent predictions and underlines wrong consumption behaviour. The crucial debate has been that the consumption function as analyzed by Keynes is simplistic and short-sighted. Keynesian consumption implied that current consumption depends upon current income alone and at a point in time. This runs counter-intuitive to the idea of arriving at a generalized, long run or lifetime spending behaviour. Modigliani and Brumberg argued that if a rational individual would base consumption decisions at any point of time on income at that point of time, that is, if they maximize utility of consumption subject to an income constraint, then based on the idea that consumer units are forward-looking rational consumers should also seek to maximize the utility from lifetime consumption, subject to the constraint of lifetime income. Such an aggregated analysis gave rise to the result that consumption is less dependent on the current level of income and also to transitory changes in income. Instead, consumption is more responsive to the permanent income (average of lifetime income). This is because when a transitory gains or losses to income is spread

over the lifetime flow of incomes, the per period gain/loss becomes small and its impact on consumption is negligible. This idea germinated in the work of Milton Friedman which we will discuss later. Another important aspect in the discussion of consumption function was the introduction of interest rates, as done by Romer, highlighted the requirement for consumption to be seen as a decision related over a series of periods rather than one made in isolation. There are a few empirical issues related to the Keynesian consumption function which is as follows. The empirical testing of the Keynesian consumption function has given mixed evidence. The utilization of either cross sectional data or time series data greatly affects the results. We have shown the consumption function as being linearly dependent on income, but this assumption was tested by Kuznets who suggested that consumption was a proportion of income rather than a function of it. There are three main problems faced in the empirical testing of the consumption function.

1. The psychological law of consumption could not reconcile the estimates of cross-sectional marginal propensities.
2. The model, $C = a + bY$, when transformed into an average consumption model, $C/Y = a/Y + b$ predicted a long run declining spending rate and rising saving rate. That is, an increase in Y cause a/Y to decline and the average propensity to consume should fall. However, it has remained stable.
3. Consumption functions estimated with cross sectional data showed shifting or ratcheting spending from one dataset or year to another. Such behavior was not found with time series data and could not be explained. These problems rose based on the understanding of the cross-sectional data and time series data with information from the same consumer unit. This was later resolved as it was observed that cross sectional data is data from a consumer at a point of time and time series data is data on the average behaviour of all consumers over periods of time. Another criticism about the Keynesian consumption function was that it did not explain the different determinants of the average propensity to consume. The Keynesian function did not explain that the average propensity to consume depends on the income level, demographic and age of the spending unit.

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UNIT-V

INVESTMENT FUNCTION

5.1. Introduction

Investment in macroeconomics analysis refers to the value of that part of the aggregate output for any given time period which takes the form of new structures, new capital equipment and changes in business inventories. It, thus refers to the acquisition and increase in the real assets and expenditure on these real assets may include. (a) Production or purchase of new machinery, plant and equipment etc. (b) Creation of new physical assets such as roads, dams, canals, airport, power plants, and railway tracks etc. (c) Inventory building i.e., stocks of raw material, semi-finished goods and stocks of unsold finished goods.

Thus, investment in any economy is very important as it creates capital. It should include not only investment in real assets like plant and machinery but should also include human capital. Its aim is to increase the productive capacity and the efficiency of the economy. In accounting sense, savings and investment are always equal as it is based on the static approach. But in real sense the equality between the two should be seen in terms of planned and unplanned investment. While planned investment is the amount which all the firms plan or desire to invest known as ex-ante investment, the unplanned investment is the change in business inventories due to a discrepancy between total demand and total supply. If supply exceeds demand business inventories will increase. Actual investment known as ex-post investment is a sum of planned and unplanned investment and this actual investment equals savings at every level of income. Thus, in monetary terms the relationship between savings and investment is modeled rather than being an accounting identity. It is the unplanned investment in terms of stock and inventory which plays a balancing act in equating desired savings to desired investment though its effect on level of income. Since investment means creation of additional productive capacity and is taken in terms of the creation of real assets in the form of new structures, workshops, factors etc.; it should not include financial investment in the form of shares, debentures, govt. bond and equities etc. Because these are simply transfer of rights of the title and

the real capital of the economy is left unchanged. Investment expenditure in any economy is of two types (a) induced investment and (b) autonomous investment. Induced investment is a function of income and is undertaken as a result of change in the level of income and thus consumption. This type of investment depends on profit expectations as the entrepreneurs anticipate high sales of final goods. Any increase in the level of income and employment will increase the demand for consumer goods which in turn will push up the level of investment. This functional relationship between income and investment is depicted graphically as follows:

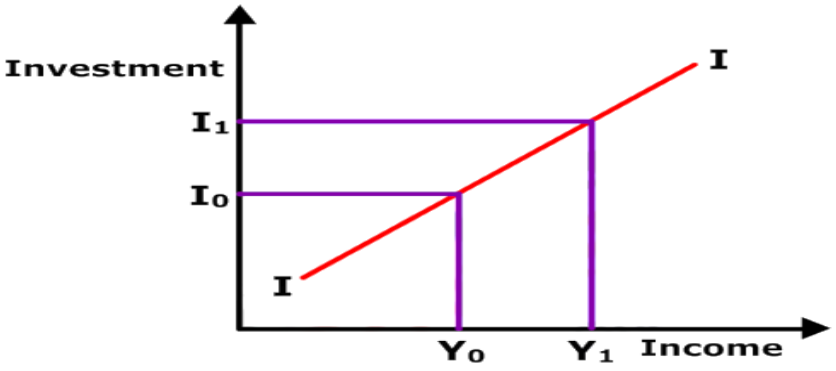

Fig.5.1.

By taking income on the X axis and investment on the Y axis we can draw an induced investment curve which slopes upward from left to right. It shows that induced investment is income elastic and goes on increasing as the income level in the economy increases. Autonomous investment on the other hand is independently determined by a large number of exogenous factors like population growth, technological changes and new inventions and discoveries. Levels of income and consumption expenditure do not have any impact on this type of investment. This investment is not affected by profit motive. Since autonomous investment remains unchanged at each level of income it is income inelastic. Since investment is shown graphically as follows:

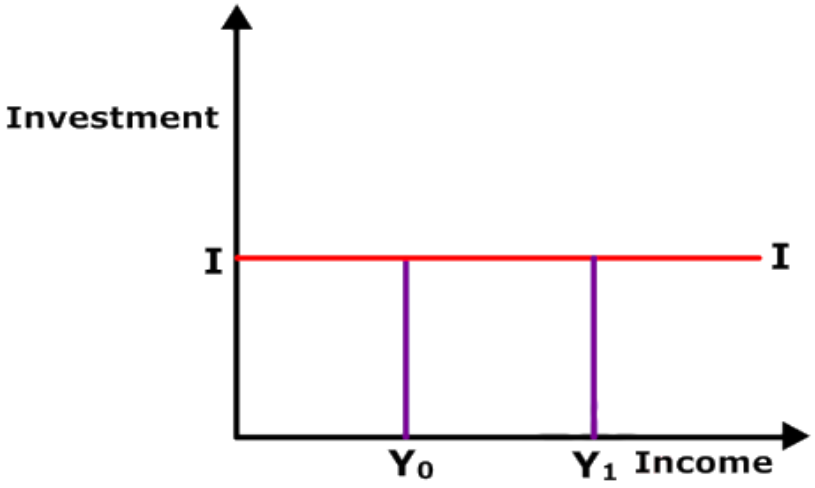

Fig.5.2.

The autonomous investment curve is constant at irrespective of the level of income and is represented by a horizontal straight line parallel to X axis. Investment decisions in any economy are also affected by the different sectors in which the investment expenditure is being done. The motivations for investment in the public and private sector are different. In the public sector profit maximization may not be the only basis for investment. The decisions here may be influenced by the social and political factors. The cost benefit techniques help in assessing the social profitability and the social cost of the proposed investment as the social welfare considerations are more important. On the other hand, investment decisions in the private sector are motivated by profit maximization. The expected profitability is the main motive of the private entrepreneurs. While investing in new machines or factories the private investors compare expected returns from an investment with its present cost to determine its profitability. To determine whether investment expenditure would be profitable or not, the expected returns from the asset are compared with the cost of financing investment which involves the concept of rate of interest. Keynes has used the concept of marginal efficiency of capital to measure the expected returns on the capital assets and has compared it with rate of interest in order to determine the investment decisions.

5.2. Meaning of Investment:

It is useful to make the meaning of investment clear. When a person buys shares, bonds or debentures of a public limited company from the market, it is generally said that he has made investment. But this is not the real investment which determines income and employment in the country and with which we are here concerned. Buying of existing shares and bonds by an individual is merely a financial investment.

When one individual purchase the shares or bonds, some other one would sell them. Thus, the purchase and sale of the shares merely represents the change in the ownership of assets which already exists rather the creation of new capital assets. It is the new addition to the stock of physical capital such as plant, machines, trucks, new factories and so on that creates income and employment. Therefore, by real investment we mean the addition to the stock of physical capital.

Thus, in economics, investment means the new expenditure incurred on addition of capital goods such as machines, buildings, equipment, tools, etc. The addition to the stock of physical capital i.e., net investment raises the level of aggregate demand which brings about addition to the level of income and employment in the economy. Keynes and many other economists also include the increase in the inventories of consumer goods in the capital of the country and therefore in the investment. There are two types of investment.

1.Autonomous Investment and 2. Induced Investment.

1. Autonomous Investment:

After Keynes two types of investments have been distinguished. One is autonomous investment and the second is induced investment. By autonomous investment we mean the investment which does not change with the changes in the income level and is therefore independent of income. Keynes thought that the level of investment depends upon marginal efficiency of capital and the rate of interest. He thought changes in income level will not affect investment. This view of Keynes is based upon his preoccupation with short-run problem.

He was of the opinion that changes in income level will affect investment only in the long ran. Therefore, considering as he was the short-ran problem he

treated investment as independent of the changes in the income level. In fact, the distinction between autonomous investment and induced investment has been made by post-Keynesian economists. Autonomous investment refers to the investment which does not depend upon changes in the income level. This autonomous investment generally takes place in houses, roads, public undertakings and in other types of economic infrastructure such as power, transport and communication.

This autonomous investment depends more on population growth and technical progress than on the level of income. Most of the investment undertaken by Government is of the autonomous nature. The investment undertaken by Government in various development projects to accelerate economic growth of the country is of autonomous type. The autonomous investment is depicted in Fig. 5.3. where it will be seen that whatever the level of national income, investment remains the same at I_a. Therefore, the autonomous investment curve is a horizontal straight line.

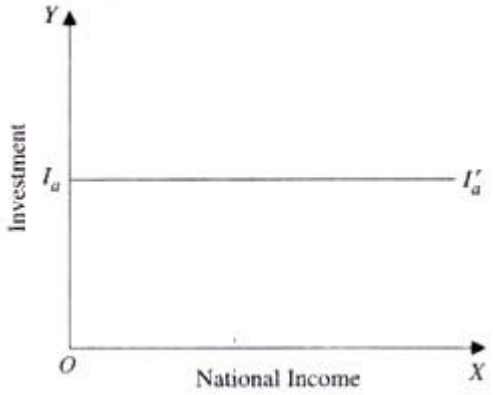

Fig.5.3. Autonomous Investment

2. Induced Investment:

Induced investment is that investment which is affected by the changes in the level of income. The greater the level of income, the larger will be the consumption of the community. In order to produce more consumer goods, more investment has to be made in capital goods so that greater output of consumer goods becomes possible. Keynes regarded rate of interest as a factor determining induced investment but the empirical evidence gathered so far suggests that induced investment depends more on income than on the rate of interest.

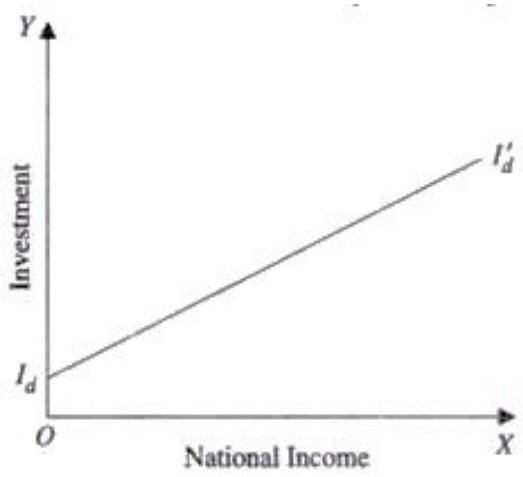

Fig.5.4. Induced Investment

Induced investment is shown in Fig. 5.4. where it will be seen that with the increase in national income, induced investment is increasing. Increase in national income implies that demand for output of goods and services increases. To produce greater output, more capital goods are required to produce them. To have more capital goods more investment has to be undertaken. This induced investment is undertaken both in fixed capital assets and in inventories. The essence of induced investment is that greater income and therefore greater aggregate demand affects the level of investment in the economy. The induced investment underlines the concept of the principle of accelerator, which is highly useful in explaining the occurrence of trade cycles.

5.3. Determinants of Investment:

Inducement to invest or investment demand depends upon two factors:

(1) Expected rate of profits to which Keynes gives the name Marginal Efficiency of Capital, and

(2) The rate of interest. It can be easily shown that investment is determined by expected rate of profit and the rate of interest.

A person having an amount of savings has two alternatives before him. Either he should invest his savings in machines, factories, etc., or he can lend his savings to others on a certain rate of interest. If investment undertaken in machines or factories is expected to fetch 25% rate of profit, while the current rate of interest is only 15%, then it is obvious that the person would invest his savings in machinery or factory.

It follows from above, if investment is to be profitable than the expected rate of profit must not be less than the current market rate of interest. If the expected rate of profit is greater than the market rate of interest, new investment will take place. If an entrepreneur does not invest his own savings but has to borrow from others, then it becomes much clear that the expected rate of profit from investment in any capital asset must not be less than the rate of interest he has to pay. For instance, if an entrepreneur borrows funds from others at 15% rate of interest, then the investment proposed to be undertaken will actually be undertaken only if the expected rate of profit from it is more than 15 per cent.

We thus see that investment depends upon marginal efficiency of capital on the one hand and the rate of interest on the other. Investment will be undertaken in any given form of capital asset so long as expected rate of profit or marginal efficiency of capital falls to the level of the current market rate of interest. The equilibrium of the entrepreneur is established at the level of investment where expected rate of profit or marginal efficiency of capital is equal to the current rate of interest. Therefore, the theory of investment is also based upon the assumption that the entrepreneur tries to maximize his profits.

Of the two determinants of inducement to invest, marginal efficiency of capital or expected rate of profit is of comparatively greater importance than the rate of interest. This is because rate of interest does not change much in the short run; it is more or less sticky. But changes in the expectations of profits greatly affect the marginal efficiency of capital and make it very much unstable and volatile. As a result of changes in marginal efficiency of capital, investment demand is greatly affected which causes aggregate demand to fluctuate very much. The changes in aggregate demand bring about economic fluctuations which are generally known as trade cycles. When profit expectations of businessmen are good, large investment is undertaken which causes aggregate demand to rise and bring about conditions of boom and prosperity in the economy. On the other hand, when expectations regarding profits are adverse, the rate of investment falls which causes decline in aggregate demand and brings about depression, unemployment and excess productive

capacity in the economy. Thus, the changes in the marginal efficiency of capital play a crucial role in causing changes in the investment level and economic activity. The theory of interest that, according to Keynes, the rate of interest is determined by liquidity preference and the supply of money. The greater the liquidity preference, the greater the rate of interest. Given the liquidity preference curve, the greater the supply of money, the lower will be the rate of interest. We have already studied how the rate of interest is determined. We explain below in detail the concept of marginal efficiency of capital and describe the factors on which it depends.

5.4. Marginal Efficiency of Capital:

MEC refers to the expected profitability of a capital asset. It may be defined as the highest rate of return over cost expected from the marginal or additional unit of a capital asset. First, we must go to the marginal unit of the capital asset and secondly its cost has to be deducted from its return.

Now the MEC in its turn, depends on two factors: the prospective yield of the capital asset and the supply price of the capital asset. The MEC is the ratio of these two factors. The prospective yield of a capital asset is the total net return from the asset over its life time.

The supply price of an asset is the cost of producing a brand-new asset of that kind and not the supply price of an existing asset. It is referred to as the replacement cost. If the supply price of a capital asset is Rs. 20,000 and its annual yield is Rs. 2000, then the marginal efficiency of this asset is 2000/20000 x 100 = 10 percent. Thus, the marginal efficiency of capital is the percentage of profit expected from a given investment on a capital asset.

Keynes relates the prospective yield of a capital asset to its supply price and defines MEC "as being equal to that rate of discount which would make the present value of the series of annuities given by the returns expected from the capital asset during its life equal to its supply price". This may be put in the form of an equation.

$$Sp = \frac{R_1}{(1+i)} = \frac{R_2}{(1+i)^2} + \ldots\ldots + \frac{R_n}{(1+i)^n} - \quad \ldots(1)$$

Where Sp is the supply price or the cost of capital asset, R_1,R_2... Rn are the

prospective yields or the series of expected annual returns from the capital asset in the years 1,2..... n, and i is the rate of discount. This makes the capital asset exactly equal to the present value of the expected yield from it. This can be explained with a numerical example.

Let us assume that:

1. The life time of a capital asset (n) is 2 years.
2. The supply price of the capital asset (Sp) is Rs. 3000.
3. The expected yield from the asset at the end of one year (R_1) is Rs. 1100.
4. The expected yield from the asset at the end of 2 years (R_2) is Rs. 2420.

The MEC or the rate of discount which will equate the future yields of the asset with its supply price is 10% as shown below:

$$\text{Since Sp} = \frac{R_1}{(1+i)} + \frac{R_2}{(1+i)^2}$$

$$\text{Rs. 3000} = \frac{1100}{1.10} + \frac{2320}{(1.10)^2}$$

$$\text{Rs. 3000} = \text{Rs. 1000} + \text{Rs. 2000}$$

In this way, discounted prospective yields of capital asset can be brought into equality with the current supply price. Thus, investment will take place only if the net prospective yield of an asset is greater than its supply price and given the income flow the higher the supply price of the capital asset, the lower will be the rate of discount.

Factors of Marginal Efficiency of Capital (MEC):

The various factors that bring about shifts in MEC are short run or endogenous factors and long rim or exogenous factors.

The short run factors are:

1. Expected demand:

If the demand for the product is expected to be high in future, the MEC will be high and the investment will increase. On the other hand, if the demand for the product is expected to decline in future the MEC will be low and investment will fall.

2. Costs and prices:

If the costs are expected to decline and if the prices are expected to increase, the expectation of the producer will go up. On the other hand, if the costs are

expected to go up and prices are to decline the MEC will receive a set back and the investment will be less.

3. Propensity to consume:

If the propensity to consume is more than the volume of investment will be more and vice versa.

4. Changes in income:

An increase in the level of income will stimulate investment while a decrease in the level of income will discourage investment

5. Current state of expectation:

Businessmen while making expectations take into account the current state of affairs regarding costs, prices, returns etc. If they are high the MEC is bound to be high for new projects of investment.

6. Level of confidence:

During period of optimism the businessmen over estimate and boost the MEC of capital assets. During period of pessimism, they under estimate and reduce the MEC of capital assets.

The long run factors which influence the MEC are as follows:

1. Population growth:

A rapidly growing population means a rapid increase in the demand for all types of goods and hence investment rises and conversely, a decline in population will decrease the demand investment.

2. Development of new areas:

When a new area is developed heavy investments in all fields such as agriculture, industries, electricity, housing etc., are to be undertaken.

3. Technological factors:

New invention or new discovery may necessitate the installation of new machineries in the industrial enterprise and encourage investment.

4. Productive capacity of the industry:

If the existing capacity is fully utilised then any further increase in demand will be met with by making fresh investment on new capital equipment.

5. Level of current investment:

If the existing level of investment is already high there will be little scope for further investment and vice versa.

5.5. Marginal Efficiency of Investment:

The expected profit from an investment, as percent of the investment, measures the rate of return on the investment. Economists call the expected rate of return on an addition to capital investment as the marginal efficiency of investment (MEI). More precisely, it is the expected rate of return over cost of an additional unit of a capital good. Thus, there can be MEI or expected rate of return of 25 percent for one type of investment, 15 percent for another, and so on. The figure 5.5 shows that, at any given time, a business firm is faced with a number of investment opportunities these may include:

- ❖ Renovating its existing plant
- ❖ Purchasing new machines
- ❖ Acquiring additional power facilities
- ❖ Installing a computer system

Each project competes for a firm's limited funds. However, some projects are expected to be more profitable—that is, to have a higher rate of return (or MEI) than others. In view of this, which projects should management select? Or, in other words, how much investment expenditure should management undertake? The first step in answering this question is to imagine that the management of a firm rank alternative investment projects in decreasing order of their MEIs.

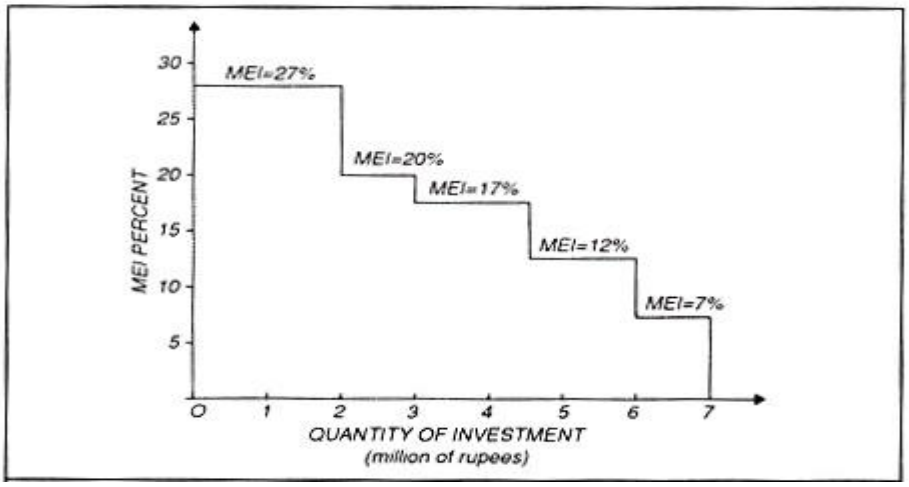

Fig.5.5 Marginal Efficiency of Investment for an Individual Firm

Figure, each project's cost and the corresponding MEIs are shown. The most attractive investment open to the firm is the renovation of its plant at a cost of Rs. 2 million. For this, the firm anticipates a rate of return, or MEI, of 27

percent, which is read from the vertical axis, the next most profitable investment is the addition of a new wing to its factory at a cost of Rs. 1 million, for which the MEI is 20 percent. Each remaining investment project is interpreted similarly.

If we assume that the risks of loss associated with these investments are the same, the descending order of MEI suggests two things:

1. Fewer investment opportunities are available to a firm at higher rates of return than at lower ones. For example, it is harder to find investment yielding 25 percent than to find investments yielding 10 percent.
2. A firm will tend to choose those investment projects which have the highest MEIs. Therefore, a project with a higher anticipated rate of return over cost is likely to be selected over a project with a lower one.

Figure 5.6. shows the solid stepped line as an individual firm's MEI curve. It shows the amount of investment the firm will make at various interest rates or cost of funds at any given time. The MEI curve is then the firm's demand curve for investment. These are many such stepped curves at any given time, one for each firm in the economy. The MEI curve for all firms. It is a smooth line obtained by summing individual MEI curves. It shows the total amount of private sector investment which will be made at various interest rates. The MEI curve in this chart is the economy's aggregate demand curve for private-sector investment.

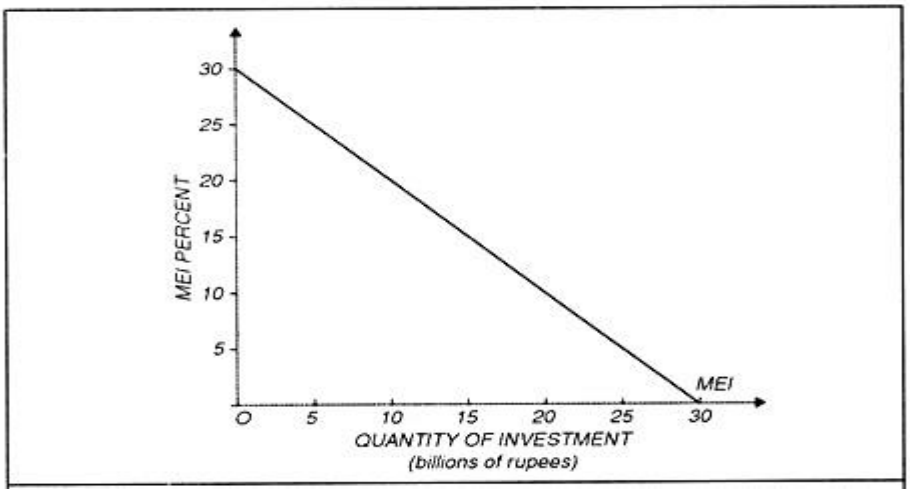

Fig.5.6 Marginal Efficiency of Investment for all firms

5.6. Theory of Multiplier:

The concept of multiplier was first developed by R.F. Kahn in his article "The Relation of Home Investment to Unemployment" in the Economic Journal of June 1931. Kahn's multiplier was the Employment Multiplier. Keynes took the idea from Kahn and formulated the Investment Multiplier. There are three types of multipliers. A. Investment Multiplier B. Dynamic Period of Multiplier C. Employment Multiplier.

1. The Investment Multiplier:

Keynes considers his theory of multiplier as an integral part of his theory of employment. The multiplier, according to Keynes, "establishes a precise relationship, given the propensity to consume, between aggregate employment and income and the rate of investment. It tells us that, when there is an increment of investment, income will increase by an amount which is K times the increment of investment" i.e., $\Delta Y=K\Delta I$.

In the words of Hansen, Keynes' investment multiplier is the coefficient relating to an increment of investment to an increment of income, i.e., $K=\Delta Y/\Delta I$, where Y is income, I is investment, Δ is change (increment or decrement) and K is the multiplier.

In the multiplier theory, the important element is the multiplier coefficient, K which refers to the power by which any initial investment expenditure is multiplied to obtain a final increase in income. The value of the multiplier is determined by the marginal propensity to consume. The higher the marginal propensity to consume, the higher is the value of the multiplier, and vice versa.

The relationship between the multiplier and marginal propensity to consume is as follows:

$$\Delta Y = \Delta C+\Delta I$$

or $$\Delta Y = c\Delta Y+\Delta I \qquad [\because \Delta C = c\Delta Y]$$

$$\Delta Y - c\Delta Y = \Delta I$$

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

$$\Delta Y = \frac{\Delta I}{1-c}$$

$$\frac{\Delta Y}{\Delta I} = \frac{1}{1-c}$$

$$K = \frac{1}{1-c} \qquad \left[\because K = \frac{\Delta Y}{\Delta I}\right]$$

Since c is the marginal propensity to consume, the multiplier K is, by definition, equal to 1-1/c. The multiplier can also be derived from the marginal propensity to sax e (MPS) and it is the reciprocal of MPS, K = 1/MPS. The table shows that the size of the multiplier varies directly with the MPC and inversely with the MPS. Since the MPC is always greater than zero and less than one (i.e., O < MPC < I), the multiplier is always between one and infinity (i.e., 1 < K < ∞).

If the multiplier is one, it means that the whole increment of income is saved and nothing is spent because the MPC is zero. On the other hand, an infinite multiplier implies that MPC is equal to one and the entire increment of income is spent on consumption. It will soon lead to full employment in the economy and then create a limitless inflationary spiral. But these are rare phenomena. Therefore, the multiplier coefficient varies between one and infinity.

TABLE I: DERIVATION OF THE MULTIPLIER

$\Delta C/\Delta Y(MPC)$	$\Delta S/\Delta Y(MPS)$ $[1-(MPC)]$	*K (Multiplier Coefficient)*
0	1	1
$\frac{1}{2}$	$\frac{1}{2}$	2
$\frac{2}{3}$	$\frac{1}{3}$	3
$\frac{3}{4}$	$\frac{1}{4}$	4
$\frac{4}{5}$	$\frac{1}{5}$	5
$\frac{8}{9}$	$\frac{1}{9}$	9
$\frac{9}{10}$	$\frac{1}{10}$	10
1	0	∞ (Infinity)

Working of the Multiplier:

The multiplier works both forward and backward. First, we study its forward working. The multiplier theory explains the cumulative effect of a change in investment on income via its effect on consumption expenditure.

Forward Operation:

We first take the "sequence analysis" which shows a "motion picture" of the process of income propagation. An increase in investment leads to increased production which creates income and generates consumption expenditure. This process continues in dwindling series till no further increase in income and expenditure is possible. This is a legless instantaneous process in a static

framework, as explained by Keynes. Suppose that in an economy MPC is 1/2 and investment is raised by Rs 100 crores. This will immediately lead to a rise in production and income by Rs 100 crores. One-half of this new income will be immediately spent on consumption goods which will lead to increase in

TABLE II: SEQUENCE MULTIPLIER

(Rs Crores)

(Round)	(Increment in Investment) ΔI	(Increment in Income) ΔY	(Increment in Consumption) ΔC = cΔY = 0.5	(Increment in Saving) ΔS = (ΔY − ΔS)
0				
1	100	100	50	50
2	—	50	25	25
3	—	25	12.50	12.50
4	—	12.50	6.25	6.25
5	—	6.25	3.12	3.12
0	—	0	0	0
Finally	100	200	100	100

production and income by the same amount, and so on. The process is set out in Table II. It reveals that an increment of Rs 100 crores of investment in the primary round leads to the same increase in income. Of this, Rs 50 crores are saved and Rs 50 crores are spent on consumption which go to increase income by the same amount in the second round. This dwindling process of income generation continues in the secondary rounds till the total income generated from Rs 100 crores of investment rises to Rs 200 crores. This is also clear from the multiplier formula, ΔY= KΔI or 200 = 2 x 100, where K = 2 (MPC = 1/2) and ΔI = Rs 100 crores.

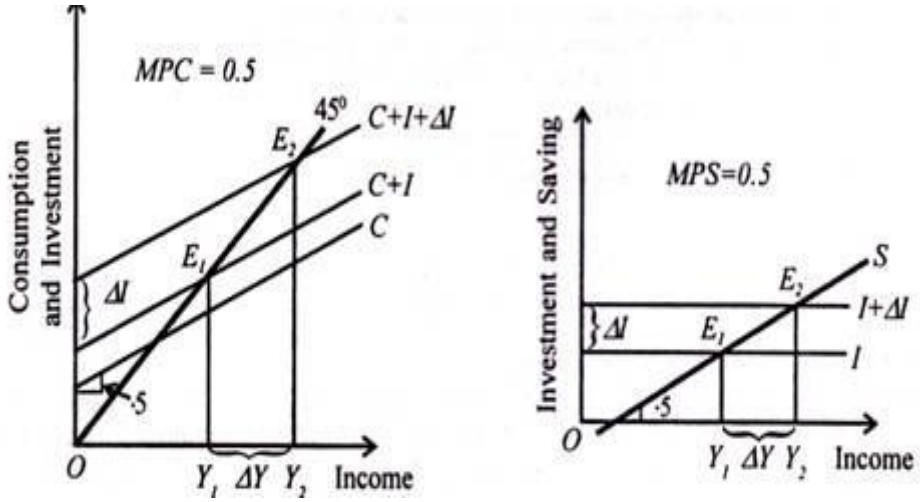

Fig.5.7.

This process of income propagation as a result of increase in investment is shown diagrammatically in Figure. The C curve has a slope of 0.5 to show the MPC equal to one-half. C + I is the investment curve which intersects the 45° line at E_1 so that the old equilibrium level of income is OY_1. Now there is an increase in investment of ΔI as shown by the distance between C + I and C + I + ΔI curves. This curve intersects the 45° line at E_2 to give OY_2 as the new income. Thus, the rise in income Y_1Y_2 as shown by ΔY is twice the distance between C + I and C + I + ΔI, since the MPC is one-half.

The same results can be obtained if MPS is taken so that when income increases, savings also increase to equal the new investment at a new equilibrium level of income. This is shown in Figure. S is the saving function with a slope of 0.5 to show MPS of one-half. I is the old investment curve which cuts S at E_1; so that OY_1 is the old equilibrium level of income. The increase in investment ΔI is superimposed on the ΔI curve in the shape of a new investment curve I + ΔI which is intersected by the S curve at E_2 to give OY_2 as the new equilibrium level of income. The rise in income Y_1-Y_2 (shown as ΔY) is exactly double the increase in investment ΔI, as the MPS is one-half.

Backward Operation:

The above analysis pertains to the forward operation of the multiplier. If, however, investment decreases, instead of increasing, the multiplier operates backward. A reduction in investment will lead to contraction of income and consumption which, in turn, will lead to cumulative decline in income and consumption till the contraction in aggregate income is the multiple of the initial decrease in investment.

Suppose investment decreases by Rs 100 crores. With an MPC = 0.5 and K=2, consumption expenditure would keep on declining till aggregate income is decreased by Rs 200 crores. In terms of multiplier formula, -ΔY = K (- ΔI), we get—200 = 2 (-100). The magnitude of contraction due to the backward operation of the multiplier depends on the value of MPC. The higher the MPC, the greater is the value of multiplier and the greater the cumulative decline in income, and vice versa. On the contrary, the higher the MPS, the lower is the value of the multiplier and the smaller the cumulative decline in income, and vice versa.

Thus, a community with a high propensity to consume (or low propensity to save) will be hurt more by the reverse operation of the multiplier than one with a low propensity to consume (or high propensity to save).

Diagrammatically, the reverse operation also can be explained in terms of Figures.5.7. Taking, when investment decreases, the investment function C + I + ΔI shifts downward to C + I. As a result, the equilibrium level also shifts from E_2 to E_1 to and income declines from OY_1 to OY_2. The MPC being 0.5, the fall in income Y_1Y_2 is exactly double the decline in investment as shown by the distance between C + I + ΔI and C + I. Similarly, in Figure 2 when investment falls, the investment function I + ΔI shifts downward as I curve and income decreases from OY_2 to OY_1. The MPS being 0.5, the decrease in income Y_2Y_1 is double the decline in investment as measured by the distance between I + ΔI and I curves.

Assumptions of Multiplier:

Keynes's theory of the multiplier works under certain assumptions which limit the operation of the multiplier. They are as follows:

(1) There is change in autonomous investment and that induced investment is absent.

(2) The marginal propensity to consume is constant.

(3) Consumption is a function of current income.

(4) There are no time lags in the multiplier process. An increase (decrease) in investment instantaneously leads to a multiple increase (decrease) in income.

(5) The new level of investment is maintained steadily for the completion of the multiplier process.

(6) There is net increase in investment.

(7) Consumer goods are available in response to effective demand for them.

(8) There is surplus capacity in consumer goods industries to meet the increased demand for consumer goods in response to a rise in income following increased investment.

(9) Other resources of production are also easily available within the economy.

(10) There is an industrialized economy in which the multiplier process operates.

(11) There is a closed economy unaffected by foreign influences.

(12) There are no changes in prices.

(13) The accelerator effect of consumption on investment is ignored.

(14) There is less than full employment level in the economy.

5.7. Leakages of Multiplier:

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

The following are the important leakages:

1. Saving:

Saving is the most important leakage of the multiplier process. Since the marginal propensity to consume is less than one, the whole increment in income is not spent on consumption. A part of it is saved which peters out of the income stream and the increase in income in the next round declines. Thus, the higher the marginal propensity to save, the smaller the size of the multiplier and the greater the amount of leakage out of the income stream, and vice versa. For instance, if MPS = 1/6, the multiplier is 6, according to the formula K = 1/MPS; and the MPS of 1/3 gives a multiplier of 3.

2. Strong Liquidity Preference:

If people prefer to hoard the increased income in the form of idle cash balances to satisfy a strong liquidity preference for the transaction, precautionary and speculative motives, that will act as a leakage out of the income stream. As income increases people will hoard money in inactive bank deposits and the multiplier process is checked.

3. Purchase of Old Stocks and Securities:

If a part of the increased income is used in buying old stocks and securities instead of consumer goods, the consumption expenditure will fall and its cumulative effect on income will be less than before. In other words, the size of the multiplier will fall with a fall in consumption expenditure when people buy old stocks and shares.

4. Debt Cancellation:

If a part of increased income is used to repay debts to banks, instead of

spending it for further consumption, that part of the income peters out of the income stream. In case, this part of the increased income is repaid to other creditors who save or hoard it, the multiplier process will be arrested.

5. Price Inflation:

When increased investment leads to price inflation, the multiplier effect of increased income may be dissipated on higher prices. A rise in the prices of consumption goods implies increased expenditure on them. As a result, increased income is absorbed by higher prices and the real consumption and income fall. Thus, price inflation is an important leakage which tends to dissipate increase in income and consumption on higher prices rather than in increasing output and employment.

6. Net Imports:

If increased income is spent on the purchase of imported goods it acts as a leakage out of the domestic income stream. Such expenditure fails to effect the consumption of domestic goods. This argument can be extended to net imports when there is an excess of imports over exports thereby causing a net outflow of funds to other countries.

7. Undistributed Profits:

If profits accruing to joint stock companies are not distributed to the shareholders in the form of dividend but are kept in the reserve fund, it is a leakage from the income stream. Undistributed profits with the companies tend to reduce the income and hence further expenditure on consumption goods thereby weakening the multiplier process.

8. Taxation:

Taxation policy is also an important factor in weakening the multiplier process. Progressive taxes have the effect of lowering the disposable income of the taxpayers and reducing their consumption expenditure. Similarly, commodity taxation tends to raise the prices of goods, and a part of increased income may be dissipated on higher prices. Thus, increased taxation reduces the income stream and lowers the size of the multiplier.

9. Excess Stocks of Consumption Goods:

If the increased demand for consumption goods is met from the existing excess stocks of consumption goods there will be no further increase in

output, employment and income and the multiplier process will come to a halt till the old stocks are exhausted.

10. Public Investment Programmes:

If the increase in income as a result of increased investment is affected by public expenditures, it may fail to induce private enterprise to spend that income for further investment due to the following reasons.

(a) Public investment programmes may raise the demand for labour and materials leading to a rise in the costs of construction so as to make the undertaking of some private projects unprofitable.

(b) Government borrowing may, if not accompanied by a sufficiently liberal credit policy on the part of the monetary authority, increase the rate of interest and thus discourage private investment.

(c) Government operations may also injure private investors' confidence by arousing animosity or fears of nationalization.

5.8. Importance of Multiplier:

The concept of multiplier is one of the important contributions of Keynes's to the income and employment theory. As aptly observed by Richard Goodwin "Lord Keynes did not discover the multiplier; that honour goes to Mr. R.F. Kahn. But he gave it the role it plays today by transforming it from an instrument for the analysis of road building into one for the analysis of income building.... It set a fresh wind blowing through the structure of economic thought."

Its importance lies in the following:

1. Investment:

The multiplier theory highlights the importance of investment in income and employment theory. Since the consumption function is stable during the short-run fluctuations in income and employment are due to fluctuations in the rate of investment. A fall in investment leads to a cumulative decline in income and employment by the multiplier process and vice versa. Thus, it underlines the importance of investment and explains the process of income propagation.

2. Trade Cycle:

As a corollary to the above, when there are fluctuations in the level of

income and employment due to variations in the rate of investment, the multiplier process throws a spotlight on the different phases of the trade cycle. When there is a fall in investment, income and employment decline in a cumulative manner leading to recession and ultimately to depression. On the contrary, an increase in investment leads to revival and, if this process continues, to a boom. Thus, the multiplier is regarded as an indispensable tool in trade cycles.

3. Saving-Investment Equality:

It also helps in bringing the equality between saving and investment. If there is a divergence between saving and investment, and increase in investment leads to a rise in income via the multiplier process by more than the increase in initial investment. As a result of the increase in income, saving also increases and equals investment.

4. Formulation of Economic Policies:

The multiplier is an important tool in the hands of modern states in formulating economic policies. Thus, this principle pre-supposes state intervention in economic affairs.

(a) To achieve full employment:

The state decides upon the amount of investment to be injected into the economy to remove unemployment and achieve full employment. An initial increase in investment leads to the rise in income and employment by the multiplier time the increase in investment. If a single dose of investment is insufficient to bring full employment, the state can inject regular doses of investment for this purpose till the full employment level is reached.

(b) To control trade cycles:

The state can control booms and depressions in a trade cycle on the basis of the multiplier effect on income and employment. When the economy is experiencing inflationary pressures, the state can control them by a reduction in investment which leads to a cumulative decline in income and employment via the multiplier process. On the other hand, in a deflationary situation, an increase in investment can help increase the level of income and employment through the multiplier process.

(c) Deficit financing:

The multiplier principle highlights the importance of deficit budgeting. In a state of depression, cheap money policy of lowering the rate of interest is not helpful because the marginal efficiency of capital is so low that a low rate of interest fails to encourage private investment. In such a situation, increased public expenditure through public investment programmes by creating a budget deficit helps in increasing income and employment by multiplier time the increase in investment.

(d) Public investment:

The above discussion reveals the importance of the multiplier in public investment policy. Public investment refers to the state expenditure on public works and other works meant to increase public welfare. It is autonomous and is free from profit motive. It, therefore, applies with greater force in overcoming inflationary and deflationary pressures in the economy, and in achieving and maintaining full employment. Private investment being induced by profit motive can help only when the public investment has created a favourable situation for the former. Moreover, economic activity cannot be left to the vagaries and uncertainties of private enterprise. Hence, the importance of multiplier in public investment lies in creating or controlling income and employment. The state can have the greatest multiplier effect on income and employment by increasing public investment during a depression where the MPC is high (or the MPS is low). On the contrary, in periods of overfull employment, a decline in investment will have a serious effect on the levels of income and employment where the MPS is high (or MPC is low). The best policy is to reduce investment where the MPC is low (or MPS is high), to have gradual decline in income and employment.

2. The Dynamic or Period Multiplier:

Keynes's logical theory of the multiplier is an instantaneous process without time lags. It is a timeless static equilibrium analysis in which the total effect of a change in investment on income is instantaneous so that consumption goods are produced simultaneously and consumption expenditure is also incurred instantaneously. But this is not borne out by facts because a time lag is always involved between the receipt of income and

its expenditure on consumption goods and also in producing consumption goods. Thus "the timeless multiplier analysis disregards the transition and deals only with the new equilibrium income level" and is, therefore, unrealistic. The dynamic multiplier relates to the time lags in the process of income generation. The series of adjustments in income and consumption may take months or even years for the multiplier process to complete, depending upon the assumption made about the period involved.

3. The Employment Multiplier:

The concept of Employment Multiplier was introduced by R.F. Kahn in 1931 as a ratio between the total increase in employment and primary employment, i.e. $K^1 = \Delta N/\Delta N_1$ where K^1 stands for the employment multiplier, ΔN_1 for the increase in total employment and ΔN_1 for the increase in primary employment.

Thus the "employment multiplier is a coefficient relating an increment of primary employment on public works to the resulting increment of total employment, primary and secondary combined." To illustrate it, suppose 200000 additional men are employed in public works so that the (secondary) employment is increased by 400000. The total employment is increased by 600000 (=200000 primary + 400000 secondary). The employment multiplier would be 600000/ 200000=3.

Algebraically, the Keynesian multiplier $\Delta Y = K\Delta I$ is analogous to Kahn's multiplier $\Delta N=K^1\Delta N_1$. But Keynes points out that there is no reason in general to suppose that $K = K^1$ because income in terms of wage units may rise more than employment, if in the process, nonwage earners' income should rise proportionately more than wage earners' income. Moreover, with decreasing returns, total product would rise proportionately less than employment. In short, income in terms of wage units would rise most, employment next and output the least. Still, according to Hansen, in the short-run, all three would tend to rise and fall together as envisaged by the Keynesian income and employment theory. He concludes that thus for practical purposes we do no great violence to the facts if we assume that the employment multiplier K^1 equals the investment multiplier K. If, however, output increases towards the full employment output, per unit of labour will fall due to decreasing

returns. In such a situation, K^1 is larger than K when the multiplier is working to increase output and employment. But K^1 is smaller than K if the multiplier is working in the opposite direction. Dillard points out the employment multiplier are useful for showing the relation between primary and secondary employment from public works. But Keynes' conception is superior to Kahn's because in the words of Goodwin, "He gave it the role it plays today by transforming it from an instrument for the analysis of road building into one for the analysis of income building."

5.9. Determinants of Money Supply:

Money forms the most important or key part of the financial superstructure of any economy. Hence its control becomes the basic ingredient in almost every macro-economic policy prescription. It is crucial for this purpose, to identify the main determinants of money supply. The focal point of this module is to provide a behavioral explanation for the changes in money supply in an economy. This requires a theoretical framework which is capable of analyzing the myriads of influences impinging on money supply arising from various sectors of the economy. This helps in identifying and anaysing the key determinants of money supply. The money multiplier theory, with its foundations in the works of Friedman and Schwartz (1963) and Cagan (1965) is one such framework. It tries to relate the stock of money M to the monetary base H and through the money multiplier m, to the public's preferences between currency, demand deposits and time deposits and to the bank's holding of reserves as a proportion of aggregate deposits/liabilities. Empirical validity and policy amenability of this theory makes the money multiplier framework our choice of study. The key problem of the Money multiplier Theory lies in the stability and predictability of the reserve money multiplier. This is essential to emphasize a stable and predictable relationship between the money stock and reserve money and to emphasize the superiority of the monetary base as an instrument of money stock control Vis a Vis interest rates.

5.10. MONEY MULTIPLIER FRAMEWORK:

The money multiplier framework postulates a relationship between ordinary M and high-powered money H where M is the money produced by

the RBI and the Government and held by the public in the form of currency C and Demand deposits DD. While High powered Money H is money produced by the RBI and the Government and held by the public in the form of currency C and by the banks in the form of reserves R. In the case of Broad Money M3 we will also include Time Deposits TD. Ignoring other deposits OD we have

$$M1 = C + DD \qquad M3 = C + DD + TD \qquad (1)$$

$$H = C + R \qquad H = CR \qquad (2)$$

If H is assumed to be policy determined, supply of H is given, Hs =H (3) Looking at the demand side Hd = Cd + Rd that is, Demand for H comes from the public for currency Cd and by the banks for reserves Rd.

$$Cd = c\ DD \qquad (4)$$

Looking at the components of Reserves into Required Reserves RR and excess reserves ER

$$R = RR + ER \qquad (5)$$

Dividing throughout by Total Deposits D we get the expression where reserve ratio (r) equals the required reserve ratio (r r) and excess reserve ratio (e)

$$r = r\ r + e \qquad (6)$$

The Total Reserves R are a certain proportion of Total Deposits D

$$Rd = r\ D \qquad (7)$$

The Total Deposits D are composed of Demand Deposits DD and Time Deposits TD

$$D = DD + TD \qquad (8)$$

$$TD = t\ DD \qquad (9)$$

With H = Hs, we have, $H = [c + (r\ r + e)\ (1 + t)]\ DD$

$M1 = (1+c)/[c+(r\ r + e)\ (1+ t)]\text{-}1\ H$ $M3 = (1+c+t)/[c+(r\ r +e)\ (1+t)]\text{-}1\ H$

These are the expressions for Narrow and Broad Money which helps us identify the various determinants of the narrow and broad money stock. Later in this module, we will derive the expression for Total Bank Credit and we will observe that the major determinants of both money supply and total bank credit are the same, namely, H, c, r r, e, t,

Substituting, we can derive the various multipliers

Demand deposit multiplier $=1/[c +(r\ r+e)\ (1+ t)]$

Total Deposit multiplier = (1 + t) /[c + (r r + e) (1 + t)]

Currency multiplier = c /[c +(r r + e) (1 + t)]

Narrow Money multiplier = (1+c) /[c +(r r +e) (1+ t)

Broad Money multiplier = (1 +c +t)/[c + (r r + e) (1 + t)]

These expressions tell us the amount by which, The Demand Deposits, Total Deposits, Total Currency, Narrow Money and Broad Money will increase when there is a certain increase in H in the economy.

Graphical Exposition of Equilibrium and Stability Analysis in The Money Multiplier Framework

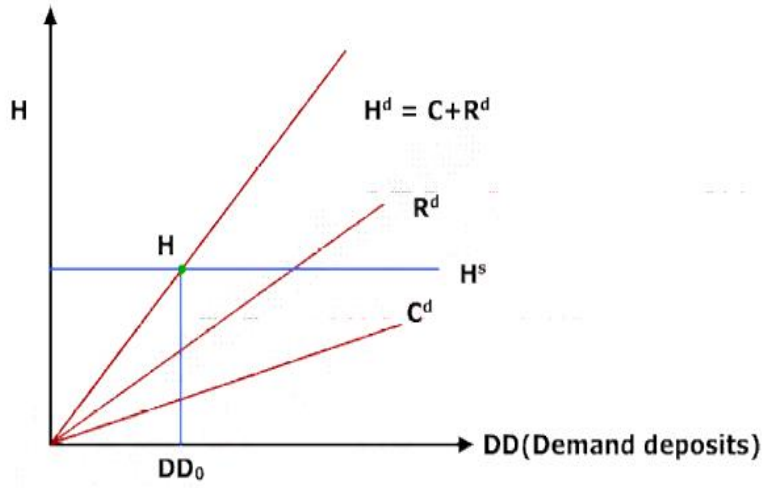

Fig.5.8.

The above diagram can be used to show the determination of money supply under the H Theory of Money Supply. H is measured on the vertical axis while Demand deposits DD on the Horizontal axis. The supply of H is given exogenously by the monetary authorities as parallel to the horizontal axis- perfectly inelastic to DD. The Cd curve has slope c, the Rd curve has slope r(1+t). The Hd curve is the vertical summation of Cd and Rd .The equilibrium of H market is where Hd and Hs curve intersect, giving equilibrium level of demand deposits DD0 and currency C0. The public holds C0 amount of currency and leaves the rest H – C0=R0 for the banks to hold, and is equal to Hd. Given the Cd function, C0 is the amount of currency the public would like to hold when DD=DD0. In the second diagram the equilibrium in the market for reserves is depicted with the consequent determination of the equilibrium amount of DD. The participants in this market are the monetary authority, the public and banks. The demand for reserves comes from banks

and is represented by the Rd curve. The supply of R to banks is jointly determined by the monetary authority and the public.

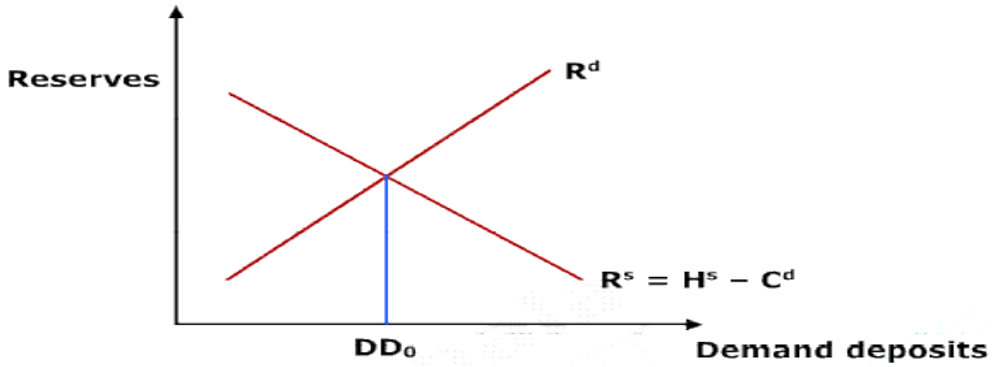

Fig.5.9.

The monetary authority fixes the total supply of H and then, the public decides how much of H is to be held as currency and how much is left for banks to serve as their reserves. In this the public has the 1st claim on H to meet their demand for currency because banks are always ready to convert their demand deposits into currency at par. Assuming actual C=Cd, banks have residual claims for reserves given by Rs =Hs-Cd and gives the downward sloping Rs curve. The intersection of Rd and Rs curve gives the equilibrium level of deposits DD0.This is the same in both the figures. The equilibrium amount of Money Supply can be inferred as M0= C0 + DD0. The crux of the above analysis is the role of secondary expansion of money supply via the production of DD. It also brings about the role of banks in the money supply changes, we could have a stability analysis to study the disequilibrium behavior too. Say if the public holds DD1amount of demand deposits which are less than the equilibrium number of deposits DD0.Here Cd, Rd and hence Hd will be lower than before and Hs remaining constant, there will be an excess supply of H in the H market and excess supply of R in the R market. Given that the excess reserves of a bank consist of desired excess reserves to meet their transaction, precautionary and speculative needs, these excess reserves are the undesired excess reserves, which do not earn any income for the bank, therefore the bank tries to get into earning assets. These earning assets can be of two types, Investment in marketable securities, whether government or private, or, secondly, Loans and advances. The implicit

assumption of the H Theory of Money Supply is that the supply of earning assets is highly elastic at the prevailing rate of interest, so the banks move into earning assets to use their undesired excess reserves very fast to restore equilibrium. In earlier years, in India, the securities market had not developed, so in times of depression, when the demand for Bank Loans would decline, they would be saddled with undesired excess reserves, However the situation now is one of excess demand rather than excess supply of loans, also, as a manager of public debt, the Reserve Bank of India has a perfectly elastic supply of government securities of different maturities which the banks can buy if the demand for loans slackens In terms of our earlier analysis, when banks have undesired excess reserves, and either lend or invest in securities, and the borrowers spend the funds received from the banks. The recipients of funds will keep a part of it in cash, rest in deposits with banks (both demand and Time Deposits) depending on the c ratio and the t ratio. There will be a consequent Increase in DD, Rd and Cd and a movement towards DD0 from DD1which continues till the banks exhaust their undesired excess reserves. The process of adjustment will be complete at DD0 level of deposits.

5.11. SUPER MULTIPLIER

Introduction:

T.N. Carver was the earliest economist who recognised the relationship between changes in consumption and net investment in 1903. But it was Aftalion who analysed this principle in detail in 1909. The term “acceleration principle” it was first introduced into economics by J. M. Clark in 1917. It was further developed by Hicks, Samuelson, and Harrod in relation to the business cycles.

1. The Principle of Acceleration:

The principle of acceleration is based on the fact that the demand for capital goods is derived from the demand for consumer goods which the former help to produce. The acceleration principle explains the process by which an increase (or decrease) in the demand for consumption goods leads to an increase (or decrease) in investment on capital goods. According to

Kurilara, “The accelerator coefficient is the ratio between induced investment and an initial change in consumption expenditure.”

Symbolically, $v = \Delta I/\Delta C$ or $\Delta I = v\ \Delta C$ where v is the accelerator coefficient, ΔI is net change in investment and AC is the net change in consumption expenditure. If the increase in consumption expenditure of Rs 10 crores leads to an increase in investment of Rs 30 crores, the accelerator coefficient is 3.

This version of the acceleration principle has been more broadly interpreted by Hicks as the ratio of induced investment to changes in output it calls forth. Thus, the accelerator v is equal to $\Delta l/\Delta Y$ or the capital- output ratio.

It depends on the relevant change in output (ΔT) and the change in investment (ΔI). It shows that the demand for capital goods is not derived from consumer goods alone but from any direct demand of national output. In an economy, the required stock of capital depends on the change in the demand for output. Any change in output will lead to a change in the capital stock. This change equals v times the change in output. Thus $\Delta I = v\Delta Y$, where v is the accelerator. If a machine has a value of Rs 4 crores and produces output worth Rs 1 crore, then the value of v is 4. An entrepreneur who wishes to increase his output by Rs 1 crores every year must invest Rs 4 crores on this machine. This equally applies to an economy where if the value of the accelerator is greater than one, more capital is required per unit of output so that the increase in net investment is greater than the increase in output that causes it. Gross investment in the economy will equal replacement investment plus net investment. Assuming replacement investment (i.e., replacement demand for machines due to obsolescence and depreciation) to be constant, gross investment will vary with the level of investment corresponding to each level of output.

The acceleration principle can be expressed in the form of the following equation:

$$I_{gt} = v\ (Y_t - Y_{t-1}) + R$$

$$= v\ \Delta Y_t + R$$

where I_{gt} is gross investment in period t, v is the accelerator, Y_t is the national output in period t, Y_{t-1} is the national output in the previous period (t—1), and R is the replacement investment.

The equation tells that gross investment during period t depends on the change in output (Y) from period t — 1 to period t multiplied by the accelerator (v) plus replacement investment R.

In order to arrive at net investment $(In)_t$ R must be deducted from both sides of the equation so that net investment in period t is

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

$= v\ \Delta Y_t$

If $Y_t > Y_{t-1}$ net investment is positive during period t. On the other hand, if $Y_t < Y_{t-1}$ net investment is negative or there is disinvestment in period t.

Operation of the Acceleration Principle:

The working of the acceleration principle is explained in Table I.

Table I: Operation of the Acceleration Principle : $v = 4$

Period in Years	*Total Output (Y)*	*Required Capital*	*Replacement Investment (R)*		*Net Investment (I_n)*		*Gross Investment (I_g)*
(1)	*(2)*	*(3)*	(4)	+	(5)	=	(6)
t	100	400	40		0		40
t+1	100	400	40		0		40
t+2	105	420	40		20		60
t+3	115	460	40		40		80
t+4	130	520	40		60		100
t+5	140	560	40		40		80
t+6	145	580	40		20		60
t+7	140	560	40		—20		20
t+8	130	520	40		—40		0
t+9	125	600	40		—20		20

The table traces changes in total output, capital stock, net investment and gross investment over ten time periods. Assuming the value of the acceleration v=4, the required capital stock in each period is 4 times the corresponding output of that period, as shown in column (3).

The replacement investment is assumed to be equal to 10 per cent of the capital stock in period t, shown as 40 in each time period. Net investment in column (5) equals v times the change in output between one period and the preceding period.

For example, net investment in period t+3=v $(y_{t+3} - Y_{t+2})$, or 40=4(115—105). It means that given the accelerator of 4, the increase of 10 in the demand for

final output leads to an increase of 40 in the demand for capital goods (machines). Accordingly, the total demand for capital goods (machines) rises to 80 made up of 40 of replacement and 40 of net investment. Thus, the table reveals that net investment depends on the change in total output, given the value of the accelerator. So long as the demand for final goods (output) rises net investment is positive. But when it falls net investment is negative. In the table, total output (column 2) increases at an increasing rate from period to t+4 and so does net investment (column 5). Then it increases at a diminishing rate from period t+5 to t+6 and net investment declines from period t+7 to t+9, total output falls, and net investment becomes negative.

The acceleration principle is illustrated diagrammatically in Figure 5.10. where in the upper portion, total output curve Y increases at an increasing rate up to t+4 period, then at a decreasing rate up to period t+6. After this it starts diminishing.

The curve I_n in the lower part of the figure shows that the rising output leads to increased net investment upto t+4 period because output is increasing at an increasing rate. But when output increases at decreasing rate between t+4 and t+6 periods, net investment declines.

When output starts declining in period t+7, net investment becomes negative. The curve I_g represents gross investment of the economy. Its behaviour is similar to the net investment curve.

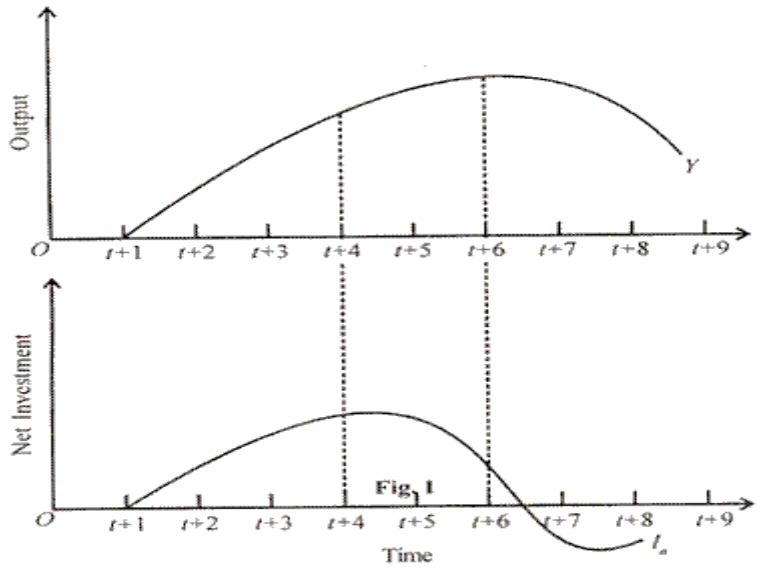

Fig.5.10.

But there is one difference that gross investment is not negative and once it becomes zero in period t+8, the curve I_g again starts rising. This is because despite net investment being negative, the replacement investment is taking place at a uniform rate.

Assumptions:

The acceleration principle is based upon the following assumptions:

1. The acceleration principle assumes a constant capital-output ratio.
2. It assumes that resources are easily available.
3. It assumes that there is no excess or idle capacity in plants.
4. It is assumed that the increased demand is permanent.
5. It also assumes that there is elastic supply of credit and capital.
6. It further assumes that an increase in output immediately leads to a rise in net investment.

Criticisms:

The acceleration principle has been criticised by economists for its rigid assumptions which tend to limit its smooth working.

The following are its limitations:

1. Capital-Output Ratio not Constant:

The acceleration principle is based on a constant capital-output ratio. But this ratio does not remain constant in the modern dynamic world. Inventions and improvements in techniques of production are constantly taking place which lead to increase in output per unit of capital. Or, existing capital equipment may be worked more intensively. Moreover, change in the expectations of businessmen with regard to prices, wages, interest may affect future demand and vary the capital-output ratio. Thus, the capital-output ratio does not remain constant but changes in the different phases of the trade cycle.

2. Resources not Elastic:

The acceleration principle assumes that the resources should be elastic so that they are employed in the capital goods industries to enable them to expand. This is possible when there is unemployment in the economy.

But once the economy reaches the full employment level, the capital goods

industries fail to expand due to the non-availability of sufficient resources. This limits the working of the acceleration principle. So, this principle will not apply in a recession where excess capacity is found.

3. Idle Capacity in Plants:

The acceleration theory assumes that there is no unused (or idle) capacity in plants. But if some machines are not working to their full capacity and are lying idle, then an increase in the demand for consumer goods will not lead to the increased demand for new capital goods. In such a situation the acceleration principle will not work.

4. Difference between Required and Real Capital Stock:

It assumes no difference between required and real capital stock. Even if it exists, it ends in one period. But if industries are already producing capital goods at full capacity, it is not possible to end the difference in one period.

5. Does not explain Timing of Investment:

The assumption of the existence of full capacity implies that increased demand for output immediately leads to induced investment. The acceleration principle, therefore, fails to explain the timing of investment. At best it explains the volume of investment. As a matter of fact, there may be a time lag before new investment can be generated. For instance, if the time lag is four years, the effect of new investment will not be felt in one year but in four years.

6. Does not consider Availability and Cost of Capital Goods:

The timing of the acquisition of capital goods depends on their availability and cost, and the availability and cost of financing them. The theory does not consider these factors.

7. Acceleration Effect Zero for Installed Equipment:

It is assumed that no increase in demand for consumer-goods has been foreseen and provided for in previous capital investment. If by anticipating future demand, capital equipment has already been installed, it would not lead to induced investment and the acceleration effect will be zero.

8. Neglects the Role of Expectations:

The acceleration principle neglects the role of expectations in decision-making on the part of entrepreneurs. The investment decisions are not

influenced by demand alone. They are also affected by future anticipations like stock market changes, political developments, international events, economic climate, etc.

9. Neglects the Role of Technological Factors:

The acceleration principle is weak in that it neglects the role of technological factors in investment. Technological changes may be either capital-saving or labour- saving. They may, therefore, reduce or increase the volume of investment. Further, as pointed out by Professor Knox, "capital equipment may be bulky and the employment of additional plant is justified only when output has risen considerably. This factor is all the more important because usually what is added is a complex of machines and not a machine."

Conclusion:

Despite these limitations, the principle of acceleration makes the process of income propagation clearer and more realistic than the multiplier theory. The multiplier shows the effect of a change in investment on income via consumption while the acceleration shows the effect of consumption or output on investment and income. Thus the acceleration explains volatile fluctuations in income and employment as a result of fluctuations in capital goods industries. But it can explain upper turning points better than lower turning points.

2. The Super-Multiplier or the Multiplier-Accelerator Interaction:

In order to measure the total effect of initial investment on income, Hicks has combined the multiplier and the accelerator mathematically and given it the name of the super-multiplier. The combined effect of the multiplier and the accelerator is also called the leverage effect which may lead the economy to very high or low level of income propagation. The super-multiplier is worked out by combining both induced consumption (cY or $\Delta C/\Delta Y$ or MPC) and induced investment (vY or $\Delta I/\Delta Y$ or MPI). Hicks divides the investment component into autonomous investment and induced investment so that investment $I = I_d + vY$, where I_a is autonomous investment and vY is induced investment.

Since $Y = C + I$

Therefore,
$$\Delta Y = c\,\Delta Y + \Delta Ia + v\Delta Y$$
$$\Delta Y - c\Delta Y - v\Delta Y = \Delta Ia$$
$$\Delta Y\,(1-c-v) = \Delta Ia$$
$$\frac{\Delta Y}{\Delta I_a} = \frac{1}{1-c-v} = \frac{1}{s-v}$$

or
$$K_S = \frac{1}{1-c-v} = \frac{1}{s-v}$$

Where K_s is the super-multiplier, c is the marginal propensity to consume, v the marginal propensity to invest, and S is the marginal propensity to save (s=1- c). The super-multiplier tells us that if there is an initial increase in autonomous investment, income will increase by K_s times the autonomous investment.

$$\Delta Y = \frac{1}{1-c-v}\Delta Ia$$
$$= K_S\,\Delta\, Ia$$

Let us explain the combined operation of the multiplier and the accelerator in terms of the above equation. Suppose c = 0.5, v = 0.4 and autonomous investment increases by Rs. 100 crores. The increase in aggregate income will be

$$\Delta Y = \frac{1}{1-0.5-0.4} \times 100$$
$$= \frac{1}{0.1} \times 100 = 10 \times 100 = 1000$$

It shows that a rise in autonomous investment by Rs 100 crores has raised income to Rs. 1000 crores. The simple multiplier would have raised income to only Rs. 200 crores, given the value of K the multiplier as 2 (since MPC = 0.5). But the multiplier combined with the accelerator (Ks = 10) has raised income to Rs. 1000 crores which is higher than generated by the simple multiplier.

Table II explains how the process of income propagation via the multiplier and the accelerator with the value of the super-multiplier K_s = 10 leads to a rise in income to Rs. 1000 crores with an initial investment of Rs. 100 crores.

Table II : Multiplier-Accelerator Interaction

(Rs Crores)

Period (t)	Initial Investment	Induced Comsumption (c=0.5)	Induced Investment (v=0.4)	Increase in Income (ΔY=c+v)	Total Increase in Income
(1)	(2)	(3)	(4)	(5)	(6)
t+0	0	0	0	0	0
t+1	100	—	—	100	100
t+2	100	50	40	90	190
t+3	100	45	36	81	271
t+4	100	40.5	32.4	72.9	343.9
t+5	100	36.45	29.16	65.61	409.51
....	....	....	...	...	...
t+*n*	100	0	0	0	1000

In period t+1 constant investment of 100 is injected into the economy but there is no immediate induced consumption or investment. In period t+2, induced consumption of 50 takes place out of the income 100 of period t+1, since the marginal propensity to consume is 0.5, while there is an induced investment of 40 out of 100 income (v being 0.4).

The increase in income from period 1 to 2 is (50+40) = 90. The increase in income in different periods can be calculated as $\Delta Y_{t+2} = c \Delta Y_{t+1} + v\Delta Y_{t+1}$ = 0.5x 100 + 0.4x 100 = 90. Similarly, the increase in income in period t+3 can be calculated as $\Delta Y_{t+3} = c\Delta Y_{t+2} + v \Delta Y_{t+2}$ = 0.5×90+0.4×90=45+36=81.

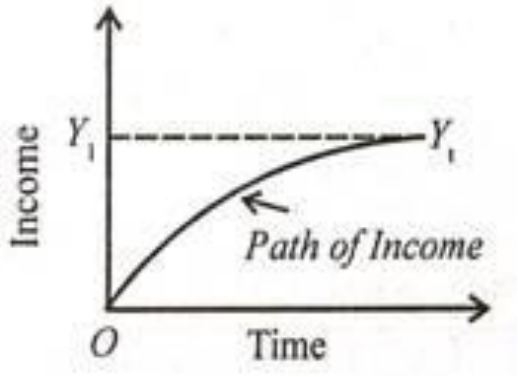

Fig.5.11.

The total increase in income (column 6) is arrived at by adding the increase in income (column 5) of the current period to the total increase in income

(column 6) of the previous period. For instance, the total increase in income (column 6) in period t + 2 of 190 is arrived at by adding the increase in income (column 5) of this period to the total increase in income 100 (of column 6) of the previous period t+1. Similarly, the total increase in income in period t+3 of 271 = increase in income of 81 in this period plus 190 of column 6 of period t+2. This cumulative process of income propagation continues till in period t + n, induced consumption, induced investment and increase in income dwindle to Zero. If we add up the increase in consumption, investment and income from period t+1 to t+n, the total income increases to Rs 1000 crores, total consumption to Rs 500 crores and total investment to Rs 400 crores, given the initial investment of Rs 100 crores. The dynamic path of income is shown in the adjoining Fig.11. Income is measured vertically and time horizontally. The curve OY_1 shows the time path of income with a super-multiplier of 10. The curve rises with time and reaches the new equilibrium level of income Y_1 and flattens out. It indicates that income increases at a decreasing rate.

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