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ECONOMICS

BLOCK 1

KRISHNA KANTA HANDIQUI STATE OPEN UNIVERSITY

Subject Expert

Professor Madhurjya Prasad Bezbaruah, Dept. of Economics, Gauhati University

Professor Nissar Ahmed Barua, Dept. of Economics, Gauhati University

Dr. Gautam Mazumdar, Dept. of Economics, Cotton University

Course Co-ordinator : **Bhaskar Sarmah,** Ph.D., KKHSOU

SLM Preparation Team

Units	Contributors
1	**Gbenga Emmanuel Afolayan,** The Federal Polytechnic Ilaro, Nigeria.
2	**Dr. Parag Dutta,** Dispur College.
3, 4	**Dr. Ruby Sarma,** Rangia College.
5	**Dr. Gopal Kumar Sharma,** Baosi Bani kanta Kakati College, Barpeta.
6	**Dr. Archana Mali,** Dakshin Kamrup College, Mirza.
7	**Dr. Surendra Jadhav,** Chetana's H. S. College of Commerce & Economics. Mumbai

Editorial Team

Content : **Dr. Gautam Mazumdar,** Department of Economics, Cotton University

Structure, Format & Graphics : **Bhaskar Sarmah,** Ph.D. KKHSOU

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Head Office : Patgaon, Rani Gate, Guwahati-781017
City Office : Housefed Complex, Dispur, Guwahati-781 006; Web: www.kkhsou.in

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COURSE INTRODUCTION

As a learner in Economics, you have already gathered the basic concepts on Economics in your Undergraduate study. You have also come across a few important concepts in Micro, Macro and other branches in Economics. This course shall introduce you to some of the important theories in the field of Macroeconomics.

This is the second course of the First Semester of the MA programme in Economics. This course has been entitled 'Macroeconomics-I'. This course contains a total of fourteen units and has been divided into two blocks. Both the block contain 7 units each. This course shall introduce you to some of the basic theories in Economics, and hence is very important for the overall understanding of the discipline. Please note that in the second also, we shall discuss a few concepts of Macroeconomics in the course entitled Macroeconomics-II.

BLOCK INTRODUCTION

The *first unit* of the course entitled 'Macroeconomics I' will present you the basic concepts in national income accounting. In this unit, the concepts of domestic and national income, a few related totals, viz., GDP, NDP, GNP, NNP at factor cost and market price as well as personal income and disposable personal income have been discussed. The *second unit* is a continuation of the first unit. In this unit, important concepts like circular flow of income in two, three- and four-sector economy have been discussed. Similarly, different forms of national income accounting, viz., social accounting, input-output accounting, flow of funds accounting and balance of payments accounting have been discussed. The *third unit* of the course, entitled Classical Theory of National Income Determination, will be helpful in reviewing your study with respect to the famous Say's law of market. The unit shall also deliberate on the classical theory of employment and income and Keynes' objections to that. The *fourth unit* of the course discusses the Keynesian theory of national income determination. In this unit, along with Keynes' theory of income determination, hisdeparture from classical theory, the basic Keynesian framework and the relevance for developing countries have been discussed. The *next unit* of the block has been entitled Consumption Function. In this unit, Keynes' psychological law of consumption, its implications, empirical evidence on consumption function have been discussed. The *sixth unit* of the block shall introduce you to some of the important theories of consumption function, viz., the absolute income, relative income, life cycle and permanent income hypotheses. The *last unit* of the block is on investment

function. In this unit, a few important concepts in Macroeconomics, viz., marginal efficiency of investment and level of investment,marginal efficiency of capital and investment: long run and short run, factors affecting MEC and MEI and different types of investment have been discussed.

While going through a unit, you will notice some along-side boxes, which have been included to help you know some of the difficult, unseen terms. Some "ACTIVITY' (s) have been included to help you apply your own thoughts. Again, we have included some relevant concepts in "LET US KNOW" along with the text. And, at the end of each section, you will get "CHECK YOUR PROGRESS" questions. These have been designed to self-check your progress of study. It will be better if you solve the problems put in these boxes immediately after you go through the sections of the units and then match your answers with "ANSWERS TO CHECK YOUR PROGRESS" given at the end of each unit.

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UNIT 1: NATIONAL INCOME AND RELATED TOTALS

UNIT STRUCTURE

1.1 Learning Objectives

1.2 Introduction

1.3 National Income

1.3.1 Concepts of Domestic and National Income

1.3.2 Related Totals: GDP, NDP, GNP, NNP and Factor Cost at Market Price, Personal Income, Disposable Personal Income

1.4 Relationship between National Income and Personal Income

1.5 Let Us Sum Up

1.6 Further Reading

1.7 Answers to Check Your Progress

1.8 Model Questions

1.1 LEARNING OBJECTIVES

After going through this unit, you will be able to-

- clearly define and explain the concepts of domestic and national income
- discuss various related totals to national income
- derive the relationships among different related totals of national income.

1.2. INTRODUCTION

National income is one of the most important concepts in all economic system. It contains consistent estimates of significant aggregates and components for the economy and for major economic sectors, or groupings of decision-making units. It should be noted that macroeconomics deals with economic and physiological forces (aggregate employment, production, real income and the price level). However, national income is a crucial

preparatory parameter for tackling macroeconomic issues of unemployment, inflation, growth and 'economic welfare' (quality of life). Thus, national income, together with its related totals, is important for decision-makers in our economy to shed light on the country's macroeconomic performance, and to forecast events in the future. In this unit, we shall try to look at the definitions and conceptual framings of domestic and national income. We shall also discuss various related totals of national income that are used to determine the progress of the economy.

1.3 DOMESTIC AND NATIONAL INCOME

As stated earlier, national income serves as a background for economic appraisals and projections, and it also makes possible more effective public and private decision-making. It attempts to measure how much economic activity took place during a specified period of time (usually a year). However, income of a country may be stated in the context of its 'territory' and its 'normal residents'. In this section, we attempt to state the definitions of domestic and national income, and also try to derive conceptual explanations underpinning them.

1.3.1 Concepts of Domestic and National Income

We have already stated that income of a country may be explained from two perspectives: its domestic territory and its normal residents. Here, the contrast is important. As we shall see later, the difference between the two is an important macroeconomic discourse for national income. Domestic income can be defined as the sum total of factor incomes generated by all the production units located within domestic territory of a country during an accounting period-usually a year. We should note that factor incomes are expected to be generated within a defined territory irrespective of the statuses of the producers (citizens or foreigners).

Within a defined territory, it is expected that both nationals and non-nationals reside. By implication, domestic income includes factor incomes of both nationals and non-nationals residing within a particular domestic territory. For instance, there are many foreign companies and banks which operate within domestic (economic) territory of India. Income generated by these foreign companies and banks are included in India's domestic income. Therefore, the conceptualisation of domestic income is territorial in nature since it is defined with particular reference to domestic territory. We should clearly note that domestic income excludes factor income earned abroad.

Whereas national income is simply defined as the sum total of factor incomes earned by normal residents of a country in a particular accounting period. It is important to note here that national income contains factor incomes earned by normal residents within and outside the country. National income is therefore framed along the lines of productive efforts of normal residents.

Overall, income generated by both citizens (residents) and foreigners (non-residents) within domestic territory of a country is referred to as domestic income while income generated by citizens (normal residents) within and outside a particular country is referred to as national income. The major difference between the two is the ***net factor income*** from abroad which is added to domestic income to get national income (i.e. National income = Domestic income plus Net factor income from abroad).



LET US KNOW

A resident is said to be a person (or institution) who ordinarily resides in a country and whose centre of economic interest lies in that country. He is called a normal resident since he normally lives in the country of his economic interest. The period of stay should be at least one year or more.



Net factor income: Net factor income is the difference between the aggregate amount that a particular country's citizens and companies earned abroad, and the aggregate amount that foreign citizens and overseas companies earn in that country.

Here, centre of economic interest implies two things: (a) the resident lives or is located within the domestic territory; and (b) the resident carries out basic economic activities of earnings, spending and accumulation from that location.

Following are not included under the category of normal residents: (a) foreign tourists and visitors who visit a country for recreation, holidays, medical treatment, study, sports, conferences, etc.; (b) foreign staff of embassies, officials, diplomats and members of the armed forces of a foreign country, located in the given country; (c) international organizations like UNO, WHO, etc. are not considered as normal residents of the country in which they operate. They are treated as the normal residents of international area; (d) employees of international organizations are considered as residents of the countries to which they belong and not of the international area. For example, an American working in UNO office located in India will be treated as normal resident of America. However, if the employees are working for more than one year in such International Institutions, then they become the normal resident a country in which such institutions are located. It means, in the given example, if the American is working in UNO office in India for more than one year, then he will be treated as normal resident of India; (e) crew members of foreign vessels, commercial travellers and seasonal workers, provided their stay is less than one year; (f) border workers who live near the international border and cross the border on a regular basis to work in the other country. They are treated as normal residents of the country where they live, and not where they work.

In laymen's terms, domestic territory means the political frontiers of a country. In Economics the term has a wider connotation. However, for the purpose of national income accounting, it is used in a wider sense.

In addition to political frontiers, domestic territory also includes: (a) ships and aircrafts owned and operated by normal

residents between two or more countries. For example, planes operated by Air India between Russia and Japan are part of the domestic territory of India. Similarly, planes operated by Singapore Airways between India and Japan are a part of the domestic territory of Singapore. (b) fishing vessels, oil and natural gas rigs and floating platforms operated by the residents of a country in the international waters where they have exclusive rights of operation. For example, fishing boats operated by Indian fishermen in international waters of Indian Ocean will be considered a part of domestic territory of India. (c) embassies, consulates and military establishments of a country located abroad. For example, Indian Embassy in Russia is a part of the domestic territory of India. Consulate is an office or building used by consul (an officer commissioned by the government to reside in a foreign country to promote the interest of the country to which he belongs).

Domestic Territory does not include: (a) embassies, consulates and military establishments of a foreign country. For example, Japanese Embassy in India is a part of domestic territory of Japan. (b) international organizations like UNO, WHO, etc. located within the geographical boundaries of a country. According to the United Nations, Economic Territory or domestic territory is the geographical territory, administered by a government within which, persons, goods and capital circulate freely.



CHECK YOUR PROGRESS

Q 1: Briefly explain how income can be explained in terms of 'domestic' and 'national'. Answer in about 20 words.

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Q 2: What is the difference between domestic and national income? Answer in about 20 words.

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1.3.2 Related Totals

In following the discussion of domestic and national income, we get a picture of some related totals and techniques economists use to measure the progress the economy. We discuss them one by one.

GDP (Gross Domestic Product): GDP is the total value of all the final goods and services produced within the domestic territory of a country during a period of time (usually a year). It is one of the fundamental indicators used to determine the health of a country's economy. Usually, GDP is used as a comparison to the previous year. For instance, if the year-to-year GDP is up 4 percent, this suggests that the economy has grown by 4 percent over the last year. Basically, GDP represents economic production and growth and this has a large impact on nearly everyone within that economy. An important change in GDP, whether up or down, often has a significant implication on the ***stock market***. This suggests why it is not so hard to understand why a bad economy usually means lower profits for companies, which in turn means lower stock prices and negative GDP growth.

NDP (Net Domestic Product): It is a measure of the economic output of a country that accounts for depreciation. It is calculated by subtracting depreciation from GDP. In general, NDP accounts for capital that has been consumed over the year in the form of housing, vehicle or machinery deterioration. The depreciation accounted for is what economists refer to as ***capital consumption allowance.***

GNP (Gross National Product): GNP is the value of al finished goods and services produced in a country during a period of time



Stock market: Stock market is a market where shares of publicly-held companies are issued and traded either through exchanges or over the counter markets.



Capital consumption allowance: Capital consumption allowance represents the amount needed in order to replace depreciated assets.

by her nationals. Both GDP and GNP try to measure the value of all goods and services produced for final sale in a particular economy. However, the difference revolves around how each term interprets what constitutes the economy. While GDP measures the domestic levels of production, GNP measures the levels of production of any person or corporation of a country. Depending on circumstances of each country, GNP can be either higher or lower than GDP. This depends on the net factor income from abroad.

GNP comprises income earned by nationals and companies abroad, but does not include income earned by foreigners within the country. The figures used to assess GNP include the manufacturing of tangible products (e.g. cars, furniture and agricultural products). GNP does not consider the services used to produce manufactured products because their value is already included in the price of the finished product. However, depreciation and indirect taxes such as sales tax are included in GNP. Mathematically, GNP is: Private Consumption + Government Expenditures + Private Investments + Exports - Imports + Inflow of factor income from abroad - Outflow of factor income to abroad = Gross National Product.

NNP (Net National Product) at factor cost and at market price: NNP is the net value of the goods and services produced by a country's nationals, whether overseas or resident, in the period being measured minus the amount of GNP required to purchase new goods to maintain existing depreciation (i.e. NNP = GNP - Depreciation). It should be noted that NNP is expressed in the currency of the nation it represents. In India, the NNP would be expressed as an Indian rupee, whereas it would be expressed in Euro for EU member nations, such as the Netherlands.

By definitional implication, NNP measures net output available for consumption and investment by consumers, producers and government. That suggests that NNP is the same as the national income at factor cost. Products are sold at market prices which

include the indirect taxes imposed by the government. For example, indirect taxes are levied on commodities such as GST on Packaged food and cloth and so on. As a result, the market value of the national product exceeds the income paid to the factors of production by the amount of indirect taxes. At the same time some products are subsidised which are sold below their production cost. Accordingly, the market price of these products is less than their factor cost. Because of these a difference arises between NNP at market price and NNP at factor cost. We may express NNP at market price as follows. NNP at market price = NNP at factor cost - Indirect Tax + Subsidies. In India and majority of the countries, it is the NNP at market price that is taken as the National Income of the country.

Personal Income: Personal income can be simply defined as the individual's total earnings from salaries, wages and bonuses received from employment or self-employment during a given period. Personal income determines the consumer consumption since it serves as an indicator of future demand for both goods and services in the market. (Relationship between personal income and national income will be discussed in the next section).

Disposable personal Income: Disposable personal income (DPI) is the total amount of money available for an individual to spend or save after taxes have been paid. DPI is different from personal income in that the former takes taxes into account. It should be noted that only income taxes are deducted from the personal income figure when calculating DPI.

1.4 RELATIONSHIP BETWEEN NATIONAL INCOME AND PERSONAL INCOME

The relationships between national income and personal income can be summarily discussed with the help of Figure 1.1.

Figure 1.1: Relationship between Different Aggregates of National Income^

					(j) All types of transfer incomes***	(j)
				(i) Net factor income from abroad	(i)	(i)
Income from domestic product accruing to	Govt. Sector	(h) Income of Govt. Sector**		(h)	x	x
	Private Sector	Profit of a company	(g) Undistributed Profit	(g)	(g)	x
			(f) Dividend	(f)	(f)	(f)
			(e) Profit Tax	(e)	(e)	x
		(d) Mixed income*		(d)	(d)	(d)
		(c) Interest		(c)	(c)	(c)
		(b) Wages		(b)	(b)	(b)
		(a) Rent		(a)	(a)	(a)
		Domestic Income		National Income	Private Income	Personal Income

^Source: https://www.zigya.com/study/? class=12&board=hbse&subject= Economics&book=Introductory+Macroeconomics&chapter=National+Income +Accounting&q_type=&q_topic=&q_category=&question_id=ECEN12051593

* Mixed income is the surplus or deficit accruing from production by unincorporated enterprises owned by households; it implicitly contains an element of remuneration for work done by the owner, or other members of the household, that cannot be separately identified from the return to the owner as entrepreneur but it excludes the operating surplus coming from owner-occupied dwellings.

(Source: https://stats.oecd.org/glossary/detail.asp?ID=1668)

** When showed separately of private sector.

*** Main forms of transfer income are: (i) interest on national debt, (ii) current transfers from government administrative departments, and (iii) net current transfers from rest of the world.

Now let us summarise the Table.

- Domestic Income = Rent (+) Wages (+) Interest (+) Mixed income (+) Profit Tax (+) Dividend (+) Undistributed Profit (+) Surplus of Govt. Sector (when showed separately of private sector).

Or

- Domestic income = Compensation of employees (+) Operating Surplus (+) Mixed Income.
- National Income = Domestic Income (+) Net Factor income from abroad.
- Private Income = National income (-) Surplus of government sector (+) All types of transfer incomes including national debt interest.
- Personal income = National income (-) surplus of government sector (-) corporate tax (-) undistributed profit (+) All type of transfer income including national debt interest.

Or

- Personal income = Private income (-) corporate tax (-) undistributed profit.
- Personal disposable income = personal income (-) personal taxes (including miscellaneous receipt of government).

Or

- Personal disposable income = National income (-) surplus of Government sector (-) Corporate tax (-) Undistributed profit (+) All type of transfer income (-) personal taxes.

- Private income = Income from domestic product accruing to private sector (+) Net factor from abroad (+) All types of transfer income including national debt interests.



CHECK YOUR PROGRESS

Q 3: What is meant by GNP? Answer in about 20 words.

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Q 4: What is meant by NNP and factor cost and at market price? Answer in about 60 words.

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Q 5: Distinguish between personal income and disposable income. Answer in about 60 words.

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1.5 LET US SUM UP

- Domestic income is the sum total of factor incomes generated by all the production units located within domestic territory of a country during an accounting period-usually a year

- National is the sum total of factor incomes earned by normal residents of a country in a particular accounting period.
- The difference between domestic and national income is the net factor income from abroad which is added to domestic income to get national income
- GDP is the total value of final goods and services produced in a country during a period of time (usually a year)
- NDP is a measure of the economic output of a country that accounts for depreciation
- GNP is the value of al finished goods and services produced in a country during a period of time by her nationals
- NNP is the net value of the goods and services produced by a country's nationals, whether overseas or resident, in the period being measured minus the amount of GNP required to purchase new goods to maintain existing depreciation
- Personal income is the individual's total earnings from salaries, wages , pensions and bonuses received from employment or self-employment during a given period
- Disposable personal income (DPI) is the total amount of money available for an individual to spend or save after taxes have been paid



1.6 FURTHER READING

1) Ajuja, H. L. (2007). Macroeconomics: Theory and Policy. New Delhi: S.Chand & Co.
2) Baunmol, W. J. and Alan, S. B. (2006). Macroeconomics: Principles and Policy. New Delhi: Cengage Learning.
3) Jhingan, M. L. (2003). Macro-economic Theory. New Delhi: Vinda Publications Limited.



1.7 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: We can explain income from two perspectives. It may be explained from the context of the domestic territory and normal residents of a country.

Ans to Q No 2: The major difference between the two is the net factor income from abroad which is added to domestic income to get national income.

Ans to Q No 3: GNP is the value of al finished goods and services produced in a country during a period of time by her nationals.

Ans to Q No 4: NNP is the net value of the goods and services produced by a country's nationals, whether overseas or resident, in the period being measured minus the amount of GNP required to purchase new goods to maintain existing depreciation. National income at factor cost (also known as net national income) shows the income actually received by the factors of production.

Ans to Q No 5: Personal income can be simply defined as the individual's total earnings from salaries, wages and bonuses received from employment or self-employment during a given period. Disposable personal income (DPI) is the total amount of money available for an individual to spend or save after taxes have been paid. DPI is different from personal income in that the former takes taxes into account.



1.8 MODEL QUESTIONS

A) Short Questions (Answer each question in about 100 words)

Q 1: Make a comparative analysis between domestic income and national income

Q 2: Write short note on NNP at factor cost and at market price

B) Essay-type Questions (Answer each question in about 400-500 words)

Q 1: Critically discuss the following terms: GDP and NDP.

Q 2: Write an essay on personal income and disposable personal income, using yourself as an example.

*** **** ***

UNIT 2: NATIONAL INCOME AND RELATED ACCOUNTS

UNIT STRUCTURE

2.1 Learning Objectives

2.2 Introduction

2.3 Circular Flow of Income in two, three and four sector economy

- 2.3.1 Circular Flow in Three Sector Model
- 2.3.1 Circular Flow in Four Sector Model

2.4 Different forms of National Income Accounting

- 2.4.1 Social Accounting
- 2.4.2 Input-output Accounting
- 2.4.3 Flow of fund Accounting
- 2.4.4 Balance of Payment Accounting

2.5 Let Us Sum Up

2.6 Further Reading

2.7 Answers to Check Your Progress

2.8 Model Questions

2.1 LEARNING OBJECTIVES

After going through this unit, you will be able to-

- show diagrammatically circular flow of income
- discuss the different forms of national income accounting
- explain the role and concept of social accounting
- describe the concept and use of input output accounting
- explain the concept of flow of fund accounting
- elaborate the concept of balance of payment accounting.

2.2. INTRODUCTION

The circular flow of income is a concept for better understanding of the economy as a whole. The circular flow of income or circular flow depicts exchanges between economic agents by flows of money, goods as well as services etc.

The National Income accounting refers to the bookkeeping system used by the government to measure the level of the country's economic activity during a given time period. It measures the revenue earned from various sources and expenditure incurred on various activities. There are three approaches to national income accounting. These are: value added approach, expenditure approach and income approach.

Social accounting includes all organizational activities that deal with the measurement and analysis of the social performance and the reporting of results of organization of concerned groups.

Input-output accounting is a form of macro-economic analysis based on the interdependencies between economic sectors or industries. This method is commonly used for estimating the impacts of positive or negative economic shocks and analyzing the ripple effects throughout an economy.

The flow of funds accounts of an economy gives information about the financial transactions among different sectors of the economy. It contains the sources of all funds received and the uses to which they are put within the economy. The flow of fund account acts as a link between saving and investment aggregates with lending and borrowing by different economic agents.

The balance of payments account of a country is a systematic record of all its economic transactions with the outside world in a given year. It is a statistical record of the character and dimensions of the country's economic relationships with the rest of the world.

2.3 CIRCULAR FLOW OF INCOME

As mentioned in the introductory chapter, circular flow of income is a model in which the major exchanges among economic agents are represented in terms of flows of money, goods and services etc. The circular flow of income is a macro-economic concept for better understanding of the economy as a whole. The circular flow of income in its most basic form considers a simple economy consisting of labourers and producers. In this simple economy, individuals provide the labour that enables producer to

produce goods and services. The circular flow illustrates the interdependence of the flows or activities that occur in the economy, such as the production of goods and services of the economy and the income generated from that production. It is generally observed that in a two sector economy, producers provide individuals with income in exchange for their labour. Income earned by the labourers is spent on the goods and services produced by the respective producers. The circular flow also depicts the equality between the income earned from production and the value of goods and services produced. An economy involves interactions between not only individuals and businesses, but also central, state, and local governments and residents of the rest of the world. Circular flow also embraces other aspects of economic activity such as investment in capital, flows of financial capital, and the contributions of these flows to the accumulation of fixed assets. Circular flow of income can be explained in terms of two sectors, three sectors and four sectors respectively.

In a two sector model, we have Business Sector (producing sector), and the Household Sector (consuming sector). Household Sector provides labour services for which they are paid by the Business Sector; the Household Sector then spends the money received as income in buying goods and services from Business Sector and Business Sector supplies these goods and services. Whatever is not spent is saved which is flowed to the Business Sector as investment that completes the circle.

The circular flow of income as already discussed above explains it in terms of two sector model. But the two sector model can be extended to three and four sector model embracing all the issues.

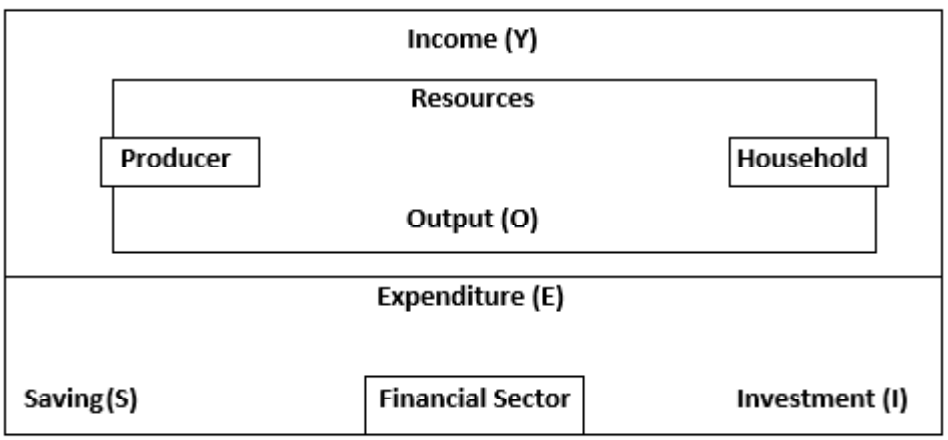
2.3.1 Circular Flow in Three Sector Model

In a three sector model of circular flow, it includes household sector, producing sector and government sector. In a three sector model we have Household Sector, Business, and Government. Here Government collects taxes from the Business Sector and also spends on goods and services from Business Sector. Here, the

flow of income is explained in a closed economy excluding the rest of the world. The flows from household and producing sector to government sector are in the form of payments of different types of taxes and non-taxes. The income received by the government sector flows to producing and household sector in the form of payments for government purchases of goods and services as well as payment of subsidies and transfer payments. Each payment has a receipt in response of it by which aggregate expenditure of an economy becomes identical to aggregate income and makes this circular flow unending. The circular flow of income in a three sector economy can be explained with the help of Figure 2.1.

Figure 2.1 shows the interaction between producers, household and financial sector. There has been flow of income from the household sector to the production sector as they have to pay in terms of money for goods and services purchased. There is again interaction among production sector, household sector and financial sector. It is usually the household sector who wants to save in the financial sector. There is flow of resources from the financial sector to the production sector. The financial sector collects the savings from the household sector and supplies those savings to the producers for investment.

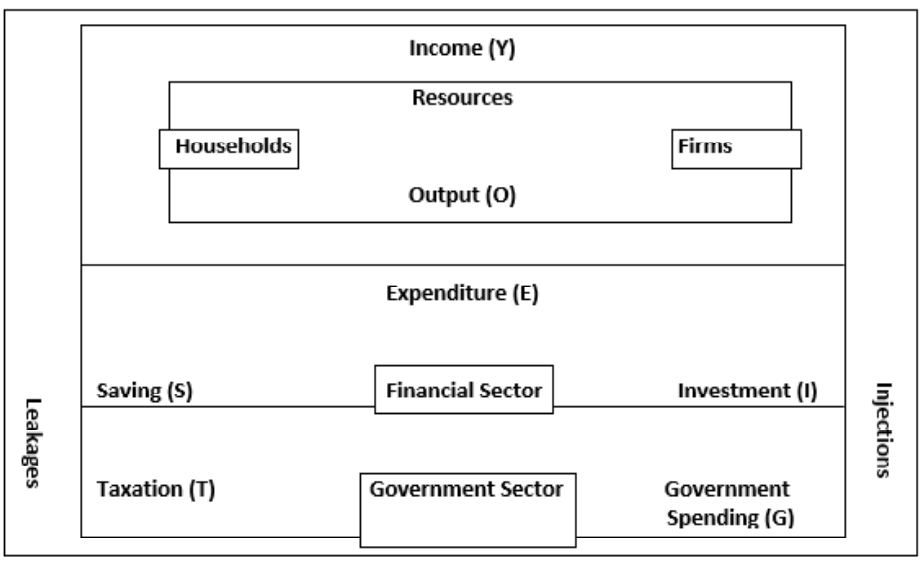
Figure 2.1: Circular Flow of Income in a Three Sector Economy



2.3.2 Circular Flow in Four Sector Model

The four sector model is considered to be complicated as compared to two and three sector model. But it is considered to be more realistic as a modern monetary economy comprises a network of four sector economy such as household sector, firms or producing sector, government sector and financial sector. In four sectors model, we have Household Sector, Business, Government, and External Sector. Here External sector sells goods and services to Household Sector and Business Sector in terms of imports and buys from the Business Sector in terms of exports. Each of these sectors of the economy receives some payments from the other sectors. Money is the factor that facilitates smooth exchanges of those transactions among the sectors. A residual of each market comes in capital market as saving which in turn is invested in firms and government sector. It has been observed that so long as leakage is equal to injections i.e. lending is equal to the borrowing, the circular flow will continue indefinitely. However, this job is to be done by financial institutions in the economy. The circular flow in a four sector economy can be explained with the help of Figure 2.2.

Figure 2.2: Circular Flow of Income in a Four Sector Economy



As shown in Figure 2.2, in a four sector economy, along with household, firms and government sector, financial sector is also there. There has been simultaneous flow of resources among these four sectors. There is flow from the rest of the sectors to the government sector in terms of tax and non-tax revenue. Similarly, there is outflow from the government sector in terms of spending incurred by the government. There has been again flow of resources from the household sector to financial sector and vice-versa. The household sector keeps their savings in financial sector to earn interest. There is flow of resources from the financial sector to the household sector in terms of loan to the household sector. Similarly, there has been inflow and outflow of resources between business firm and government sector. To make investment, the firms take loan from the financial sector and there is outflow of resources from the business firm to the financial sector in terms of repayment of the principal and interest. This is process of flow of resources among different sectors of an economy.

2.4 DIFFERENT FORMS OF NATIONAL INCOME ACCOUNTING

In this section of the chapter, a discussion is carried out regarding the different forms of National Income accounting. National Income Accounting is a set of procedures and techniques for measurement of income and output at aggregate level. The study of national income accounts is of great importance. A system of national income accounting does for the economy as a whole what private accounting does for the individual business firms. The different forms of national income accounts have already discussed in unit 1. In this section, we shall particularly focus on the concepts of social accounting, flow of fund accounting, input-output accounting and balance of payments accounting.

2.4.1 Social Accounting

In the previous section, we have discussed about national income accounting. In this section, a detailed discussion is carried out on the concept and importance of social accounting. Social accounting is often used as an umbrella term to describe a broad field of research and practice. It is the process of communicating the social and environmental effects of organizations' economic actions to particular interest groups within society and to society at large. It is generally observed that different terms has been used to represent Social Accounting such as social accounting and auditing, social accountability, social and environmental accounting, corporate social reporting, corporate social responsibility reporting, non-financial reporting or accounting. But the concept of Social Accounting is commonly used in the context of business, or corporate social responsibility (CSR), although any organisation, including NGOs, charities, and government agencies may engage in social accounting. In this context, Professor David Crowther, defines social accounting as an approach to reporting a firm's activities which stresses the need for the identification of socially relevant behaviour, the determination of those to whom the company is accountable for its social performance and the development of appropriate measures and reporting techniques. It is an important step in helping companies independently develop Corporate Social Responsibility programs which are shown to be much more effective than government mandated CSR.

The importance of social accounting can be assessed from the fact that it demonstrates the extent to which an organization is meeting its stated social or ethical goals. This is because business is a socio-economic activity; hence its objective should be the welfare of the society. The business firms should owe a responsibility towards solving many of the social problems. This is more relevant in the present age of growing technological, economic, cultural and social

awareness. The accounting system has not only to fulfill its stewardship function, but also to accomplish its social functions. It has been generally observed that changing environments and social parameters have compelled business enterprises to account and report information with regard to discharge of their social responsibilities. There has been significant rise in the importance of social accounting as a result of high level industrialization which has brought many problems to the society. To nullify the adverse effects of industrialization, it requires huge amounts of fund for disposal of their waste product and invest substantial amount in social activities. The concept of socialistic pattern of society, civil rights movement, environmental protection, ecological conservation groups, increasing awareness of society towards corporate social contribution etc are some of the other factors for increasing awareness about social awareness. The benefits of social accounting for a business firm have been listed below:

- It gives an opportunity to the business firm to fulfill its social obligation and to inform the general public as well as the government to form correct opinion.
- Social accounting helps to counter the adverse publicity or criticism leveled by hostile media and other social organizations.
- It also assists management in formulating appropriate policies and programmes.
- It is with the help of social accounting, the firm proves that they are not socially unethical in view of moral cultures and environmental degradation.
- Social accounting acts as an evidence of social commitment and improves motivation of the employees.
- Through social accounting, the management gets feedback on its policies aimed at the welfare of the society.
- It improves the confidence of the shareholders of the firm.



CHECK YOUR PROGRESS

Q 1: State whether the following statements are True (T) or False (F).

(a) In a three sector model we have Household Sector, Business, and Government. (True/False).

(b) Social Accounting includes environmental effects of organizations' economic actions. (Yes/No)

Q 2: What is meant by social accounting? Answer in about 60 words.

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2.4.2 Input-Output Accounting

Input-Output analysis is one of the very important areas of economic study. It has been frequently and rigorously used in economics. In economics, an input-output model is a quantitative economic technique that represents the interdependencies between different branches of a national economy or different regional economies. The famous economist Wassily Leontief is credited with developing this type of analysis. He was honoured with the Nobel Prize in Economics for his development of this model.

The input-output accounting model depicts inter-industry relationships within an economy, showing how output from one industrial sector may become an input to another industrial sector. In the inter-industry matrix, column entries typically represent inputs to an industrial sector, while row entries represent outputs from a given sector. This format therefore shows how dependent each

sector is on every other sector, both as a buyer of outputs from other sectors and as a supplier of inputs. Each column of the input-output matrix shows the monetary value of inputs to each sector and each row represents the value of each sector's outputs.

The following assumptions are adopted for input output analysis:

- Each sector (or industry) produces only one homogeneous commodity and there is no joint production.
- Each sector (or industry) use fixed input ratio (or factor combination)
- The production of each sector (or industry) is subject to constant return to scale.

Based on the above assumptions, the input output accounting deals with the problem of internal consistency in terms of equality of demand and supply of sectoral output. The output of a sector is used as intermediate inputs for other sectors of the economy as well as for final consumption. The final consumption includes household consumption, government consumption, investment demand, inventory demand and export demand of a particular output. But a part of the internal demand of a commodity for intermediate and final demand use is also met through import. Let us suppose that we have an economy with different sectors. Each sector produces 1 unit of a single homogeneous good. Assume that the sector, in order to produce 1 unit must use 1 units of input from other sector. Furthermore, assume that each sector sells some of its output to other sectors (intermediate output) and some of its output to consumers (final output, or final demand).

The input-output accounting of national income is usually presented in an input-output table which is based on a transaction matrix. A transaction matrix shows how the total output of one industry is distributed to all other industries as inputs and for final demand. It is required to be mention here that sometimes, a particular sector does supply inputs to itself such as agriculture provides itself

inputs such as seeds to sow in the next season. Similarly, other sectors also provide inputs to themselves. A simple input output matrix of an economy is shown in Table 2.1. Here, it is assumed that a particular sector is not supplying inputs to itself.

Table 2.1: Input-output Transaction Matrix

Sectors	→ Inputs				
	Agriculture	Manufacturing	Others	Final Demand	Output
	1	2	3	4	5 (1+2+3+4)
Agriculture	-	15	5	22	42
Manufacturing	12	-	17	16	45
Others	8	12	-	30	50
Imports	7	5	8	7	27
Primary inputs	15	13	20	-	48
Total Gross Input	42	45	50	75	212

In Table 2.1, the total gross output of the agricultural sector of the economy is set in the first row. It consists of Rs 15 crores to the manufacturing sector, Rs 5 crores to the other sectors, and Rs 22 crores to satisfy the final demand which comprises exports (X), capital (K), government consumption (G) and personal consumption (C). Thus the total gross output of the agriculture sector is Rs 42 crores consisting of 20 crores of intermediate products (manufacturing and others) and 22 crores of final demand. Similarly out of the total output of Rs 45 crores of manufacturing sector, Rs 29 crores is used for self consumption, and rest of the Rs 16 crores is used for final demand. Likewise, other rows of the input matrix show the distribution of output of other sectors and from imports and primary inputs. Primary inputs are the sum of payments as wages, profits, etc, and depreciation. They are also called value added.

If we analyze the input matrix column wise, the first column shows inputs to the agricultural sector coming from the various sectors of the economy. For example, inputs worth Rs 15 crores from the agriculture sector, Rs 12 crores form the other sectors, 5

crores from import and Rs 13 crores of primary inputs are used in the manufacturing sector.

The input output accounting model is of tremendous practical value and importance. The importance of the input output accounting has been mentioned below:

- With the help of input-output model, one can know the varieties and quantities of goods which the producer and the other firms buy and sell to each other. In this way, he can make the necessary adjustments and thus improve his business prospect vis-à-vis other producers.
- It is possible to analyze the effects of prolonged strike, of a war and of a business cycle.
- Input-output model provides a more detailed breakdown of the macro aggregates and money flows. As a result, it is used extensively for national income accounting.
- The input-output accounting is considered useful in national economic planning. It provides necessary information about the structural coefficients of the various sectors of the economy during a period of time or at a point of time which can be utilized for the optimum allocation of the economy's resources towards end.
- The input-output accounting model gives information regarding inter-relations among firms and industries about possible trends toward combination.
- But there are some limitations of the input output accounting analysis. The limitation of the input-output model has been provided below:
- Constancy of Input Coefficient: This assumption of constant input coefficient is unrealistic as some industries may have identical capital structure and some may have heavy capital requirements while others may use no capital.

- The assumption of fixed coefficient of production ignores the possibility of factor substitution. There is always the possibility of some substitutions even in the short period, while substitution possibilities are likely to be relatively greater over a longer period.
- The rigidity of input output model cannot reflect such phenomenon as bottlenecks, increasing costs etc.
- The input output model is considered as restricted model as it lays exclusive emphasis on the production side of the economy. It does not tell us why the inputs and output are of a particular pattern in the economy.
- This analysis operates on the basis of a fixed quantity of an input for the production of per-unit of output. As factors are mostly indivisible, the increases in outputs are not expected to be in proportion to the increase in inputs.
- The input output model works on the equation which cannot be solved easily. Here, the models of equations are prepared and then large numbers of data are collected. Equations require through knowledge of higher mathematics and the collection of data is not so easy. This makes the construction of input-output model difficult.



CHECK YOUR PROGRESS

Q 3: What does a transaction matrix exhibit? Answer in about 20 words.

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2.4.3 Flow of Fund Accounting

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

In fact, the national income accounts do not take into consideration the financial dimensions of economic activity and they describe product accounts as if they are operated through barter system. The flow of funds accounts are meant to supplement national income and product accounts. The flow of funds accounts was developed by the economist from United States Prof. Morris Albert Copeland to overcome the weaknesses of national income accounting. He criticized 20th century macroeconomic theory and contributed to the development of modern flow of fund theory.

The flow of funds accounts list the sources of all funds received and the uses to which they are put within the economy. They show the financial transactions among different sectors of the economy and the link between saving and investment aggregates with lending and borrowing by them. The account for each sector reveals all the sources of funds whether from income or borrowing and all the uses to which they are put whether for spending or lending. This way of looking at financial transactions is known as the flow of funds approach or sources and uses of funds. In the flow of funds accounts, all changes in assets are recorded as uses and all changes in liabilities are recorded as sources. Uses of funds are increases in assets if positive or decreases in assets if negative. They refer to capital expenditures or real investment spending which involve the purchase of real assets. The flow of fund account can be explained with the help of a hypothetical example as produced in Table 2.2.

Table 2.2: Flow of Fund Account Matrix

	Accounts					
`Receipt from Payment to	(1) Production	(2) Consumption	(3) Government	(4) Capital	(5) Foreign	(6) Total
Production	-	279	12	9	9	309
Consumption	219	-	45	15	6	285
Government	30	6	-	15	6	57
Capital	36	-	-	-	3	39
Foreign	24	-	-	-	-	24
Total	309	285	57	39	24	714

In Table 2.2, each account has one row which shows the payments, and one column which shows the receipts. Row 1 shows payments made by the business sector to the tune of Rs 279 crores to the consumption sector as wages, salaries, etc., Rs 12 crore to the government as taxes, Rs 9 crores as corporate saving to the capital account of firms and Rs 9 crores for importing goods and services from abroad. Similarly rows 2 shows the payment made to the business sector by the household sector amounting to Rs 219 for buying goods and services from it, Rs 45 crore to the government in paying taxes, and insurance contribution, Rs 15 crore to the investment sector in the form of saving by household consumers and Rs 6 crore as investment in foreign securities, expenses in education, travel etc. in foreign countries. Outflow of the government sector has been shown by row 3. Row 4 reveal the capital account of the economy where Rs 36 crore is made to the business sector for capital goods and net change in inventories, and Rs 3 crores are net foreign inventories. The foreign account or rest of the world account has been shown in row 5. Similarly, the receipt from each sector can be explained column wise.

The importance of flow of fund account lies in the fact that it presents a comprehensive and systematic analysis of the financial transaction of the economy.

- The flow of fund account is generally considered as superior to national income accounts as the latter do not reveal the financial transaction in the economy.
- The flow of fund account is used extensively for studying the behavior of the individual financial institutions of the economy.
- Professor Goldsmith is of the view that flow of fund accounts brings the various activities of an economy into explicit statistical relationship with one another.
- The flow of fund account traces the financial flows that interact with and influence the real saving-investment process. They also

record various financial transaction underlying saving and investment.

- Ø The flow of fund account provides essential raw materials for any comprehensive analysis of capital market behavior and thus helps to identify the role of financial institution in the generation of income, savings and expenditure.
- Ø The financing pattern of government deficit and generation of surplus budget can be known from the flow of fund accounting.
- Ø The flow of fund account also provides information regarding results of transaction in government and corporate securities, net increase in deposits and foreign assets in the economy.
- Ø They help in analyzing the impact of monetary policies in brining stability in an economy
- Ø But although it has a number of advantages over national income accounts, the flow of fund accounts are beset with a number of problems which have been discussed below:
- Ø The flow of fund account are considered as more complicated as compared to national income accounts as they involve the detailed financial aggregation of large number of sectors.
- Ø Valuation of assets is another problem of flow of fund accounts as many assets, claims and obligations have no fixed value.
- Ø The problem of inclusion of non-producible real asset arises in the flow of fund accounts as economist has not been able to decide as to the type of non-producible real asset to include in the flow of fund accounts. Economists have failed to decide about the inclusion of human wealth in flow of fund accounts.

But despite these limitations, the flow of fund accounts has utility in economic analysis and it supplements the national income accounts. It also helps in understanding the social accounts of an economy.

2.4.4 Balance of Payment Accounting

In the previous section of the chapter, we have discussed about flow of fund accounts. In this section of the chapter, a discussion is carried out about balance of payments accounts.

The balance of payments accounts abbreviated as B.O.P. or BoP of a country is the record of all economic transactions between the residents of the country and the rest of world in a particular period usually over a quarter of a year or more commonly over a year. Here, residents' means businesses, individuals and government agencies, including citizens temporarily living abroad but excluding local subsidiaries of foreign corporations. The balance of payments accounting is double entry where all transactions are either debit or credit transactions. Credit transactions result in receipt of payment from foreigners such as merchandise exports, transportation and travel receipts, income received from investments abroad, gifts received from foreign residents, remittances from abroad, foreign portfolio investment, foreign direct investment and aid received from foreign governments etc. Debit transactions involve payments to foreigners such as merchandise imports, transportation and travel expenditures, and income paid on investments of foreigners, gifts to foreign residents, aid given by home government, overseas investments by home country residents, repayment of loans etc. Each credit transaction has a balancing debit transaction, and vice versa, so the overall balance of payments is always in balance. The current Account (all real transfers) of balance of payments includes merchandise trade, service trade and transfers. The Capital and Financial Account (transfers of ownership and financial assets and liabilities) broadly includes transaction in real assets, financial instruments and central bank reserve. The BOP (Current Account) is the flow component while BOP (Capital Account) is the stock component. Both can be positive or negative. But collectively they become balanced or zero. Due to the double entry

book keeping system a surplus (deficit) in the current account will be exactly balanced by a deficit (surplus) in the capital account. As a result, a BOP always balances. The study of balance of payments has become a matter of great interest to all concerned as it reveals the financial condition of a country. Other uses of balance of payments of a country are as follows:

- Balance of payment accounts has great value in forecasting and evaluating business and economic conditions of a country.
- Balance of payments accounts are used to determine the appropriateness of the exchange value of currency. It can also give information about economic solvency of a country.
- The most important use of balance of payment account is that it reveals the nature, size, composition and direction of a country's international trade.
- It clarifies the foreign exchange position of a country and thus helps the businessmen in selecting market for their products.
- It helps the government to decide the trade, industrial and economic policies of the country.
- A simple example of balance of payments accounts has been provided below in Table 2.3. The credits are generally shown on the left hand side and debits are shown on the right hand side.

Table 2.3: A hypothetical example Balance of Payment Accounts

Credits	Amount (in Rs)	Debits	Amount (in Rs)
Exports of goods(visible)	600	Imports of Goods	800
Export of services (invisible)	200	Import of servicse	100
Unilateral transfers (gifts, remittances,indeminities, etc. received from foreigners)	100	Unilateral transfers(gifts, indemnities etc. paid to foreigners)	150
Capital Receipts (borrowings from abroad, capital repayments by, or sale of assets to the foreigners)	200	Capital payments(lending to, capital repayments to, or purchase of assets from foreigners)	50
Total receipt	1100	Total Payments	1100

As shown in Table 2.3, the sum of all transaction recorded in the balance of payments must be equal to zero. In our example, total receipts of Rs 1100 crore are equal to total payments of Rs 1100. This is because every credit appearing in the current account has a corresponding debit in the capital account and vice-versa. As we can see above, the current account deficit is Rs.150 (Rs.900-Rs.1050) while capital account surplus is exactly Rs.150 (Rs.200-Rs.150).



CHECK YOUR PROGRESS

Q 4: State whether the following statements are True (T) or False (F).

(a) In flow of fund accounting, uses of funds are considered increases in assets if positive or decreases in assets if negative. (True/False).

(b) The current Account (all real transfers) of balance of payments includes Merchandise trade. (True/False)

Q 5: Why the overall balance in a balance of payments statements is always balanced? Answer in about 40 words.

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2.5 LET US SUM UP

- The circular flow of income or circular flow is a model of the economy where exchanges between economic agents are represented by flows of money, goods as well as services etc.
- National Income Accounting provides a set of procedures and techniques for measurement of income and output at an aggregate level.

- Social Accounting is the process of communicating the social and environmental effects of organizations' economic actions to particular interest groups within society and to society at large.
- In economics, an input-output model is a quantitative economic technique that represents the interdependencies between different branches of a national economy or different regional economies.
- The flow of funds accounts list the sources of all funds received and the uses to which they are put within the economy. They show the financial transactions among different sectors of the economy and the link between saving and investment aggregates with lending and borrowing by them.
- BoP of a country is the record of all economic transactions between the residents of the country and the rest of world in a particular period usually over a quarter of a year or more commonly over a year.



2.6 FURTHER READING

1) Ajuja, H. L. (2007). Macroeconomics: Theory and Policy. New Delhi: S.Chand & Co.
2) Baunmol, W. J. and Alan, S. B. (2006). Macroeconomics: Principles and Policy. New Delhi: Cengage Learning.
3) Jhingan, M. L. (2003). Macro-economic Theory. New Delhi: Vinda Publications Limited.



2.7 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: (a) True (b) True.

Ans to Q No 2: Social accounting is an approach to reporting a firm's activities which reflects its socially relevant behaviour, the determination of those to whom the company is accountable for its social performance and the development of appropriate measures and reporting techniques. It is an important step in helping companies independently develop Corporate Social Responsibility programs which are shown to be much more effective than government mandated CSR.

Ans to Q No 3: A transaction matrix shows how the total output of one industry is distributed to all other industries as inputs and for final demand.

Ans to Q No 4: The balance of payments accounting is double entry where all transactions are either debit or credit transactions. In a BOP statement, each credit transaction has a balancing debit transaction, and vice versa. As a result, the overall balance of payments is always in a BOP statement is always balanced.

Ans to Q No 5: (a) True (b) True.



2.8 MODEL QUESTIONS

A) Short Questions (Answer the following questions in about 150 words)

Q 1: Briefly discuss the concept and social accounting.

Q 2: Discuss the importance of social accounting.

B) Essay type Questions (Answer the following questions in about 300 - 500 words)

Q 1: Explain in detail the importance of flow of fund accounts of an economy.

Q 2: Discuss the balance of payments accounts with a hypothetical example.

Q 3: What is input output accounting? Make a detailed analysis of input output accounting.

Q 4: Explain the concept and importance of social accounting.

Q 5: Discuss the limitation and importance of balance of payment accounts of a country.

Q 6: Explain the components of Balance of Payments.

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UNIT 3: CLASSICAL THEORY OF NATIONAL INCOME DETERMINATION

UNIT STRUCTURE

3.1 Learning Objectives

3.2 Introduction

3.3 Say's Law of Market

- 3.3.1 Say's Law of Market: Important Facts
- 3.3.2 Say's Law of Market: Its Propositions and Implications

3.4 The Classical Theory of Employment and Income

- 3.4.1 Assumptions
- 3.4.2 Aggregate Production Function
- 3.4.3 Demand Function for Labour
- 3.4.4 Supply Function for Labour
- 3.4.5 Equilibrium Level of Income and Employment

3.5 Keynes' Criticisms on Full Employment Equilibrium

3.6 Let Us Sum Up

3.7 Further Reading

3.8 Answers to Check Your Progress

3.9 Model Questions

3.1 LEARNING OBJECTIVES

After going through this unit, you will be able to-

- explain Say's law of market and also its propositions and implications discuss the operation of economic system as conceived by the classical economists
- get a clear idea on the demand for and supply of labour
- discuss how income and level of employment are determined in classical system
- explain the loopholes of full employment in classical analysis as conceived by Keynes.

3.2. INTRODUCTION

In the last unit, we have learnt about circular flow of national income within different sectors of the economy. Thus, now, we have ideas regarding how production of goods and services; and how distribution and consumption of the same is managed within the economy. As the modern economies are becoming complex day by day, the ideas relating to the functioning of the macroeconomic systems also started differing. Today's macroeconomic concepts differ widely from that of the classical era. In this unit we will look into the macroeconomic foundation of earlier days.

3.3 SAY'S LAW OF MARKET

Jean Baptiste Say's law is the benchmark of classical school of thought. According to the law, the market economy is governed by the principle "supply creates its own demand". That is, production of goods and services automatically creates their demand. Whatever is produced gets automatically sold in the market and thus consumed. Therefore, there cannot be general overproduction of goods and services in the economy. As a result, problem of unemployment also does not arise.

3.3.1 Say's Law of Market : Important Facts

- **Production Creates Market for Goods:** In the production process productive factor inputs (for example, labour) earn income as remuneration for their contribution to the production process. With this income they purchase the goods from the market for their own use. This in turn creates own demand, that is, for the already produced goods.
- **Barter Economy as the Basis:** Whatever is produced, a part of it is kept for self consumption. The others are exchanged for products of other producers. In this way, whole produce get exhausted. In a free-exchange economy, factor income generates demand for goods and services. Thus, the existence of money does not alter the Say's law.

- **Impossibility of General Over -Production:** According to the law, the very act of supplying goods implies a demand for them. If, for instance, overproduction of any commodity occurs, there will be re-determination of exchange ratio of this commodity with others. Thus, more amount of this commodity will be exchanged with the same amount of the others. At the same time, its current production is also reduced. The process will continue until overproduction disappears. Thus, this law rules out the possibility of general overproduction.
- **Savings-Investment Equality:** To avoid general overproduction, equality of savings and investment is maintained. A part of factor income in the form of rent, wage and interest is saved. The saved amount is automatically invested for further production. Thus whatever is saved, invested.
- **Rate of Interest as a Determinant Factor:** Equality between saving and investment is maintained through 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 because while saving and rate of interest is positively related, investment is inversely related to the rate of interest. In the opposite situation, 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.

3.3.2 Say's Law of Market: Its Propositions and Implications

Main propositions and implications of Say's law can be understood from the following.

- **Full employment:** Full employment is a natural phenomenon of the economy. As more and more goods are produced, more and more factors of production get employment. In the process, the level of full employment is reached. Full employment is a

situation where all productive factors engage in the production of goods and services. Volume of production becomes maximum in this stage.

- **Resource utilisation:** As there is full employment in the economy, none of the resources remain idle. More and more income get generated via proper and increasing use of productive resources.
- **Perfect competition:** Entire analysis of J.B. Say and other thinkers of the classical era is based on the proposition of perfect competition in both product as well as factor market. Thus, as a feature of perfectly competitive market, many buyers and sellers of factors as well as products operate simultaneously.
- **Automatic adjustment:** There exists automatic and self-adjusting mechanism in different markets. For example, in the capital market, investment and saving are always equal. It is so through the adjustment of the rate of interest. Similarly, in the labour market, adjustment in wage (real) rate bring equality between demand and supply of labour.
- **Money is neutral:** Money functions only as a medium of exchange. It does not affect the production process at all.
- **Policy of Laissez-faire:** Automatic and self-adjusting process can function smoothly only when the economy runs under the policy of laissez-faire. The law assumes a closed capitalist economy running with laissez-fair policy.
- **Saving as a social virtue:** A part of factor income is saved and automatically invested. It contributes to production as well as consumption process further.



CHECK YOUR PROGRESS

Q 1: State whether the following statements are true (T) or false (F)

(a) In Say's law, supply depends on demand. (T/F)

(b) Say's law is applicable both in barter as well as in money economy. (T/F)

Q 2: Mention the Say's law? (Explain in 40 words)

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Q 3: State the main implications of Say's Law ?(Explain in about 60 words)

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3.4 THE CLASSICAL THEORY OF EMPLOYMENT AND INCOME

The classical theory employment and income is the theory of full employment. It is only the analysis of adjustment through which equilibrium is maintained at the level of full employment.Thus full employment is regarded as a normal situation. Any deviation from this level get automatically corrected. Given wage-price flexibility, several economic forces operate in the economy and they together tend to maintain full employment, and produce output at that level.

3.4.1 Assumptions

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

- There is a state of full employment without inflation.
- There is perfect competition in product and labour markets.
- There is closed laissez-fair economy.

- Ø Supply creates its own demand
- Ø There is perfect wage-price flexibility
- Ø The quantity of money is given
- Ø Money acts only as a medium of exchange.

Given the assumptions, according to this theory, in its simplest form, equilibrium levels of employment and income/output are determined by the aggregate production function and the demand and supply schedules of labour. Thus, the determination of output and employment in classical theory occurs in labour, goods and money markets of the economy.

3.4.2 Aggregate Production Function

Given a fixed stock of capital and technology in the short period,the Aggregate Production Function postulates a positive relationship between output and employment. A higher level of output is associated with a higher level of employment and vice versa.

$Q=f(N, K, T)$

Where Q denotes the level of output, N is the level of employment and K and T represent the fixed stock of capital and technology respectively.

3.4.3 Demand Function for Labour

As additional laboursare employed, output goes on increasing. However, productivity of additional labourers employed starts falling gradually. In other words, marginal physical productivity (MPL) diminishes. Table 3.1 depicts this scenario.

Table 3.1: Output, Employment and Marginal Product of Labour

Output	Employment	MP_L
2000	400	-
2200	450	4.0
2350	500	3.0
2450	550	2.0
2500	600	1.0

Any business firm will provide employment to labour up to an extent where the real wages paid out to the workers become equal to the marginal physical product of labour. Thus, wheather a labour gets employment or not depends on its marginal physical productivity. The profit maximising condition of a firm is:

$W/P=MP_L$

Since demand for labouris determined by the MPL, and the real wage (W/P) equals the MP_L, the demand for labour is also a function of real wages. It varies inversely with real wages.

$D_L=f(W/P)$

3.4.4 Supply Function for Labour

Getting employmentis generally known as sacrifice of leisure on the part of workers. Additional work-load means increase in marginal disutility of labour. Because work involves strain, exertion and sacrifice of leisure. Workers can be induced to put in additional labour input only when this disutility is neutralised through payments of additional real wages. Thus,the supply of labour is positively related to the real wage.

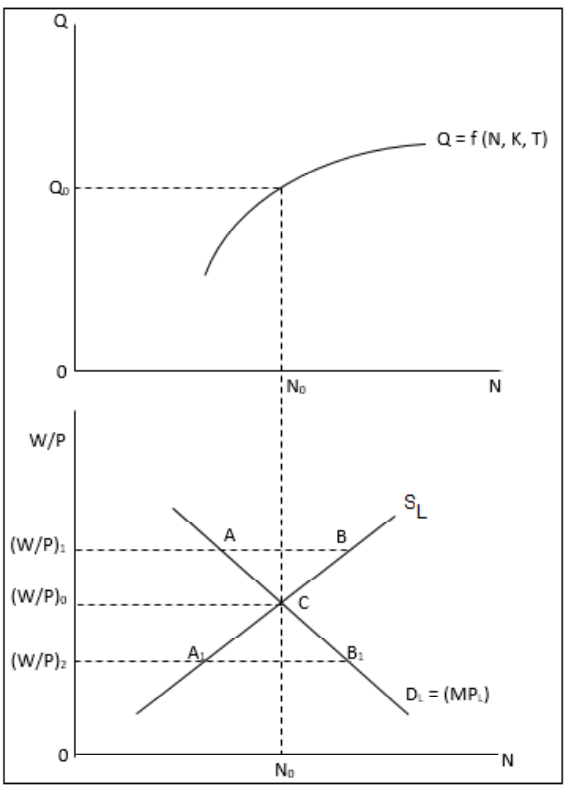
$S_L=f(W/P)$

3.4.5 Equilibrium Level of Income and Employment

Given the demand and supply functions of labour, it is possible to determine equilibrium level of employment and income. In figure 3.1, demand and supply of labour get equalized at real wage rate (W/P) o and employment level ONo. So, these two are the equilibrium real wage rate and employment level respectively. If the real wage rate (W/P)1 is higher than the equilibrium rate, there will be excess supply of labour (equal to the amount AB) in relation to demand. So, there occurs competition among workers to get a job. Ultimately, real wages will come down to the level (W/P)o. The decline of real wages will reduce unemployment gap and there will

be a tendency towards the achievement of equilibrium at full employment ONo.

Figure 3.1: Determination of Equilibrium Levels of Employment and Income



On the other hand, if the real wage rate is lower than equilibrium wage rate, say $(W/P)_2$, the employers will try to absorb more workers. This excess demand (equal to A_1B_1) for workers will bid up the wage rate to the level $(W/P)_0$, and employment to ON_0. The equilibrium level of employment (ON_0) represents a state of full employment and maximum possible national output. Thus, who are willing and able to work at wage rate $(W/P)_0$, have been absorbed, except a very small proportion of frictionally unemployed labour force.

It becomes clear that in the classical system, the unemployment and over employment gaps tend to be automatically adjusted through flexibility of wages. In other words, employment (output) can be increased only through reducing wages. Thus, the key to full employment is a reduction in real wage.

The determination of the price level (P) here is explained by the famous Classical Quantity Theory of Money. It states that price level is a function of the supply of money. Algebraically, MV=PT; where M,V, P,T are the supply of money,velocity of circulation of money, price level and the volume of transaction (or total output) respectively. This identity represents money market equilibriumwhich states that total money supply MV equals the total value of output PT in the economy. T, the total output represents the full employment output. Assuming V and T constant, M and P varies proportionately with each other. Thus, a change in money supply (M) causes a proportional change in the price level. In other words, it exhibits the medium of exchange function of money.



CHECK YOUR PROGRESS

Q4: State whether the following statements are true (T) or false (F)

a) In the classical system, unemployment is a natural situation in the economy (T/F).

b) Unproductive labours also get employment in the classical theory of employment and income(T/F)

Q 5: What is Aggregate Production Function? (Explain in about 40 words)

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Q6: Explain supply function for labour. (Answer in about 40 words)

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3.5 KEYNES' CRITICISM ON FULL EMPLOYMENT EQUILIBRIUM

Keynes repudiated the classical theory of full employment equilibrium and demonstrated the possibility of less-than full employment equilibrium. He considered that classical argument was correct, but only for a particular industry or firm. It cannot be generalised for the economy as a whole. Keynes attacked the classical theory on the following grounds:

- A capitalist society does not function following Say's law. In reality, supply normally exceeds its demand. There exist millions of workers who are willing to work at the current wage rate and even below it, but they fail to get the same. Thus there exists involuntary unemployment in capitalist economies and equilibrium is established at a situation of less than full employment situation.
- A part of factor income earned by factor inputs is saved and is not consumed. It results in a deficiency of aggregate demand. Because of this deficiency there will be general overproduction and further unemployment.
- Keynes pointed out that capitalist society comprises of two sections: rich and the poor.The former possess much wealth, but they do not spend the whole of it on consumption due to low marginal propensity to consume. The poor, with high marginal propensity to consume, cannot consume as per their aspiration with low income. Thus there is general deficiency of aggregate demand in relation to aggregate supply which leads to overproduction and unemployment in the economy.
- Wage cut as prescribed by classical economists will certainly reduce cost of a particular firm or industry. It will not reduce demand for the product of the firm/industry. If all the industries of the economy as whole cut wage, it will certainly reduce demand for goods and services. Because, according to Keynes, wages are not only the costs of production, but also the income of the labourers. Wage cut will definitely decrease demand and hence national income and employment.

- Moreover, in modern times, wage cut policy cannot be formulated. The workers have formed strong trade unions which resist a cut in money wage. There are also legislations across countries on minimum wages.
- The classical economists believed that savings and investment are always equal via the rate of interest. But the equality of these two is brought about not by interest rate, but by variations in income. According to Keynes, level of saving depends on income and not on the rate of interest. Similarly, it is not only the rate of interest but also the marginal efficiency of capital, which determine the level of investment. If savings exceeds investment, it means people are spending less on consumption. As a result, demand declines. There is overproduction. In such a situation, investment cannot increase due to low business expectation. It happens even if the rate of interest falls. It will lead to fall in income, employment and output. Ultimately, saving will reduce and it becomes equal with investment at a lower level of income.
- To attain full employment, according to Keynes, State intervention is necessary. As the capitalist system is not self adjusting, the state can directly invest in order to supplement private investment or to raise economic activity.
- Economic activities are dictated by short run variables. Because, Keynes believed that in the long run we are all dead. During short run, economic variables such as tastes, habits, (as a result consumption demand), techniques of production etc. remain static. Under such a situation, emphasis should be on increasing investment-the other constituent of aggregate demand. Otherwise, there will be mass unemployment. The equilibrium so reached cannot be at the level of full employment.
- Thus, classical theory of income determination is totally unrealistic and fails to solve complex problems of modern capitalist economies.



CHECK YOUR PROGRESS

Q7: State whether the following statements are true (T) or false (F)

a) According to Keynes full employment is a natural phenomenon in the economy.(T/F)

b) In regard to Keynesian view, there exists an automatic adjustment mechanism in the economy(T/F)

Q8: What will happen, according to Keynes, to employment and output when wages are cut? (Answer in about 60 words)

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Q9: What is the nature of unemployment in a capitalist economy (Answer in about 50-60 words)

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3.6 LET US SUM UP

- Say's law of market states that:
  - Supply creates its own demand.
  - Economic systems are self-adjusting.
  - Perfectly competitive market structure paves the way for this self adjustment.

- Ø There cannot be general overproduction of goods and services in the economy.
- Ø Thus full employment is a natural phenomenon of the economy.
- Ø Resources are efficiently utilised in this way.

I Based on same background of Say's Law, Classical Theory of Income Determination was postulated. It states that:

- Ø Employment and income/output are determined by the aggregate production function and the demand and supply schedules of labour.
- Ø Demand for labourvaries inversely with real wages.
- Ø Supply of labour varies positively with real wages.
- Ø Employment of labour can be increased only trough wage-cut.

I Keynes vehemently opposed classical thinking on the following grounds.

- Ø There exists involuntary unemployment in capitalist economies.
- Ø Equilibrium is established at a situation of less than full employment situation.
- Ø Unemployment arises due to deficiency of aggregate demand.
- Ø Wage cut policy reduces aggregate demand and as result, the employment level.
- Ø Equality of savings and investment arises through changes in income and not through changes in the rate of interest.
- Ø To increase employment autonomous investment in necessary.
- Ø Short run is the relevant period for analyzing economic activities.



3.7 FURTHER READING

1) Ahuja, H.L. (2007). Macroeconomics: Theory and Policy, New Delhi: S.Chand& Co.
2) Mueller, M.G. (ed) :Readings in Macroeconomics. Art 1 by E.E. Hagen entitled, "The classical Theory of the level of output and employment" (1969).
3) Rana, K.C.&Verma, K.N. (2009). Macro Economic Analysis. New Delhi: Vishal Publishing Co.
4) Shapiro, E.(1988). Macroeconomic Analysis , New Delhi: Galotia Publications Pvt. Ltd

3.8 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: a) False b) True

Ans to Q No 2: Say's law of market states that additional factors employed in the production process produce additional output. Total factor income of these additional factors employed often equals with the market value of the additional output produced by these factors. Thus, whatever is produced, automatically sold in the market. Thus supply creates its own demand.

Ans to Q No 3: Say's law states that supply creates its own demand. Since produced goods are automatically sold in the market, there cannot be general overproduction in the economy. In such a situation, production continues to the level of full employment. Thus economic resources are efficiently utilised. This efficiency get reflected through perfectly competitive market conditions. Large and perfectly competitive labour and goods market are self-adjusting. These markets maintain equilibrium at full employment level. Neutrality of money and laissez fair policy of the economy makes self adjustment process easy. Thus, money acts only as a medium of exchange. Saved money is automatically invested for further production.

Ans to Q No 4: a) False b) False

Ans to Q No 5: Giventhe stock of capital, technical knowledge and resources, a precise relation exists between total output and the amount of employment. This relation is termed as Aggregate Production Function. Thus, Aggregate Production Function shows that in the short run the total output is an increasing function of the number of workers given the capital stock and technological knowledge.

Symbolically, Q=f(N,K,T)

Where Q denotes the level of output,N is the level of employment and K and T represent the fixed stock of capital and technology respectively.

Ans to Q No 6: Labour supply is an increasing function of real wage rate. Thus, supply function of labouris positively related to the real wage. It implies that real wage must increase in order to get more labour. Symbolically,

S_L=f (W/P)

Where, S_L= Labour Supply

W=Money Wage Rate

P= Price Level

Ans to Q No 7: a) False b) False

Ans to Q No 8: Keynes refuted classical formulation that a cut in money wage is a prescription for achieving full employment. The policy can be applied to a particular industry only and not to the economy as a whole.Wages are not only costs but also they are the income of labourers. A cut in wage will definitely reduce their income. Ultimately, aggregate demand falls leading to a decline in employment and output.

Ans to Q No 9: Unemployment in advanced capitalist countries, according to deficiency of effective demand. In these countries, people have high marginal propensity to save and not to consume. As a result, as output increases, consumption expenditure does not increase at the same rate. Investment is also inadequate because of its dependence on future expectations. The result therefore in overproduction and unemployment.

3.9 MODEL QUESTIONS

A) Short Questions (Answer each question in about 150 words)

Q 1: "Supply creates its own Demand" Examine the statement.

Q 2: Write the important facts about Say's law.

Q3: What are the main assumptions of classical theory of determination of income andemployment?

Q 4. How the equilibrium rate of employment is determined in the Classical theory?

B) Essay-typeQuestions (Answer each question in about 300-500 words)

Q 1: "General overproduction and general unemployment are impossible" Discuss.

Q 2: Explain clearly the Classical Theory of Determination of Income and Employment.

Q 3: What are the Keynesian objections against the classical analysis?

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UNIT 4: KEYNESIAN THEORY OF NATIONAL INCOME DETERMINATION

UNIT STRUCTURE

4.1 Learning Objectives

4.2 Introduction

4.3 Keynes Departure from Classical Theory

4.4 Basic Keynesian Framework

4.5 Keynes Theory of Income Determination

- 4.5.1 Effective Demand
- 4.5.2 Aggregate Demand Function
- 4.5.3 Aggregate Supply Function
- 4.5.4 Equilibrium Level of Income and Output

4.6 Relevance for Developing Countries

4.7 Criticisms

4.8 Let Us Sum Up

4.9 Further Reading

4.10 Answers to Check Your Progress

4.11 Model Questions

4.1 LEARNING OBJECTIVES

After going through this unit, you will be able to-

- describe how economic thinking of Keynes differs from that of the Classical thinkers
- derive knowledge of Keynesian economic formulations
- explain about aggregate demand and supply functions and their components
- discuss the Keynesian theory of income determination
- examine whether or not Keynesian theory is applicable to developing countries.

4.2 INTRODUCTION

In the last unit, we discussed about macro-economic foundation laid down by the classical economists. We have learnt how income and output and the level of employment are determined on the basis of Say's law. In this section we will make a macroeconomic analysis, given by J.M. Keynes, a product of prestigious Cambridge University. He initiated a new era of macroeconomic analysis. Keynes's revolutionary work "The General Theory Of Employment, Interest and Money" (1936) is a formidable challenge to the classical economics.

4.3 KEYNES DEPARTURE FROM CLASSICAL THEORY

Keynes attacked the basic premises of the classical theory, and not its logical consistency. According to him, classical theory was perfectly logical, but the difficulty with this theory is that it fails to solve actual economic problems. According to Keynes, equilibrium level of income and employment does not mean full employment equilibrium level, backed by automatic and efficient adjustment mechanism of classical thinkers. There exists no automatic adjustment mechanism in a free-market economy that ensures full employment. There is no guarantee that the saved part of income will be spent on investment goods. Thus, if investment does not increase, there will appear a deficiency of demand. This implies that supply does not create its own demand, as argued by J.B. Say.

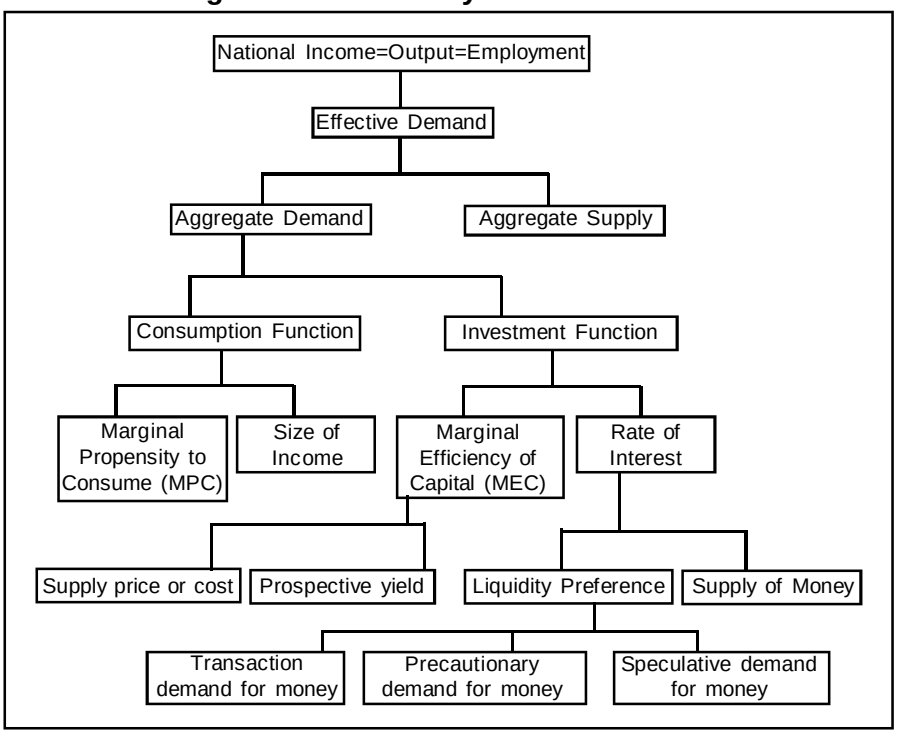
Moreover, Keynes considered that classical argument of wage-cut was correct, but only for a particular industry or firm. Wage cut as prescribed by classical economists, will certainly reduce cost of a particular firm or industry. It will not reduce demand for the product of the firm/industry. However, if all the industries of the economy as whole cut wage, it will certainly reduce demand for goods and services. Because, according to Keynes, wages are not only the costs of production, but also the income of the labourers. Wage cut will definitely decrease demand and hence national income and

employment. We will have a better idea of the foregoing analysis if we look at the basic Keynesian framework of the next section.

4.4 BASIC KEYNESIAN FRAMEWORK

Keynes's analysis was aggregative analysis. His analysis contains all the steps of an econometric model, since he gave importance of methodological models of economic behavior. Basic Keynesian framework has been shown with the help of Figure 4.1.

Figure 4.1: Basic Keynesian Framework



Explanation of the Figure 4.1:

(1) Employment, Output, and Income are intricately related. Output and income increase as employment increases.

(2) Volume of employment depends upon effective demand which in turn is determined by aggregate supply function and aggregate demand function. Keynes assumed aggregate supply function to be given in the short period.

(3) Aggregate demand function is governed by consumption expenditure and investment expenditure.

(4) Consumption expenditure depends upon size of income and propensity to consume. As propensity to consume does not change quickly, consumption expenditure is fairly stable in the short period. Rich people have low marginal propensity to consume.

(5) Investment expenditure is governed by marginal efficiency of capital (profitability of capital) and the rate of interest. It is highly unstable as subjectivity governs both the interest rate and marginal efficiency of capital.

(6) The marginal efficiency of capital is governed by the supply price of capital assets on the one hand and the prospective yield on the other. Prospective yield, in turn, depends upon future expectations. This explains why marginal efficiency of capital and hence investment expenditure fluctuates.

(7) Rate of interest is a monetary phenomenon and is determined by the demand for money (liquidity preference) and the quantity of money. Liquidity preference depends upon three motives: transaction motive, precautionary motive and speculative motive.



CHECK YOUR PROGRESS

Q 1: State whether the following statements are true (T) or false (F).

(a) Poor people have high marginal propensity to consume. (T/F)

(b) According to Keynes investment depends on size of income. (T/F)

Q 2: What will happen according to Keynes, if saving and investment are not equal? (Explain in 50-60 words)

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Q 3: Which determines rate of interest? (Explain in about 60 words)

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4.5 KEYNES' THEORY OF INCOME DETERMINATION

With a methodological framework discussed above, let us proceed towards Keynesian Theory of Income Determination. Keynes was the first to develop a systematic theory of determination of income.According to him, as income and output are the functions of employment; therefore, Keynes' theory of income determination is called the effective demand theory of employment. He was primarily concerned with short-run problems of unemployment as he believed that in the long run we are all dead and, therefore, there is no problem. In the short-run, income, output and employment-all three move in the same direction.

4.5.1 Effective Demand

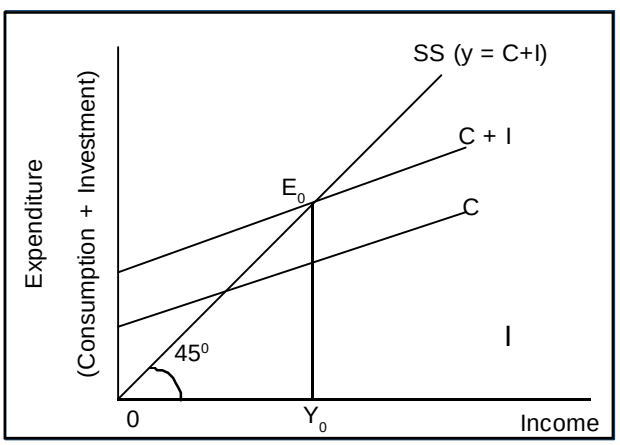
Effective demand is the logical starting point of Keynes' theory of income and employment. The effective demand determines the level of employment and income. Unemployment arises due to deficiency of effective demand. Effective demand means desire plus ability and willingness to buy goods and services. It depends upon aggregate demand function and aggregate supply function.

4.5.2 Aggregate Demand Function

Aggregate demand function represents maximum sale proceeds which the entrepreneurs expect to get from the sale of output at varying levels of employment. It is composed of consumption demand and investment demand. Consumption demand is a function

of income. That is, C=f(Y). As income increases, consumption expenditure increases and vice versa. In figure 4.2, C-line represents consumption function. It is a positively sloped line, indicating positive relation between income and consumption expenditure. I is the autonomous investment expenditure line. Autonomous means independent of income, and because of this independency, I-line is parallel to the income axis. I-line represents demand for producer goods. The gap between C and C+I is defined by the investment represented by the I line. C+I line shows aggregate demand, comprising consumption and investment demand. It reveals planned or intended expenditure at different levels of income.

Figure 4.2: Equilibrium Level of Output, Employment



4.5.3 Aggregate Supply Function

Aggregate supply function represents different amounts of money which the entrepreneurs must get from the sale of output at varying levels of employment. Or, in other words, it represents different levels of income (and thus output and employment) which the entrepreneurs will supply at different levels of expenditures (C+I). This has been shown in Figure 4.2.

In Figure 4.2, SS-line (45^0) represent the aggregate supply schedule. It indicates that at a given level of expected total expenditure (C+I), exactly equal level of total income will be offered. In the short run, aggregate supply function in an economy is fixed and given. It cannot be changed.

4.5.4 Equilibrium Level of Income and Output

The interaction between aggregate demand and aggregate supply functions determines the level of effective demand. In figure 4.2, point E_o is the point of effective demand. Equilibrium level of income is Oy_o. At this level, total income is equal to total expenditure, that is, Y=C+I. Here, equilibrium level of income OY_o, as represented by the condition Y=C+I does not necessarily indicate a full employment level of national income and output. Thus, equilibrium is possible at a less than full employment level. According to Keynes, in a capitalist economy, investment is generally inadequate to fill the gap between income and consumption. And as aggregate supply function is given in the short period, Keynesian theory of income determination may be more properly called the theory of aggregate demand.



CHECK YOUR PROGRESS

Q 4: State whether the following statements are true(T) or false (F)

(a) Keynes theory is applicable only in the long-run. (T/F)

(b) Aggregate Demand Function is inversely proportional to different levels of employment.(T/F)

Q 5: What is effective demand? (Explain in 40-50 words)

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Q 6: What is aggregate supply function? (Explain in about 50-60words)

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4.6 RELEVANCE FOR DEVELOPING COUNTRIES

Keynes was primarily concerned with the problems of economically advanced countries. The General Theory is not general in the sense that it is applicable in all places and at all times. Economists Harris, Schumpeter etc. were also of the view that neither Keynesian problems, nor Keynesian theory, nor Keynesian policy has relevance to the conditions prevailing in the underdeveloped countries.

Keynes was concerned with the problem of unemployment of developed countries. In those countries the nature of the problem of unemployment is quite different from that of developing countries. In the advanced countries, unemployment is due to the deficiency of effective demand. As income and output increase, consumption expenditure does not increase at the same rate because of low marginal propensity to consume (MPC) and high Marginal Propensity to Save (MPS). Investment is also inadequate and uncertain because of its dependence on future expectations.

In underdeveloped economies, the problem of unemployment is not due to deficiency of demand (as that of developed countries), but is due to inadequate supply. In these countries, millions of people live below poverty line and these people are unable to satisfy even the bare necessaries of life. Thus, there is a state of chronic unemployment which is due to very low level of income and low capacity to produce. As a result, these countries enter into the vicious circle of poverty. Thus, the problems before underdeveloped countries are:

- to raise the economy from low level of income and not of maintaining it at a higher level
- to give employment to increase the supply of goods and not just to increase expenditure
- to increase capacity to produce and not to utilize the existing excess capacity.

4.7 CRITICISMS

Keynes' General Theory revolutionized and brought radical changes in economic thinking of the classical era. His most important contribution in determination of income and employment is his idea of unemployment equilibrium. Another revolutionary contribution of Keynes was his criticism of the classical view that wage reduction, by lowering cost of production, increase employment and income. He pointed out the adverse effect of wage reduction on income and hence on aggregate demand, employment and income. Moreover, Keynes presented a general theory, dealing with all kinds of situations, that is, full employment, less- than -full employment and more-than full employment. The classical special theory dealt with only full employment situation. Moreover, Keynes made employment theory more practical by recognizing the necessity of government intervention (though autonomous investment) in restoring economic stability, increasing income and employment.

However, in his formulations, Keynes retains many of the classical assumptions. Perfectly competitive market condition with rationality principle (profit maximizing producers) of the classical theory also continues to exist in Keynes analysis. Use of marginal analysis, a static economic condition with a given population, existing state of technology and equipment and organizational set-up continues to exist in Keynesian theory of income determination.

A.C. Pigou, the remarkable neo-classical economist challenged underemployment equilibrium of Keynes. According to Pigou, during depression, as demand is deficient, wages, price as well as income and employment falls. Due to fall in price, purchasing power of people holding money increases. Thus, they become better off and actually buy more than they did before. This rise in demand will stimulate output and thus takes the economy to the full employment level. Thus, there exists an automatic adjustment mechanism in the economy as classical thinkers believed. Don Patinkin was also of the view that full employment is attainable when there is flexibility of wages and prices under static conditions. According to

Patinkin, money wages tend to fall during a situation of excess labour supply. This will reduce costs, and thereby lowers prices. Falling prices increase the real value of cash-balances, which, in turn, increase the demand for output and ultimately the economy reaches towards full employment level.



CHECK YOUR PROGRESS

Q 7: State whether the following statements are true (T) or false (F)

(a) Keynesian theory is well applicable in developing countries. (T/F)

(b) Developing countries have very high propensity to consume. (T/F)

Q 8: What is the nature of unemployment in developing countries? (Explain in 40-50 words)

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4.8 LET US SUM UP

- According to Keynes,
  - Ø Equilibrium level of income and employment does not mean full employment equilibrium level.
  - Ø Wage cut will definitely decrease demand and hence national income, and employment.
- Keynesian framework states that:
  - Ø Both income and output proceed hand in hand as employment increases.
  - Ø The level of employment depends on effective demand and unemployment arises due to deficiency of effective demand.

- Ø Effective demand depends on aggregate demand and aggregate supply functions.
- Ø Aggregate supply function represents different amounts of money which the entrepreneurs must get from the sale of output at varying levels of employment.
- Ø Aggregate supply function is fixed in short period.
- Ø Aggregate demand function represents maximum sale proceeds which the entrepreneurs expect to get from the sale of output at varying levels of employment.
- Ø Aggregate demand comprises of consumption demand and investment demand.
- Ø Consumption demand depends on the level of income and propensity to consume.
- Ø Investment demand is governed by marginal efficiency of capital.
- Ø Keynesian theory is not applicable in underdeveloped economies.



4.9 FURTHER READING

1) Ahuja, H.L. (2007). *Macroeconomics: Theory and Policy,* New Delhi: S.Chand& Co.
2) Keynes J.M. : *"The General Theory of Employment Interest and Money"* (1936).
3) Rana, K.C.&Verma, K.N. (2009). *Macro Economic Analysis.* New Delhi: Vishal Publishing Co.
4) Shapiro, E.(1988). *Macroeconomic Analysis,* New Delhi: Galotia Publications pvt. Ltd



4.10 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: (a) True (b) False

Ans to Q No 2: According to Keynes, it requires time for conversion of savings into investment. Thus, saved part of income is not automatically and instantly invested as believed by classical economists. A low level of investment demand lowers aggregate

demand, which is comprises of consumption demand and investment demand. Further, employment, output and income also declines.

Ans to Q No 3: The rate of interest is determined by demand for and supply of money. Demand for money is the liquidity preference. Liquidity preference means desire to hold cash in hand. People prefer to hold cash for three reasons: to meet day-to-day transactions, to meet contingencies and make future profits out of financial investment. Out of these three, the third one (speculative demand for money) has strong bearing on interest rate. The supply of money is fixed by monetary authority and, therefore, it is interest in-elastic.

Ans to Q No 4: (a) False (b) False

Ans to Q No 5: The effective demand is the point of interaction between aggregate demand function and aggregate supply function. It represents a state of employment where the aggregate demand price equals aggregate supply price. In other words, it is the point where what the entrepreneurs expect to receive equals what they must receive and their profits are maximised.

Ans to Q No 6: Aggregate supply price denotes the minimum proceeds which the entrepreneurs must expect to recover from the sale of the output at a given level of employment. Assuming labour to be the only factor of production, aggregate supply schedule represents varying levels of aggregate supply prices at different levels of employment, when money wage rate remains unchanged.

Ans to Q No 7: (a) False (b) True

Ans to Q No 8: Poor and developing countries mainly suffer from vicious circle of poverty. People have low purchasing power and a major portion of income is spent on consumption. In these countries, low saving and hence low investment, low labour productivity due to primitive techniques and training, limited size of market, high rate of population growth, strong propensity to divert investible resources on conspicuous consumption etc. all operate together. Under such

a situation, aggregate supply function becomes inelastic. Thus unemployment problem is of chronic in nature, not of cyclical like the developed countries.



4.11 MODEL QUESTIONS

A) Short Questions (Answer each question in about 150 words)

Q 1: What is the impact of the policy of wage-cut according to Keynes?

Q 2: How can aggregate demand function be derived?

Q 3: How the point of Effective Demand can be derived?

Q4: How far Keynesian prescription of raising aggregate demand is relevant in developing countries?

B) Essay-type Questions (Answer each question in about 300-500 words)

Q1: Make a comparative analysis of Keynesian and Classical Theory of Determination of Income, Output and Employment.

Q2: "The interaction of aggregate demand and aggregate supply functions determines the equilibrium level of output and employment." Discuss.

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UNIT 5: CONSUMPTION FUNCTION

UNIT STRUCTURE

5.1 Learning Objectives

5.2 Introduction

5.3 Keynes' Psychological Law of Consumption

5.4 Implications of Psychological Law of Consumption

5.4.1 Limitations of Keynes' Consumption Function

5.5 Empirical Evidence on Consumption Function

5.6 Let Us Sum Up

5.7 Further Reading

5.8 Answers to Check Your Progress

5.9 Model Questions

5.1 LEARNING OBJECTIVES

After going through this unit, you will be able to-

- explain Keynes' Psychological Law of Consumption in a systematic way
- discuss the implication of Keynes' Psychological Law of Consumption
- elaborate the empirical evidence on Consumption function.

5.2 INTRODUCTION

In the earlier unit 4, we have discussed about the Keynesian theory of income determination, from which you have come to know how equilibrium income and employment is determined in an economy with the interaction of aggregate demand and supply function. It is clear from the Keynesian aggregate demand approach that there exists an important relationship between the various component of aggregate demand and income. In this unit we shall thoroughly discuss on the relationship between income and consumption expenditure from Keynesian perspective.

5.3 KEYNES' PSYCHOLOGICAL LAW OF CONSUMPTION

John Maynard Keynes in 'The General Theory of Employment, Interest and Money' (1936) proposed the psychological law of consumption to capture the essential spending behavior of the household sector. It forms the basis of the Keynesian consumption function. Hansen calls it an 'epoch-making contribution' to the tools of economic analysis.

The essence of the law is that consumption varies directly with income but the change in consumption is of a smaller magnitude than that of change in income. In his words, "The psychology of the community is such that when aggregate income increased, aggregate consumption is also increased but not so much as income". In other words, the law states that marginal propensity to consume (MPC), given by the ratio of change in consumption to change in income $\left(\frac{\Delta C}{\Delta Y}\right)$, is greater than 0 but less than 1. The law thus implies that there is a tendency on the part of the people to spend on consumption less than full increment of income. Consequently, the saving gap goes on widening as income increases.

Keynes psychological law consists of three related propositions, which are as follows:

(1) When income increases, consumption expenditure also increases, but relatively in a smaller amount. The reason is that as income increases, our wants are satisfied side by side, so that the need to spend more on consumer goods diminishes. It does not mean that the consumption expenditure falls with the increase in income. In fact, the consumption expenditure increases with increase in income but less than proportionately. This proposition leads to a conclusion that MPC is less than unity.

Symbolically,

$$\Delta C < \Delta Y$$

$$\frac{\Delta C}{\Delta Y} < \frac{\Delta Y}{\Delta Y}$$

$$\frac{\Delta C}{\Delta Y} < 1$$

$$\text{Or } MPC < 1 \left[\text{Since, } \frac{\Delta C}{\Delta Y} = MPC \right]$$

(2) The increased income will be divided in some proportions between consumption expenditure and savings. This follows from the above proposition because when the whole of increased income is not spent on consumption the remaining is saved. In this way consumption and saving move together.

This proposition can be expressed as:

$$\Delta Y = \Delta C + \Delta S \rightarrow \frac{\Delta C}{\Delta Y} + \frac{\Delta S}{\Delta T} = 1 \rightarrow MPC + MPS = 1$$

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

Assumptions: Keynes' fundamental law of consumption rests upon the following main assumptions:

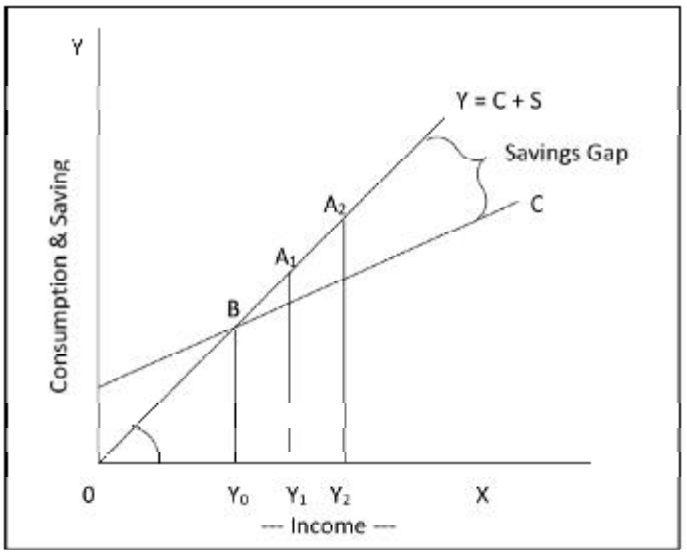
(1) Keynes assumes that psychological and institutional factors remain constantin the short run.Hence the MPC is said to remain constant. Based on this, the law suggests that consumption function is stable in short period and that consumption is the function of income alone.

(2) This law assumes normal peace-time conditions in a country.

(3) This law also rests upon the assumption that the country is advanced and that there is capitalistic system under which all the economic decisions are taken by the private consumers and producers.

The Keynesian fundamental Psychological law of consumption gives rise to a consumption function that is linear, non proportional and short run. It should also be noted that income in the consumption function refers to the current disposable income alone. The diagrammatic representation of the Keynesian consumption function has been shown in Figure 5.1:

Figure 5.1: Keynesian Consumption Functon



In Figure 5.1, income has been measured horizontally and consumption in the vertical axis. C is the consumption function and 45^0 line represents income. When income increases from OY_0 to OY_1, consumption also increases from BY_0 to C_1Y_1. But the increase in consumption is less than the increase in income. When income increases to OY_1 and OY_2 it is divided in some proportion between consumption C_1Y_1 and C_2Y_2 and saving A_1C_1 and A_2C_2 respectively.

Increase in income to OY_1 and OY_2 lead to increased consumption $C_2Y_2 > C_1Y_1$ increased savings between $A_2C_2 > A_1C_1$ than before. It is clear from the widening area below the curve C and savings gap 45^0 line and C curve.



CHECK YOUR PROGRESS

Q 1: Why according to the Keynesian psychological law of consumption, the gap between income and consumption increases over a period of time? (Answer in about 40 words).

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5.4 IMPLICATIONS OF KEYNES' LAW OF PSYCHOLOGICAL CONSUMPTION

On the assumption that consumption depends mainly on income, with that stable consumption function as given, some theoretical and policy implications of Keynes' Law of Psychological Consumption may be drawn briefly:

- **Crucial importance of Investment:** If people tend to spend less than the increment of income when output and employment increase, the increased output and employment will be unprofitable, unless investment increases to fill the gap between income and consumption. If investment fails to increase, output and employment inevitably falls, unless the consumption function rises to wipe out the gap between income and consumption.

  Given a stable consumption function, income employment fluctuations must be sought in the instability of investment. Thus Keynes' stress on investment as the crucial and initiating determinant of the levels of income and employment presumes the difficulty of raising the consumption function in the short period or a failure of consumption function to rise automatically under laissez faire.

- **Possibility of General Overproduction:** Another relevant implication of Keynes' law is that there can be general overproduction and mass unemployment. The classical theorists ruled out the possibility of general over production and unemployment in the economy. But, Keynesian law of consumption refutes the classical view and argued that general over production and unemployment is possible since MPC is less than unity (MPC<1). If MPC<1, not all that is produced is taken off the market as income increases. Therefore, supply exceeds demand rather than creating its own demand. Thus it only creates a glut of goods and services and therefore general overproduction and mass unemployment.
- **Refutation of Say's law of Markets:** Keynes refuted J.B. Say's law of market, which states that supply creates its own demand. According to Keynes', as stated in the earlier point, MPC<1 and therefore, people fail to spend all the income. As a result, there exist a savings gap, which creates a room for general overproduction. Therefore, supply fails to create its own demand. Thus Say's law of markets stands invalidated.
- **Declining Tendency of the Marginal Efficiency of Capital:** The expected rate of profit may collapse temporarily largely because the consumption function fails to rise to sustain consumption expenditure at a high level. Once the demand for capital goods has started to decline, there is little hope of raising the marginal efficiency of capital (MEC), given the propensity to consume remaining unchanged.

  Failure of the consumption function to rise would not lead to the collapse of the MEC, if consumption could be increased by increasing income. But, it is not possible to increase income without increased government spending. Under laissez faire, therefore, it is difficult to counter the declining tendency of the marginal efficiency of capital once the process has started, unless an automatic rise in the propensity to consume is to reverse that process. In longer periods, however, the MEC is affected by the autonomous factors
- **Under-employment Equilibrium:** Against the classical theorists notion of full-employment, Keynes' asserted that full employment equilibrium is only an exception. The economy has a tendency to be in equilibrium

at a less than full employment level. Since MPC<1, the aggregate demand function can not to such a high level as to intersect the aggregate supply function. In reality the intersection takes place at the more elastic part of the aggregate supply function and that position of equilibrium corresponds with a less than full employment situation.

- **Turning Points of Business Cycle:** Keynes' law also helps to explain the turning points of the business cycle. The traditional theories failed to provide a satisfactory explanation of the turning points of business cycles by postulating the inflexibility of credit policy or the absence or presence of production "bottlenecks".

  According to Keynes, the upper-turning point (boom to recession) and the lower turning point (from depression to recovery) both occur due to the fact that MPC is less than unity. As income increases, consumption expenditure also increases but by a smaller amount since MPC<1. Even if the income reaches the peak, consumption thereafter cannot rise further. Since the economy cannot stay continuously at the peak, the income starts falling. Thus the upper turning point of business cycle is caused by MPC being less than unity.

  Similarly, when there is contraction, income starts falling and consumption also falls, but again less than the income. A point is reached when the fall in income does not further involve in consumption and the economy reaches the lowest point. As the economy cannot stay continuously at the peak, similarly, it cannot stay continuously at the lowest point and recovery takes place in the economy. Thus the turning points of the business cycles are caused by the fact that MPC is less than unity.

- **Danger of Permanent Over-Saving Gap:** If the consumption function is not readily adjustable upward, there may be over-saving gap between the amount people wish to save out of full employment income and the volume of private investment business find profitable to maintain. The problem of offsetting a large amount of savings to maintain that full employment is due to the very nature of propensity to consume, i.e., MPC<1. The problem is complex in the sense that the possibilities for further investment may be completely autonomous with regard to the

level of income or the rate of interest. Moreover, there is neither certainty that autonomous factors will operate to expand investment in that degree which is necessary to fill the gap nor it can be assumed that public investment will increase to just such an extent so as the bridge the gap that private investment fails. A real solution may lie in the direction of raising the consumption function, but under laissez faire it seems to be a high hope.

- **Unique Nature of Income Propagation:** The marginal propensity to consume of less than unity also accounts for the unique way of explaining how initial injection of purchasing power into the income stream leads to an ultimate expansion of total income. Keynes' employed the concept of investment multiplier to demonstrate the multiple income propagation due to given increase in income.

  As we know, $k = \frac{1}{1 - MPC}$, where k is investment multiplier, the magnitude of k is determined by the extent by which MPC<1. Greater the value of MPC, larger is the size of k and income propagation and vice-versa.

- **Necessity of State Intervention:** Keynes' regarded the state intervention as absolutely necessary for ensuring economic stability in the advanced capitalistic economies. Since MPC<1, the saving gap goes on widening, making impossible to fill even by the private investors. In this connection, Keynes' suggested that government should fill the gap through public investment. Therefore, in the opinion of Keynes', the state intervention is absolutely necessary without which the problems like stagnation, depression, unemployment, etc. cannot be overcome.

- **Economic Policy:** According to Keynes the basic cause of depression and unemployment was MPC being less than unity. Therefore, he laid stress upon the policies to raise consumption such progressive taxation, stable wages, social security, cheap money policies, etc. Besides, Keynes also advocated the policies to expand private investment so that deficiency of consumption spending may be compensated through private investment.

From the above discussion, it is now clear that Keynes attacked both classical theories and policies through his psychological law of consumption and developed foundation for modern macro-economic theory and policy.

5.4.1 Limitations of Keynes'Consumption Function

Although Kenesian consumption function is admired by a number of prominent economists for several reasons, economists like Hazlitt and Hutt demonstrated certain weaknesses in it. Some of the major limitations are as follows:

- Hazlitt considered Keynes' consumption-income or saving-income relation as unrealistic. Keynes suggested that proportion of saving to income rises with rise in income. But some empirical studies found that this proportion may tend to fall with an increase in income.
- Keyenes' consumption function has been criticised due to unrealistic assumptions on which it was based. The assumptions such as the constancy of psychological and institutional complex, normal conditions and advanced capitalistic economic system can not hold valid in real life.
- Keynes' definition of the term 'propensity' refers a definite proportion of consumption to income. But Hazlitt objects the Keynes' interpretation of the term 'propensity', which according to him meant the 'tendency'. According to him, the tendency to consume of a commodity may or may not be in line with Keynes' analysis.
- Keynes has emphasised excessively on short term analysis of income-consumption relatioship. But Kuznet and several other economists pointed out that consumption income relationship is proportional, which was overlooked by Keynes'.
- Keynes in his consumption function pointed out that MPC is low in case of the rich, whereas it is high in case of the poor. According to Hazlitt, it was a mere truism as such a phenomenon was known to everybody.



LET US KNOW

- The psychological law proposed by John Maynard Keynes forms the basis of the consumption function. The essence of the law is that consumption varies directly with income but the change in consumption is of a smaller magnitude than that of change in income. Keynes psychological law consists of three related propositions, which are as follows:
  - When income increases, consumption expenditure also increases, but relatively in a smaller amount.
  - The increased income will be divided in some proportions between consumption expenditure and savings.
  - Increase in income always leads to an increase in both consumption and saving.
- Keynes Law of Psychological Consumption implies a major attack to the view of classical economists by refuting Say's Law of Market, showing a possibility of general over production and unemployment, equilibrium below the full employment level, etc. Besides, with this law Keynes' precisely explained the turning points of the business cycles.

5.5 EMPIRICAL CONSUMPTION FUNCTION

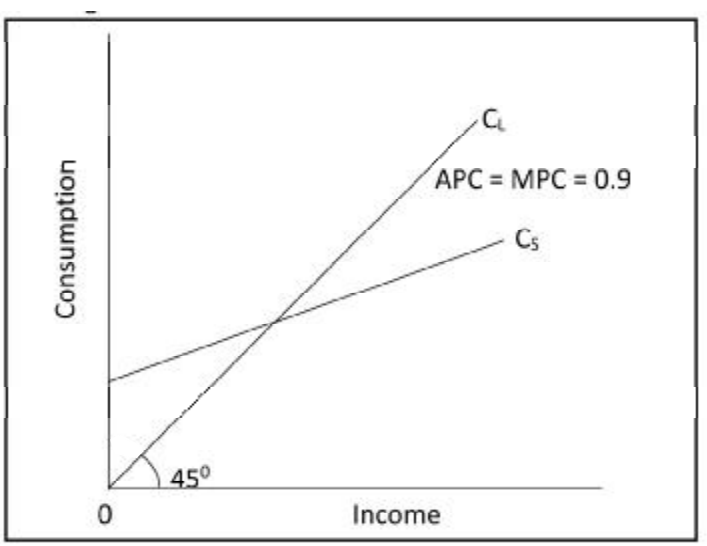
We have come to know that the Psychological Law of Consumption is a revolutionary contribution of Professor Keynes', which paved the way for some important macroeconomic discussion in the field of income and employment. But from late 1950s, the debate over the relationship between income and consumption became intensified with a number of empirical studies conducted by a number of economists such as, Kuznet, Tobin, Duesenberry, Friedman, Modigliani, Brumberg, etc.

Keynes' assertion that the APC falls as income rises led some Keynesians to formulate the secular stagnation thesis around 1940. According to these economists, as incomes grew in the economy, households would save more and consume less.As a result, aggregate demand would fall short of output. If the government spending were not increased at a faster rate than income, the economy would lapse into stagnation. However, after World War II, the American economy experienced inflation rather than stagnation even when the government expenditures were reduced below 1941 level in constant dollars.

In 1946, Kuznets studied the consumption and income data for the United States during the period 1869-1938 and estimated the consumption function for this period at APC=MPC=0.9. He arrived at two conclusions:

1) Over the long-run, on an average, the APC did not show any downward trend so that the MPC equaled the APC as income increased along a long-run trend.This means that the consumption function is a straight line through the origin, as shown by the CL line in Figure 5.2.

Figure 5.2: Long-run Consumption Function



2) The years in which the APC was below the long-run average were boom periods, and the years in which the APC was above the long-run average were of slump periods. This implies that in the short-run as income changes over the business cycle, the MPC is less than the APC, as shown by the Cs curve in the figure above.

Goldsmith later verified these findings in 1955, who found the long-run consumption function to be stable at 0.87. Thus these studies revealed that for the short-run time series, the consumption function is non-proportional because APC > MPC and for the long-run time series, the consumption function is proportional, APC = MPC.

The failure of the secular stagnation hypothesis and the findings of Kuznets and Goldsmith were a puzzle to the economists, which is known as the consumption puzzle. The above diagram explains this puzzle where there are two consumption functions. Cs is the Keynesian consumption function which is non-proportional (APC > MPC) and based on the short-run time series data.CL is the long-run proportional consumption function (APC = MPC) based on long-run time series data.

Over the years, economists have been engaged in solving this puzzle by reconciling the two consumption functions.The prominent among these attempts are the Relative Income Hypothesis, Life Cycle Hypothesis, and Permanent Income Hypothesis, which we would be discussing in the next Unit.



CHECK YOUR PROGRESS

Q 2: On what ground did Keynes turn down the Say's law of market? (Answer in about 40 words).

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Q 3: State the empirical finding of Goldsmith on the long-run income and consumption relationship. (Answer in about 40 words).

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5.6 LET US SUM UP

- Consumption function refers to a "functional relationship between total consumption expenditure and gross national income". Consumption is an increasing function of income. Consumption expenditure is a positive quantity despite income equals zero.
- Consumption function measures not only the amount spent on consumption but also the amount saved. This is because the propensity to save is merely the propensity not to consume.
- Consumption function has two technical attributes: Average Propensity to Consume and Marginal Propensity to Consume. By relation MPS+MPC=1 and APS+APC=1
- From the perspective of time consumption function is of two types- short-run and long-run consumption functions. The major point of difference between the two is that intercept is absent in long-run consumption function and therefore APC=MPC.
- Hansen calls Keynes' Psychological Law of Consumption as an 'epoch-making contribution' to the tools of economic analysis. The essence of the law is that consumption varies directly with income but the change in consumption is of a smaller magnitude than that of change in income.
- Through this law Keynes' has explained a number of macro-economic issues such as turning points of business cycles, possibility of general overproduction, refutation of Say's Law of Markets, under-employment equilibrium, necessity of state intervention, etc.
- The failure of the secular stagnation hypothesis and the findings of Kuznets and Goldsmith that for the short-run time series, the consumption

function is non- and for the long-run time series, the consumption function is proportional were remain a puzzle to the economists, which is known as the consumption puzzle.

5.7 FURTHER READING

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5.8 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: According to the Keynesian psychological law of consumption, increase in income always leads to an increase in both consumption and saving. However, the law states that as income increases consumption also increases but by a smaller amount than before which leads to an increase in saving. Thus, with increased income both consumption and saving increase. However, over a period of time, the gap between consumption and saving increases.

Ans to Q No 2: Keynes refuted J.B. Say's law of market, which states that supply creates its own demand. According to Keynes', as stated in the earlier point, MPC<1 and therefore, people fail to spend all the

income. As a result, there exist a savings gap, which creates a room for general overproduction. Therefore, supply fails to create its own demand. Thus, on this basis, Keynes, turned down the Say's law of market.

Ans to Q No 3: On further revalidation of Kuznets study, Goldsmith in 1955 found that the long-run consumption function is stable at 0.87. Thus,it was found that for the short-run time series, the consumption function is non-proportional because APC > MPC and for the long-run time series, the consumption function is proportional, APC = MPC.



5.9 MODEL QUESTIONS

A) Short Questions (Answer each question in about 150 words)

Q 1: Explain the concepts of average propensity to consume (APC) and marginal propensity to consume (MPC).

Q 2: Write a short note on Consumption Puzzle.

B) Essay-type Questions (Answer each question in about 300-500 words)

Q 1: Critically explain Keynes' psychological law of consumption.

Q 2: Explain the implication of Keynes' psychological law of consumption.

Q 3: Explain the consumption puzzle put forward by Kuznet.

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UNIT 6: THEORIES OF CONSUMPTION FUNCTION

UNIT STRUCTURE

6.1 Learning Objectives

6.2 Introduction

6.3 Absolute Income Hypothesis: Postulates

6.4 Relative Income Hypothesis

- 6.4.1 Ratchet Effect
- 6.4.2 Limitations of the Theory

6.5 Permanent Income Hypothesis

- 6.5.1 Concept of Transitory Income, Expenditure and Transitory Purchases
- 6.5.2 Equations of Permanent Income Hypothesis
- 6.5.3 Criticisms of Permanent Income Hypothesis

6.6 Life Cycle Hypothesis

- 6.6.1 Postulates of Life Cycle Hypothesis
- 6.6.2 Numerical Example
- 6.6.3 Criticisms of Life Cycle Hypothesis

6.7 Let Us Sum Up

6.8 Further Reading

6.9 Answers to Check Your Progress

6.10 Model Questions

6.1 LEARNING OBJECTIVES

After going through this unit, you will be able to-

- describe the concept of Keynesian absolute income hypothesis
- critically evaluate the arguments of absolute income hypothesis
- discuss the concept of relative income hypothesis
- point out the limitations of relative income hypothesis
- explain the equation of permanent income hypothesis
- put forward the shortcomings of permanent income hypothesis.

6.2 INTRODUCTION

There are several alternative explanations for the theory of consumption function. But the significant contribution in this regard comes from Keynes (Absolute Income Hypothesis), Duesenberry (Relative Income Hypothesis), Milton Friedman (Permanent Income Hypothesis), Modigliani &Brumberg and Ando & Modigliani (Life Cycle Hypothesis).

In recent years, permanent income hypothesis and life cycle hypothesishave become popular, and considered to be empirically sound while explaining consumption behavior. In this unit, we shall discuss some of the theories of consumption function. Thus, the unit will be helpful in gaining insights into the major theoretical discussions relating to the consumption function.

6.3 ABSULUTE INCOME HYPOTESIS: POSTULATES

The Absolute Income Hypothesis was put forward by John Maynard Keynes. The hypothesis is based on what Keynes called the Fundamental Psychological Law of Consumption.In the words of Keynes, "The fundamental psychological law upon which we are entitled to depend with grate confidence both a priori from our knowledge of human nature and from the detailed facts of experience, is that men are deposed, as a rule and on the average, to increase their consumption as their in income increases, but not by as much as the increase in their income".

Thus, this hypothesis is based on following postulates.

- Consumption is stable function of income.
- The marginal propensity to consume (MPC) is less than 1 but greater than zero.
- As income increases consumption also increases but less than proportionately. As a result, the average propensity to consume (APC) falls over time. This makes marginal propensity to consume (MPC) less than the average propensity to consume (APC).

Keynes holds the view that household's current consumption expenditure depends on the current income of the household. On the basis

of this fundamental argument, absolute income hypothesis builds its propositions that current consumption expenditure depends upon current and absolute level of disposable income.

$$C = \int(Y)$$

Where, C = current consumption, Y = current disposable income.

Following are the main features of Keynesian consumption function.

- The real consumption expenditure is a positive function of the real current disposable income.
- The marginal propensity to consume (MPC) ranges between zero and 1, that is 0 < MPC < 1 (0 and 1 excluded).
- The marginal propensity to consume (MPC) is less than the average propensity to consume (APC) that is, $\frac{\Delta C}{\Delta Y} < \frac{C}{Y}$
- The average propensity to consume (APC) declines as income increases.

Diagrammatic Presentation:

Figure 6.1: Absolute Income Hypothesis

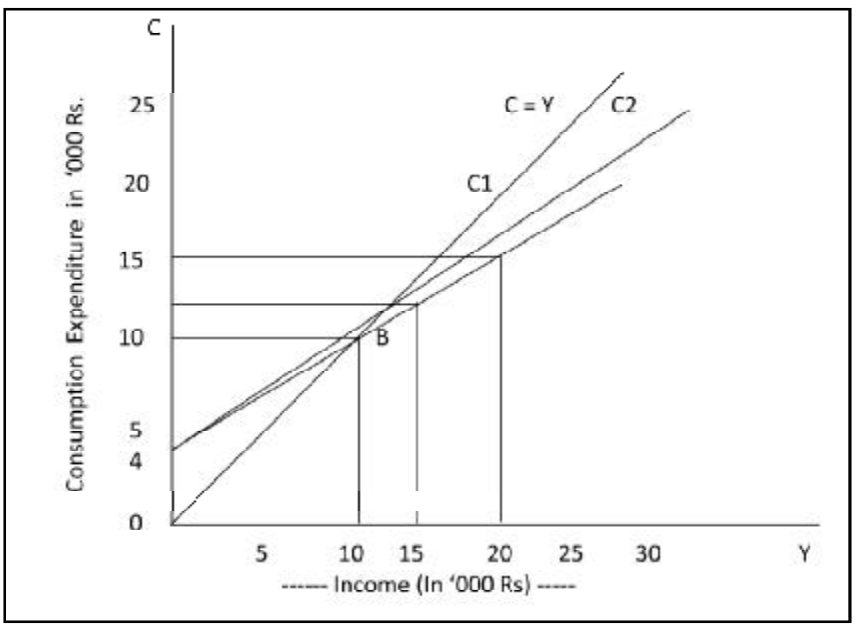


Illustration of diagram: In this diagram, the 450 line (C=Y) shows that consumption is always equal to current income. This is hypothetical example that shows that if Y = 0 then C = 0. This is not realistic proposition because even if income is zero, people consume by begging, borrowing and stealing.

Curve C1 shows Keynes's absolute income hypothesis. The curve shows that consumption expenditure exceeds the current income up to a certain level of income (say, Y = 10,000). The break-even point in this diagram is at B. Beyond the point B, consumption expenditure increases with increase in income but at a slower pace. As a result the slop of the curve C1 goes on diminishing with increase in income. Similarly, curve C1 is downward bending positive sloping income-consumption curve depicts the fact that low income households have higher marginal propensity to consume (MPC) and higher income households have lower marginal propensity to consume and result in the downward bending positive sloping income-consumption curve.

The straight-line consumption function in the above form narrates absolute income hypothesis of Keynes.

$C = a + bY$ ……(1)

Where, 'a' is an intercept showing consumption at zero level of income, which is called the autonomous consumption, and 'b' stands for

$$MPC = \frac{\Delta C}{\Delta Y}$$

This consumption function represented by the consumption schedule labeled C2 in the diagram. The consumption schedule C2has constant slop that is given by b in the above equation (1).

Criticism of the absolute income hypothesis:

- Absolute income hypothesis is based more on 'introspection' rather than observed facts.
- Empirical studies have found that consumption expenditure depicts proportionality with income in time series data for a longer period, while it shows non proportionality for short period as well as in case of cross section data. This contradicts the Keynesian hypothesis as it asserts a non proportional relationship between income and consumption.

In view of the failure of the Absolute Income Hypothesis to explain the empirical findings, a host of alternative explanations came up that attempt to reconcile the proportional and non proportional relationship of aggregate

consumption and aggregate disposable income. It is in this context we study the following alternative hypothesis, namely, Relative Income Hypothesis, Permanent Income Hypothesis, and Life Cycle Hypothesis.

6.4 RELATIVE INCOME HYPOTHESIS

The psychologist and sociologists have acknowledged that individuals care about their status in society. Duesenberry gives careful consideration to this postulate. He explained his relative income hypothesis in 1949 in a book title 'Income, Saving and Theory of Consumer Behavior'. In this bookDuesenberry argued the utility of an individual derived from given consumption level depends on its relative magnitude in society rather than its absolute level.

Dusenberry argued that utility index of an individual is depends on the ratio of his or her consumption to weighted average of the consumption of the others. It means that utility of an individual depends both on own income and income relative to others. Relative income hypothesis shows that people/households make their decisions regarding consumption and saving based not only on absolute income but on relative income as well. As a consumer, individual considers his income as it relates to the income of other before making purchase decisions.

Duesenberry, in his relative income hypothesis argued that if relative income of an individual remains same, the individual will spend the same proportion of his income on consumption as he was doing before the absolute increase in his income. In other worlds, average propensity to consume (APC) of an individual will remain same despite of the fact that his absolute income increases. Study conducted by Kuznets based on time-series has shown that in long run average propensity to consume remains almost constant. It means in long run the community would continue to consume the same proportion of income as its income increases.

So the exact difference between absolute and relative income hypothesis is as follows.

Keynesian absolute income hypothesis implies that as the absolute income of community increases, it will offer a smaller proportion of its income towards consumptions and as a result, APC will decline. On the contrary, relative income hypothesis implies that if the income of the community increases, and the relative distribution of income remains the same, then consumption would increase by the same proportion. Thus, therelative income hypothesis suggests that as income increases consumption function curve shifts above so that average propensity to consume remains constant.

Similarly, relative income hypothesis provides slightly different explanation from absolute income hypothesis on the question of what happens when household income decreases. On the one hand absolute income hypothesis holds the view that consumption decreases when there is decrease in income. On the contrary relative income hypothesis holds the view that consumption will not decreases in proportion to income because of 'Ratchet Effect'.

6.4.1 Ratchet Effect

When the income of individual falls, consumption does not fall as much, this is called Ratchet Effect. How this happens? This is because people are aware about position in the society they live in and they do not want to show the neighbors that they can no longer afford to maintain the previous standard of life.

James Duesenberry (1949) offers slightly different explanations to conventional argument. Conventionally, if income falls, then consumption should fall. But Duesnberry rejects this view. He argues that once the consumption habits are acquired, it becomes difficult to get rid of these habits. Some of the consumption habits are formed at high income levels that are not completely abandoned when income falls.

The ratchet effect arises due to household's resistance against the fall in consumption following a decrease in household income. Duesenbeerry argues that when absolute income increase absolute consumption also increases. But absolute income

decreases, the household do not allow their consumption to fall in their income. This is because, in a long run, household gets used to certain standard of living. Therefore, when income of these households falls, consumption of these households fall less then proportionally. When consumption does not falls in proportion to the fall in income, then average propensity to consume (APC) rises and marginal propensity to consume (MPC) falls. This is called ratchet effect in consumption behavior.

Let's understand with suitable example-

If the income of household increases from Rs. 10,000/- per unit of time to Rs. 11,000/-. The consumption of household would increases from Rs. 8000/- to Rs. 8800/-.

In this case, $\text{MPC} = \frac{\Delta C}{\Delta Y} = \frac{800}{1000} = 0.80$ and

$$\text{APC} = \frac{C}{Y} = \frac{8800}{11000} = 0.80,$$

$$\text{Here, MPC} = \text{APC} = 0.80$$

But when the income decreases, say to Rs.9000/-, consumption decreases less then proportionally to say, Rs. 7500. In this case

$$\text{MPC} = \frac{\Delta C}{\Delta Y} = \frac{500}{1000} = 0.5$$

$$\text{And, APC} = \frac{C}{Y} = \frac{7500}{9000} = 0.83$$

Note that MPC has decreased from 0.8 to 0.5 and APC has increased from 0.8 to 0.83.

Diagrammatic Presentation: Duesenberry's consumption function has been shown with the help of Figure 6.2

Figure: 6.2: Duesenberry's Consumption Function

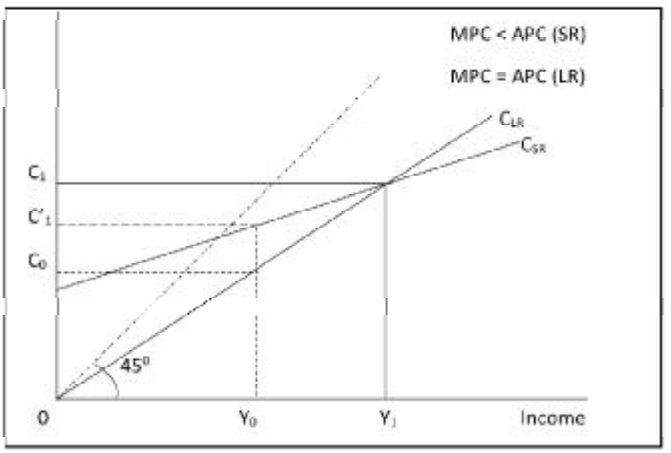


Figure 6.2 shows the fundamental framework of relative income hypothesis by Duesenberry. OX is a horizontal axis showing income and OC is vertical axis showing level of consumption corresponding to the level of income. In this diagram, if long run consumption increases as a result of increase in income is shown as C_{LR}.

When income is OY_0, aggregate consumption is OC_0. As the income increases to OY_1, consumption rises to OC_1. This means a constant APC consequent upon a steady growth of national income.

Now, let's assume that income levels falls from OY_1 to OY_0. In these circumstances, Duesenberry's hypothesis comes in operation and it's visible. For example, household will maintain the previous cons8umption level what they enjoyed the past peak of income levels. It means households are unwilling to reduce their consumption standards along with C_{LR}. Consumption will not decline to OC_0, but will remain at OC'_1 ($>OC_0$) at the income level OY_0. At this level of income, APC will be higher than what it was at OY_1 and MPC will be lower.

If income rises, consumption will rises along C_{SR} because people will maintain their consumption standard at the previous peak income. Once OY_1 level of income is reached consumption will move

along with C_{LR}. The short run consumption is subject to 'the ratchet effect'. If ratchets up following an increases in income levels, but it does not fall back downward in response to fall in income.

6.4.2 Limitations of the Theory

The major criticisms levelled against the relative income hypothesis are:

- Ø The relative income hypothesis states that income and consumption would increase upward whether the change in income is small or large. But empirical data shows that large increase income has not resulted in large increase in consumption.
- Ø Relative income hypothesis also states that consumption standards are irreversible. But this argument is true for short run. The consumption standards are reversible in the long run.
- Ø The relative income hypothesis states that income and consumption changes always in the same direction. It means that recession must always be accompanied by fall in aggregate consumption expenditure. There is evidence during 1948 recession in the U.S., consumption expenditure was rising while disposable income was decreasing.
- Ø This hypothesis ignores other factors which influences consumer expenditure like- asset holding, urbanization, age composition, appearance of consumer goods etc.



CHECK YOUR PROGRESS

Q 1: State the basic difference between absolute and relative income hypotheses. Answer in about 60 words.

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Q 2: What is meant by the Ratchet effect? Answer in about 60 words.

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6.5 PERMANENT INCOME HYPOTHESIS

The Permanent Income Hypothesis was formulated by a Nobel Laureate Milton Friedman in 1957. Earlier, both absolute and relative income hypothesis related consumption to absolute and relative current income. But Milton Friedman in his book 'Theory of Consumption Function' rejected the argument of current income hypothesis and formulated a new theoretical framework to understand consumption function. This theoretical framework is known as 'Permanent Income Hypothesis'. Permanent income is the mean of all the incomes anticipated in the long run. While calculating permanent income, Friedman says that it is an income anticipated from human and non-human wealth. Income from human wealth refers to income from human capital that includes training, education, skill and intelligence. In short, income from human capital is the income earned by selling the household labour. On the other hand, income from non-human wealth means income from assets like- money, stocks, bonds, real estate and consumer durables etc.

In short, this theory can be stated that it is the permanent income and not current income that determines the level of consumption expenditure. Permanent income hypothesis also provided explanations for some of the issues that rose from the empirical data regarding the relationship between average and marginal propensity to consume.

6.5.1 Concepts of Transitory Income, Transitory Expenditure and Transitory Purchase

While calculating permanent income, we need to understand and distinguish between transitory income and transitory expenditure. Transitory income consists an income earned by people in the form of bonus to workers, lottery wins etc. Similarly, transitory losses consists of unpaid sick leave, temporary loss of job, non-payment of wages due to strikes and lockouts, short term fall in returns on the income earning assets etc.

Similarly, there is need to understand the concept of transitory purchases along with transitory income and expenditures. Sometime households make once in a while purchase of goods which they do not need for immediate consumption. These types of purchases are made because of attractive offers, anticipated scarcity of the commodity etc. But at the same time some routine purchases are postponed by households due to lack of funds, sudden price rise or lower prices expected in the future. The purchases that are deferred by households are treated as negative transitory purchases. The permanent income hypothesis assumes no relationship between income and transitory purchases made or postponed.

While estimating permanent income of household, the transitory income is considered as an addition while transitory expenditure is considered as a loss from the permanent income.

6.5.2 Equations of Permanent Income Hypothesis

While elaborating permanent income hypothesis, Dornbusch and Fischer said that Friedman has not provided a standard definition of permanent income. But certainly he has given a pragmatic approach to estimate permanent income. Further, they also said that permanent income was equal to geometrically weighted average of present and past measured income.

Friedman's theory of permanent income hypothesis is very significant and has opened new areas of research on saving and consumption function. Friedman believes that every household has some conception of his future expected income that is considered to be stable. This is called permanent income.

The actual income of the household may or may not coincide with permanent income. The gap between measured income and permanent income are called transitory income which may be negative or positive.

Thus, we have the following identity.

$Y_m = Y_p + Y_{tr}$ …… (1)

It means that measured income consists of permanent income and transitory income. While defining permanent income, Friedman said that 'the effect of those factors that the unit regards as determining it's capital value of wealth; the non-human wealth, personal attributes of earners like his training, ability, personality, the attributes of the economic activities of the earners and so on.

Besides, transitory component of income, on the other hand, reflects the effect of 'change' or accidental factors which causes the measured income to rise or fall temporarily. In fact, income earned through such windfall gains is temporary and consumer knows it. As a result, consumer will not base his consumption upon such transitory income. In fact, consumer would base his consumption upon what he considers as his permanent income.

Algebraically, permanent income hypothesis can be written as:

$C_p = kY_p$ ……(2)

: Permanent consumption (C_p) equals k proportion of permanent income (Y_p)

$Y_m = Y_p + Y_{tr}$ ……(3)

: Measured income (Y_m) equals permanent income (Y_p) plus transitory income (Y_{tr})

$C_m = C_p + C_{tr}$.....(4)

:Measured consumption (C_m) equals permanent consumption (C_p) plus transitory consumption (C_{tr})

$R_1 (Y_{tr} Y_p) = 0$ .....(5)

: Correlation coefficient (R_1) between Y_{tr} and Y_{pe} quals zero

$R_2 (C_{tr} C_p) = 0$ .....(6)

: Correlation coefficient (R_2) between C_{tr} and C_{pe} quals zero

$R_3 (Y_{tr} C_{tr}) = 0$ .....(7)

: Correlation coefficient (R_3)between Y_{tr} and C_{tr} equals zero

These equations explain permanent income hypothesis. For example-equation-1 states that permanent or planned consumption a certain proportion (k) of the permanent income. The proportionality factor k need not be a constant for it depends on demographic and ethnic factors, the interest rate and ratio of non-human wealth to permanent income.

Friedman estimated permanent income on the basis of measured income data for 17 years. The formula that he used to measure the permanent income is given below.

$$Y_{pt} = \beta Y_t + \beta(1-\beta) Y_{t-1} + \beta(1-\beta^2) Y_{t-2} + ...\beta(1-\beta)^n Y_{t-n} .....(8)$$

Where,

Y_{pt}= permanent income in periodt

β = rate of declining weightage for the annual measured income in the past

In Friedman's own estimate of permanent income, β =0.33.

In equation 8, the permanent income of a household in any year (say, t) can be easily obtained by summing up a declining percentage of incomes in the past years, t, t_{-1}, t_{-2} and so on. For example, assuming β =0.33, the permanent income of household for 1998 can be obtained as follows.

$Y_{199}8 = (0.33)\ Y_{1998} + 0.33\ (1\text{-}0.33)\ Y_{1997} + 0.33\ (1\text{-}0.33)2\ Y_{1996} + 0.33\ (1\text{-}0.33)3\ Y_{1995}$ and so on ……(9)

$= (0.33)\ Y_{1998} + 0.22\ Y_{1997} + 0.148\ Y_{1996} + 0.10\ Y_{1995}$ and so on

In short, the measured permanent income for 1998 equals 33 per cent of 1998 income plus 22 per cent of 1997 income plus 14.8 per cent of 1996 income plus 10 per cent of 1995 income, and so on.

6.5.3 Criticisms of Permanent Income Hypothesis

The major criticisms levelled against the permanent income hypothesis are:

- Permanent income hypothesis assumes that the coefficient of correlation between transitory component of consumption and transitory component of income is zero. This is not real. For example- an individual who gained a profit is not willing to deposit his money in bank but would like to spend a whole or part of it in his current consumption. At the same way an individual who suffered losses does reduce or postpone his current consumption.
- This theory also assumes that average propensity to consume of all households remains same in long run. This does not hold true because consumption of poor is higher relatively to their income while the saving of the rich is higher relatively to their income. Even consumption differs among the person with same level of permanent income.

- It seems that the concept of measured income creates confusion by bringing permanent and transitory component of income.



CHECK YOUR PROGRESS

Q 3: How can one estimate permanent income? Answer in about 60 words.

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Q 4: Mention any two important criticisms levelled against the permanent income hypothesis. Answer in about 60 words.

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6.6 LIFE CYCLE HYPOTHESIS

The theory of life cycle hypothesis is associated with economist like Franco Modigliani, Richard Brumberg and Alberto Ando. Given the wealth constraint, life cycle hypothesis aims to maximize the utility function over the life span. The maximization of utility function depends upon the availability of resources. The resource pool of an individual consists of his current and discounted future earning over his life span and current net

worth. Modigliani won Nobel prizein Economics in year 1985 for his work on life cycle hypothesis.

This hypothesis explains the conflict between average propensity to save (APS) from cross section data and data from time series.

Life cycle hypothesis assumes that an individual earns relatively low income at the beginning and at the end of his life. But the flow of income remains high during the middle of his life. The individual maintains increasing level of consumption in his entire life. But the present value of his total consumption would not exceed the present value of total income during his life time.

The life cycle hypothesis also observes that in order to avoid the fluctuations in income, people save their income especially during the high income and dissave during the time of low income. If the probability of future income increases, consumption also increases.

The life cycle hypothesis also suggests that an individual is a net borrower at the earlier stage of his life. During the middle of his life, individual save more and also puts aside a sum for his retirement. In the later years, a person will dissave and consumer more than his income.

In life cycle hypothesis individual smoothen out the consumption pattern in the lifetime and this process has independent of current level of income.

Life cycle hypothesis states that early stage of life of an individual, consumption expenditure is likely to exceed income. Because individual may purchase a new home to start his family life at eh initial stage of his career. In order to support these consumption need, individual is likely to borrow from future.

In the mid-career life, individual's income increases. Individual is in a position to repay and of his past borrowing and also begins to save for her/ his retirement. At the stage of retirement, consumption expenditure may decline but decline in income is more drastic. At the retirement stage of life, the individual is dis-saver.

While highlighting the pattern of consumption behavior of an individual, the life cycle hypothesis emphasise on three factors, viz.:

1. Availability of resources to the individual.
2. Rate of return on his capital
3. The age of an individual

The availability of resources with an individual consists of individuals existing net wealth and the present value of all current and future labour income. Consumer is rational; this is one of the crucial assumptions of life cycle hypothesis. In order to maximize the total utility over life time, a rational consumer plans his/her consumption on the basis of resources, allocation of income and consumption.

6.6.1 Postulates of Life Cycle Hypothesis

Total consumption of an individual is determined by current physical and financial wealth and life timelabour of an individual.

The consumption expenditure of an individual depends upon life time income and stock of wealth.

Life-time consumption pattern of an individual remains more or less stable.

There is no relationship between current income and current consumption.

The postulate No. 1 & 2 will pave the way for life-time consumption.

$C = aW_R + cY_L$.....(1)

Where, W_R= real wealth, Y_L= labour income, a = mpc wealth income, and c= mpclabour income.

Now let's assume that an individual starts working at the age of B, and this individual wants to live for N years with his retirement age at R. Therefore, his working life equals R-B years.

Let's also assume that: 1. Individual has no uncertainty about his longevity, employment and health condition. 2. He earns no interest on his accumulated savings. 3. He does not consume his total labour income 4. Prices remain constant.

Taking in to considerations of the following assumptions, the lifetime income is estimated as follows:

Lifetime income = Y_L (R - B)

Where, Y_L = annual labour income, and R-B = number of working years.

Assuming R-B = E_L to the earning life, we may redefine lifetime labour income as lifetime income = Y_L X E_L.

Life-cycle hypothesis states that an individual plans his lifetime consumption in such as way that his lifetime consumption equals his lifetime income. Here the term 'lifetime' means working life = N -B. Given the individual's expected life of N years and his planned constant (annual) consumption (C), the consumption hypothesis can be written as-

C X N = Y_L X E_L……(2)

Let's divide both the sides by N, we get the lifetime consumption (C) as

$$C = \frac{EL}{N} XYL \quad \text{.....(3)}$$

Equation (3) reveals that not only a fraction of labour income is consumed annually and the rest is saved and accumulated. We will return to the savings aspects shorts. Let us first explain the life-cycle hypothesis through a numerical example in Indian context.

6.6.2 Numerical Example

Let's assume and calculate consumption-saving pattern according to life cycle hypothesis:

Life expectancy (N) = 70 years.

Retirement age of an individual (R) = 60 years.

Age at the beginning of working life: 18 years.

Working life (R-B) = E_L = 40 years.

Annual income of an individual: Rs. 5,00,000/-

On the basis of these assumptions:

Lifetime income = YL X EL = Rs. 5, 00,000 X 42 = Rs. 2, 10, 00000/-

$$C = \frac{EL}{N} XYL = \frac{42}{60} X5,00,000$$
$$= 0.7X5,00,000$$
$$= 3,50,000/-$$

In other words, an individual spends 70 per cent of his income on consumption and remaining 30 per cent income is saved and will be consumed after the retirement. Once we know the annual income and annual consumption, it becomes easy for us to calculate the annual saving of an individual.

S = Lifetime income - Working life consumption

= (Y_L X E_L) - (C X E_L)

= (5, 00,000 X 42) - (3, 50,000 X 42)

= 2, 10, 00000 - 1, 47, 00000

= 63, 00000/-

6.6.3 Criticisms of Life Cycle Hypothesis

The major criticisms levelled against the life cycle hypothesis are:

- Ø This theory is strongly criticized on the basis of the very assumptions of this theory. For example- this theory assumes that individual has definite vision and idea about his future income, life time income, future credits, future emergencies, opportunities and social pressures, etc. These assumptions are rather strong and unrealistic.
- Ø This theory assumes that individual is rational, he knows the entire market information he needs; individual can make fine and complex calculations about the future etc. It is difficult to assume that all individuals in the community really have this set of information while making decisions.



CHECK YOUR PROGRESS

Q 5: State the basic argument of the life cycle hypothesis. Answer in about 60 words.

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6.7 LET US SUM UP

- Absolute Income Hypothesis was put forward by John Maynard Keynes
- According to Keynes, consumption increases as income increases, but not at the way income increases. Keynes also holds the view that household's current consumption expenditure is depends on the basis of current income of the household.
- In short, Keynes has highlighted a fundamental psychological rule of any modern society that when its real income increased, it will not increase its consumption by an equal absolute amount, so that a greater absolute amount must be saved. Keynes also identified the subjective factors in decision making on saving.
- The psychologist and sociologists have acknowledged that individuals care about their status in society.
- Duesenberry argued the utility of an individual derived from given consumption level depends on its relative magnitude in society rather than its absolute level.
- Dusenberry argued that utility index of an individual is depends on the ratio of his or her consumption to weighted average of the consumption of the others.

- Duesenberry, in his relative income hypothesis argued that if relative income of an individual remains same, the individual will spend the same proportion of his income on consumption as he was doing before the absolute increase in his income.
- When the income of individual falls, consumption does not fall as much, this is called Ratchet Effect. The ratchet effect arises due to household's resistance against the fall in consumption following a decrease in household income.
- The Permanent Income Hypothesis was formulated by a Nobel Laureate Milton Friedman in 1957.
- Friedman says that it is an income anticipated from human and non-human. Income from human refers to income from human capital that includes training, education, skill and intelligence. In short, income from human capital is the income earned by selling the household labour. On the contrary, income from non-human means income from assets like-money, stocks, bonds real estate and consumer durables etc.
- The theory of life cycle hypothesis is associated with economist like Franco Modigliani, Richard Brumberg and Alberto Ando.
- Life cycle hypothesis assumes that an individual earns relatively low income at the beginning and at the end of his life. But the flow of income remains high during the middle of his life. The individual maintains increasing level of consumption in his entire life. But the present value of his total consumption would not exceed the present value of total income during his life time.
- The life cycle hypothesis also observes that in order to avoid the fluctuations in income, people save their income especially during the high income and dissave during the time of low income. If the probability of future income increases, consumption also increases.



6.8 FURTHER READING

1) Ahuja, H. L. (2007). Macroeconomics: Theory and Policy. New Delhi: S. Chand & Co.

2) Dwivedi, D. N. (2008). Macroeconomics: Theory and Policy. New Delhi: Tata McGraw-Hill Publishing Co. Ltd.
3) Gupta, R. D. & Rana, A. S. (2009). Keynes and Post-Keynesian Economics. Ludhiana: Kalyani Publisher.
4) Jha, R. (2008). Contemporary Macroeconomic Theory and Policy. New Delhi: New Age International (P) Ltd.
5) Kurihara, K. K. (1986). Monetary Theory and Public Policy. New Delhi: Kalyani Publishers
6) Rana, K. C. &Verma, K. N. (2014).Macro Economic Analysis. New Delhi: Vishal Publishing Co.
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6.9 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: The basic difference between absolute and relative income hypotheses is: the absolute income hypothesis holds that as the absolute income of community increases, it will offer a smaller proportion of its income towards consumptions and as a result, APC will decline. On the other hand, relative income hypothesis implies that if the income of the community increases, and the relative distribution of income remains the same, then consumption would increase by the same proportion.

Ans to Q No 2: According to the relative income hypothesis, when the income of individual falls, consumption does not fall as much. This is because people are aware about position in the society they live in and they do not want to show the neighbors that they can no longer afford to maintain the previous standard of life. This is called as the Ratchet effect.

Ans to Q No 3: While calculating permanent income, one has to consider both transitory income and transitory expenditure. Transitory income consists of: income earned by people in the form of bonus to workers, lottery wins etc. Similarly, transitory losses consists of unpaid sick

leave, temporary loss of job, non-payment of wages due to strikes and lockouts, short term fall in returns on the income earning assets etc.

It is to be noted that transitory income is the gap between measured income and permanent income and it can be either negative or positive.

Ans to Q No 4: Two major criticisms levelled against the permanent income hypothesis are:

- **Ø** It assumes that the coefficient of correlation between transitory component of consumption and transitory component of income is zero. This is not real.
- **Ø** The assumption that average propensity to consume of all households remains same in long run, does not hold good; because consumption of poor is higher relatively to their income while the saving of the rich is higher relatively to their income. Even consumption differs among the person with same level of permanent income.

Ans to Q No 5: Life cycle hypothesis assumes that an individual earns relatively low income at the beginning and at the end of his life. But the flow of income remains high during the middle of his life. The individual maintains increasing level of consumption in his entire life. But the present value of his total consumption would not exceed the present value of total income during his life time.



6.10 MODEL QUESTIONS

A) Short Questions (Answer the following questions in about 150 words)

Q 1: Discuss the concept of absolute income hypothesis.

Q 2: Draw the major distinctions between the absolute and relative income hypotheses.

Q 3: Discuss the concept of ratchet effect.

Q 4: Why hasthe theory of permanent income hypothesis been criticized?

B) Essay-type Questions (Answer the following questions in about 300-500 words)

Q 1: Critically evaluate the theory of life cycle hypothesis.

Q 2: Make a comparative assessment of the relative income hypothesis and the permanent income hypothesis.

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UNIT 7: INVESTMENT FUNCTION

UNIT STRUCTURE

7.1 Learning Objectives

7.2 Introduction

7.3 Investment

- 7.3.1 Meaning and Definition
- 7.3.2 Types of Investment

7.4 Marginal Efficiency of Capital

- 7.4.1 Meaning of Marginal Efficiency of Capital (MEC)
- 7.4.2 Determinants of Marginal Efficiency of Capital
- 7.4.3 Measurement of Marginal Efficiency of Capital
- 7.4.4 Marginal Efficiency of Capital (MEC) Schedule
- 7.4.5 Criticisms of Marginal Efficiency of Capital

7.5 Marginal Efficiency of Investment

- 7.5.1 Meaning of Marginal Efficiency of Investment (MEI)
- 7.5.2 Difference between of Marginal Efficiency of Capital (MEC) and Marginal Efficiency of Investment (MEI)
- 7.5.3 Marginal Efficiency of Investment Schedule
- 7.5.4 Investment and Rate of Interest

7.6 Factors Affecting Marginal Efficiency of Capital

7.7 Let Us Sum Up

7.8 Further Reading

7.9 Answers to Check Your Progress

7.10 Model Questions

7.1 LEARNING OBJECTIVES

After going through this unit, you will be able to-

- put forward the meanings of the terms 'Investment', 'Marginal Efficiency of Capital' (MEC) and 'Marginal Efficiency of Investment' (MEI)
- discuss different types of investment
- explain the determinants of Marginal Efficiency of Capital

- measure Marginal Efficiency of Capital and Marginal Efficiency of Investment
- analyse Marginal Efficiency of Capital Schedule and Marginal Efficiency of Investment Schedule
- make a distinction between Marginal Efficiency of Capital and Marginal Efficiency of Investment
- analyse relation between Investment and Rate of Interest
- discuss the factors that affect the Marginal Efficiency of Capital.

7.2 INTRODUCTION

In the fourth unit of the course,we have discussed about Keynesian theory of Income Determination. In the theory of Income determination, consumption and investment are the two major determinant of effective demand or employment or income or output in the economy. Of these two determinants, consumption function and different theories of consumption function are discussed in the 5th and 6th units respectively. From these discussions it is clear that consumption function remains more or less stable during short period. Therefore, increase in aggregate demand or expansion of employment or income or output can be ensured through an increase amount of investment in the economy. In the present unit, we are going to discuss about several issues related to investment.

7.3 INVESTMENT

As we have already stated, investment is a major determinant of effective demand. In this section, we shall try to derive the meaning of investment.

7.3.1 Meaning and Definition

In general, the term investment means allocation of money or some other resources in expectations of benefits in the future. The allocation of money may involve purchase of assets like lands, buildings, factories, machinery, plant and equipment, raw materials,

inventory stocks, shares and debentures of business corporation, government securities etc.

However, utilization of funds or resources for all kinds of assets does not signify real investment. Keynes uses the term investment to mean 'real investment' He clearly maintains a distinction between 'real investment' and 'financial investment'.

Financial investment is that investment which does not result in any increase in income, output or employment in the economy. For example, if resources are used for purchase of existing commercial and industrial firms or purchase of shares, bonds or securities of existing enterprises, such investment are termed as financial investment. This type of investment simply involves transfer of assets from one investor to another. That means there is only change of ownership. From the view point of the whole economy, transactions involving such sale or purchase of existing assets cannot be regarded as real investment, as it do not add anything to income, output or employment.

As stated earlier, Keynes uses the term investment to mean real investment. Real investment is that investment which results in net increase in income, output or employment. For example, if an entrepreneur uses his resources for construction of new building or for buying new plant and machinery or for purchase of shares and debentures of newly developed firms. It leads to addition to the existing stock of capital assets, which raises aggregate demand brining about changes in income, output and employment in the economy.

Definition of investment: Different economists have defined investment, i.e. real investment. We have discussed some of these definitions in the following:

Keynes has defined investment as to the increment of capital equipment. According to Stonier and Hague, "By investment we do

not mean purchase of existing paper securities, bonds, debentures orequities but the purchase of new factories, machines and the like."

Joan Robinson defined investment as an addition to capital. It occurs when a new house is built or a new factory is built. Thus invest means making an addition to the stock of goods in existence.

From the above definitions, we have seen that the essence of investment is the net addition to the stock of capital during a specified period. For the purpose of accounting,investment refers to the summation of fixed capital formation and change in inventories during an accounting period. Investment is a flow variable which is always expressed per unit of time.

7.3.2 Types of Investment

Now we are going to discuss about different types or kinds of investments in the following:

- **Gross Investment:** Gross investment is the total amount of expenditure made on new fixed capital goods such as factories, machineries and houses or an addition to the stock of raw materials and consumer goods over a period of time. It includes the expenditure undertaken by both government and private entrepreneurs.

  In an economy, a part of the expenditure is made to maintain economy's productive capacity intact. This type of expenditure is carried out to offset depreciation in the existing productive capacity or obsolesce in machineries or destructions caused by natural calamities. This type of investment is known as replacement Investment. In addition to replacement investment, expenditures are also undertaken on new assets such as purchasing new machines and equipment, construction of new buildings etc.This type of expenditure is carried out to increase existing productive capacity in the economy.So, the net addition to the existing stock of capitalasset and the replacement of

existing depreciated assets by new assets taken togethergivesthe gross investment in the economy. Symbolically it can be expressed as

$I_g = I_n + I_r$

Where Ig represents gross investment and I_n and I_r represents net investment and replacement investment respectively.

- **Net Investment:** Net investment means net addition to the existing stock of capital. This is done to increase productive capacity of existing capital stocks. It involves purchase of new plants, machines and capital equipment, construction of new factory buildings and use of funds on new issues of equities, bonds and securities. Net investment can also be defined as the excess of gross investment over the replacement investment. Symbolically it can be expressed as: $I_n = I_g - I_r$

  Where I_n is net investment. I_g and I_r are gross investment and replacement investment respectively.

  From the above discussion, we can draw following conclusions:

  We know that:

  $I_g = I_n + I_r$. Now,

  - If $I_g > I_r$, it implies that I_n (net investment) is positive and stock of capital will increase equivalent to I_n. In such a situation there would be expansion in the economy.
  - If $I_g = I_r$, it implies that I_n (net investment)=0. It means there is no addition to economy's productive capacity.
  - If $I_g < I_r$, it implies that I_n(net investment) is negative. In this situation communities stock of capital is likely to decrease. As a result there will be contraction in the economy.

- **Private Investment:** Private investment is undertaken by private investors or entrepreneurs. This type of investment is influenced

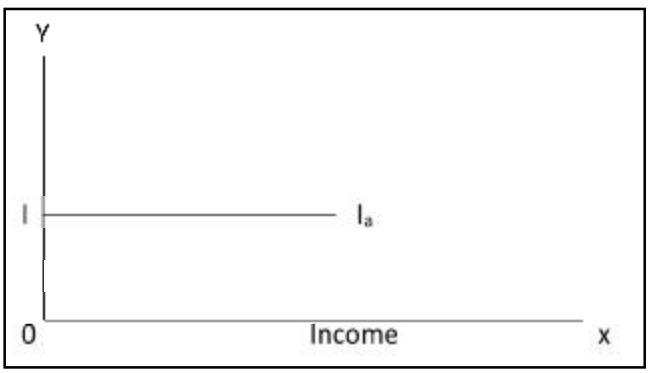
by profit. When there are more expectations about profit, there will be more investment and vice versa.

- **Public Investment:** Public investments are generally undertaken by the government or by some departments of the government. This type of investment is not intended to secure maximum profit, but it is undertaken in consideration with maximum public welfare. Expenditures incurred by the government in respect of railways, road transport, extension of communication,irrigation and power projects, education and public health etc are the examples of public investment.
- **Planned Investment:** When investment is undertaken by the entrepreneur voluntarily in accordance with certain specific plan, then it is known as planned or intended or voluntary or ex-ante investment. For example, if an entrepreneur expects some increase in demand and to meet that he purchases inventories worth`30 lakhs. The expenditure so undertaken is planned or intended or voluntary investment.
- **Unplanned Investment:** If investment is done without any specific plan by the entrepreneur, then it is known as unplanned or unintended investment. In unplanned investment, investors go for investment randomly without making any concrete plans.
- **Autonomous Investment:** Autonomous investment is that investment which is autonomous or independent of changes in the level of income, output or profit of business firms. This type of investment is generally undertakes by central, state or local governments and other public authorities. However, sometime, private business firms may also undertake this type of investment if they want to adopt a long term plan for expansion and modernization. In that case, investment will be executed fully irrespective of the fact that there may be profits or loss in the intervening period. Autonomous investment is generally related to the factors like development of new resources, growth of

population and labour force and technological innovations or inventions like introduction of new products in the market etc.

The autonomous investment curve is shown through Figure: 7.1.

Figure 7.1: Autonomous Investment

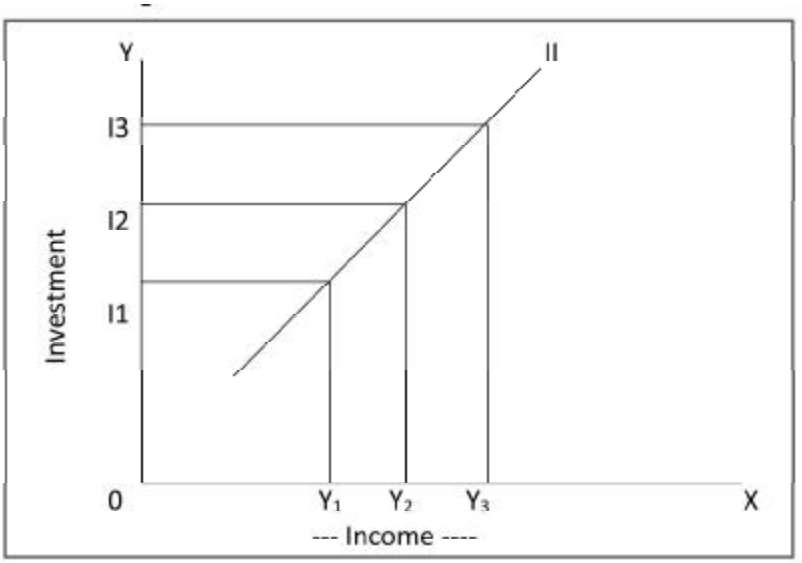


In the figure given above income is measured along the horizontal axis and investment is measured along vertical axis. IAis the autonomous invest curve. This curve is parallel to X-axis. It means that amount of investment remains equal to OI at every level of income and there is no change in investment with the change in income.

- Induced Investment: Induced investment is that investment which varies along with changes in income or profits. If with increase in income or profits there is increase in investment expenditure and with the decrease in income or profits there is decline in investment, then it is known as induced investment. Induced investment is a function of income.

Induced investment curve is shown through Figure: 7.2.

Figure 7.2: Induced Investment



In Fig.2 income is measured along X-axis and investment is measured along Y-axis. II is the Induced investment curve. This is a upward sloping curve. This is because as income increases investment also increases. As it is seen from the figure that when income level is Y1 invest is I1. When income increases to Y2 investment increases to I2 and when income increases to Y3 Investment increases to I3. Thus induced investment shows that there is a direct relationship between income and investment.



CHECK YOUR PROGRESS

Q 1: Distinguish between Gross Investment and Net Investment. (Answer in about 60 words).

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Q 2: Distinguish between Autonomous Investment and Induced Investment. (Answer in about 60 words).

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7.4 MARGINAL EFFICIENCY OF CAPITAL (MEC)

As we have already discussed, the term 'investment' in Keynesian sense is used to mean 'real investment'. Real investment means addition to the existing stock of capital such as new factories, machines, and plants. It is the real investment which brings about addition to income, employment and output. The term Marginal Efficiency of capital was conceived by Keynes and it is related to Real investment only.

7.4.1 Meaning of Marginal Efficiency of Capital (MEC)

In simple words, MEC means expected rate of profitability from a new capital asset. Classical theorist related investment decisions of entrepreneurs to actual rate of profit or rate of return from capital asset over its cost. However, Keynes concept of MEC is in expected terms. The MEC of a particular type of asset is the maximum rate of return over cost expected from an additional unit a capital asset over its life time.

Keynes has defined MEC as "the rate of discount which would make the present value of the series given by the returns expected from the capital asset during its life is just equal to its supply price." Thus if an entrepreneur wants to install a machine, which operates for a series of production periods, he will compare

expected rate of return over its cost or the rate of expected profitability.

7.4.2 Determinants of Marginal Efficiency of Capital

From the above discussion it is clear that there are two determinants of MEC, viz., prospective yield and supply price.

Prospective yield: Prospective yield also known as annual net return or annuities is defined as net annual return expected from new capital assets during its life time. For instance, if an investor installs a new machine which has a life span of 4 years, at the end of each year the machine will yield some return. The net return expected from the machine during its life period after deducting cost of materials and cost of other inputs can be considered as prospective yield of the machine. If R_1, R_2, R_3 and R_4 are the net annual return expected from the machine after deducting other costs, at the end of the 1st, 2nd, 3rd and 4th year respectively, the prospective yield of the machine will be

$$Y=R_1+R_2+R_3+R_4$$

Where Y is the prospective yield, which is the sum of net expected yields or returns expected from a new capital asset.

For determining prospective yield we must consider following points

- Ø Capital asset should be new
- Ø It should be durable
- Ø Only net expected returns should be included
- Ø Prospective yield must include all the yields expected from the capital asset during its life time.

Supply Price: The other determinant of MEC is supply price. It refers to the price at which new unit of a capital asset is supplied. The supply price of an asset is also sometimes referred to as ***replacement cost.*** Replacement cost is the cost involved in



Replacement cost : Replacement cost is the amount of money required to replace an existing asset with an equally valued or similar asset at the current market price.

replacing a depreciated or obsolete capital asset by a new capital asset

By relating these two concepts i.e., prospective yield and supply price we can determine the marginal efficiency of a particularasset.

7.4.3 Measurement of Marginal Efficiency of Capital

We have already discussed about the concept of MEC as defined by Keynes. He defined MEC "as the rate of discount which would make the present value of the series given by the returns expected from the capital asset during its life is just equal to its supply price." If R_1, R_2, R_3…..R_n represents a series of annuities, the present worth of these annuities is computed by discounting them at a certain rate such that the sum of the discounted prospective yields becomes equal to the supply price of the capital asset. This can be expressed as:

Supply price = Discounted prospective yield

The formula for calculation of MEC is given as

$$C_R = \frac{R_1}{(1+i)} + \frac{R_2}{(1+i)^2} + ... + \frac{R_n}{(1+i)^n} \qquad (1)$$

Here C_R represents supply price, R_1, R_2, R_3…..R_n are the prospective yield expected from the capital asset in n periods and i represents rate of discount or the MEC.

The term $\frac{R_1}{(1+i)}$ represents the present value of the annuity or yield to be received at the end of the first year discounted at the rate of r. Assuming rate of discount to be 10 percent, each rupee which is expected one year hence is worth 90.91 paisa now. [This is obtained by dividing re1/- by 1.10]. Thus, 90.91 paisa invested at

10 percent will grow to Re.1/- in one year. Similarly, $\frac{R_2}{(1+i)^2}$ represents the present value of annuity expected at the end of the second year discounted at the rate of r. At 10 percent, each rupee due after two years is worth 82.65 paisa. [This is obtained by dividing Re.1/- by $(1.10)^2$ or 1.21]. This also means that 82.65 paisa invested now at 10 percent will become Re1/- in two years' time.

Now to explain the meaning of MEC as arate of discount we take a simple arithmetic example. Let us suppose that replacement cost or supply price of a particular asset is Rs 3000 and it has alife span of two years. It is further assumed that expected return from the asset during its life span are Rs1250 and Rs 3125 respectively.The unique rate of discount or MEC which equates the prospective yield with supply price is 25 percent. It is obtained by using the formula given above.

$$\text{Rs. } 3000 = \frac{1250}{1+\frac{25}{100}} + \frac{3125}{\left(1+\frac{25}{100}\right)^2}$$

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

In this way discounted prospective yields of a capital asset can be bought into equality to the supply price or replacement cost of the asset. In the above analysis, it is assumed that prospective yields are different for different years. This is practically true for a dynamic society. However, if we assume that prospective yields are same for each year, i.e., $R_1=R_2=R_3$... ... $=R_n$ then the equation given in (1) above can be rewritten as

$$C_R = \frac{R}{(1+i)} + \frac{R}{(1+i)^2} + ... + \frac{R}{(1+i)^n}$$

Let 1+i =x

$$C_R = \frac{R}{x} + \frac{R}{x^2} + ... + \frac{R}{x^n} \qquad ....(2)$$

Multiplying both sides of (1) by 1/x, we have

$$\frac{1}{x} C_R = \frac{R}{x^2} + \frac{R}{x^3} + ... + \frac{R}{x^{n+1}} \qquad ....(3)$$

Subtracting (3) from (2) we have

$$C_R\left(1 - \frac{1}{x}\right) = \frac{R}{x} - \frac{R}{x^{n+1}}$$

$$C_R\left(1 - \frac{1}{x}\right) = \frac{R}{x}\left(1 - \frac{1}{x^n}\right)$$

$$C_R = \frac{\frac{R}{x}}{\left(1 - \frac{1}{x}\right)}\left(1 - \frac{1}{x^n}\right)$$

$$C_R = \frac{R}{(x-1)}\left(1 - \frac{1}{x^n}\right) \qquad .....(4)$$

If n tends to infinity, $\frac{1}{x^n}$ tends to zero. So the above equation becomes

$$C_R = \frac{R}{x = 1}$$

$$\text{or } C_R = \frac{R}{1 + i - 1}$$

$$\text{or } C_R = \frac{R}{i}$$

$$\text{or } i = \frac{R}{CR} .....(5)$$

Equation (5) implies that MEC is the ratio between prospective of additional capital asset and its supply price.

Let us suppose that annual prospective yield over a series of years from a capital asset is expected to be `10000 and its supply price is `.60000, the MEC is estimated as:

$$i = \frac{R}{C_R} = \frac{10000}{60000} * 100 = 16.67 \text{ per cent.}$$

Assuming supply price to be constant if expected annual yield from the capital asset increases to `15000, the MEC will be

$$i = \frac{R}{C_R} = \frac{15000}{60000} * 100 = 25 \text{ per cent}$$

Again let us suppose that annual expected yield from a capital asset is ` 6000and its supply price is ` 40000, then MEC will be

$$i = \frac{R}{C_R} = \frac{6000}{40000} * 100 = 15 \text{ per cent}$$

If expected yield is assumed to be same and that supply price increases to ` 60000 then MEC will be,

$$i = \frac{R}{C_R} = \frac{6000}{60000} * 100 = 10 \text{ per cent}$$

Thus, from the above discussion and examples we can draw the following conclusions:

- Ø Given the supply price there is a direct relationship between annual expected yield and MEC. As expected yield increases MEC also increases and a decrease in expected yield leads to decline in MEC.
- Ø Again given the expected yield, MEC varies inversely with supply price of the capital asset. That means an increase in supply price reduces MEC and decrease in supply price increases MEC.
- Ø So long supply price of the capital asset is more than its expected yield; investors will not go for investment. Investors will think about investing in a project if his net prospective yield is higher than supply price or replacement cost.

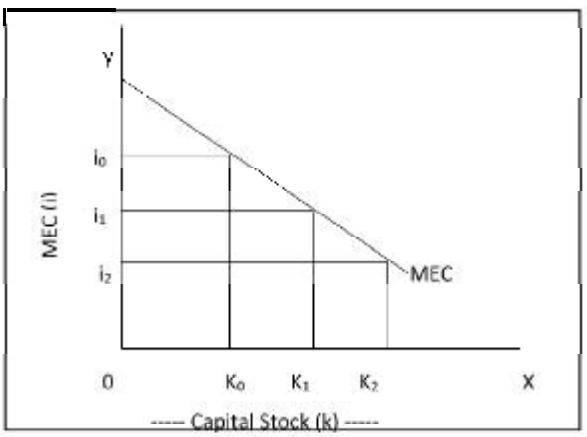
7.4.4 Marginal Efficiency of Capital (MEC) Schedule

Now to see how MEC is affected by volume of capital stock, we have to find out the relationship between MEC and stock of capital. The functional relationship between MEC and stock of capital is called as MEC schedule when the rate of interest and prices of capital assets are given. In the long run, with an increase in the stock of capital, MEC tend to decline due to the following reason:

MEC of an asset will fall as more and more units of that asset are produced. This is justlike as the price of a commodity. Price of a commodity falls when more units of it are put on sale in the market. Similarly, as more and more units of an asset are produced they will compete against each other to meet consumers' demand and in this process their earnings or prospective yields will decline.

Thus, there is an inverse relationship between MEC and stock of capital so that MEC schedule slopes negatively.The MEC schedule is shown with the help of the Figure: 7.3.

Figure: 7.3: MEC Schedule



In the above figure MEC is represented along the vertical axis and capital stock is represented along the horizontal axis. MEC curve is sloping downward showing inverse relationship between MEC and stock of capital. As Stock of capital increases from K_0 to K_1, MEC decreases from I_0 to $I_1$and when stock of capital increases

from K_1 to K_2 respectively, MEC decreases from i_1 to i_2. Here rate of interest and prices of capital asset remains same.

7.4.5 Criticisms of Marginal Efficiency of Capital

Keynes concept of marginal efficiency of capital has been criticized on different grounds:

- Ø Keynes used the term marginal efficiency of capital in many different senses. There is not a fixed meaning of the term which makes it vague and ambiguous. It is pointed out that instead of using the term MEC, he can use the term like marginal productivity of capital or marginal return on capital.
- Ø Keynes had given prominence to the effect of expectations on MEC and he failed to recognize that interest rates were also governed by expectations. In fact, business expectations can very much influenced rate of interest.
- Ø The concept of MEC is also criticized on the ground that its measurement is oversimplified. The two determinants viz., prospective yield and supply price is not very easy to find out. There is no certainty that the expected yields required for calculation of MEC will materialize in practice. Expectations are uncertain and also volatile. They may change drastically in response to the general mood of the business community, news of technical developments, political events, rumours etc. Again the estimation of supply price in the future period is also quite difficult. In such circumstances serious difficulties may arise in the measurement of MEC.
- Ø In analyzing the concept of MEC, Keynes' implicitly assumed conditions of perfect competition in the product and capital market. But such conditions do not exist in real situations. Therefore MEC concept is based on unrealistic assumptions.
- Ø Keynes assumed a constant supply price of capital. This implied that supply of capital is perfectly elastic. However, this is

unrealistic. In reality, as volumes of investment goes up, the demand for capital assets increase which pushes up the. This leads to a fall in the MEC. Thus the actual MEC schedule is likely to be steeper than what is envisaged by Keynes.



CHECK YOUR PROGRESS

Q 3: What is meant by prospective yield? (Answer in about 60 words).

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Q 4: Why does MEC declines in the long run with an increase in the stock of capital? (Answer in about 60 words).

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7.5 MARGINAL EFFICIENCY OF INVESTMENT

So far we have discussed about Marginal Efficiency of Capital. Now we are going to discuss about Marginal Efficiency of Investment.

7.5.1 Marginal Efficiency of Investment (MEI)

Another important concept relating to the investment function is the Marginal Efficiency of Investment (MEI). Please note that the MEI is nothing but MEC when the possibility of increasing supply price

of capital is taken into account. In Keynesian MEC, the supply price of capital is constant. This implies that capital supply is perfectly elastic. But in the real world, capital is scarce. Thus, when the volume of investment increases causing an increase in the demand for capital goods, the supply price of capital goes up. The MEI concept recognises this aspect of capital price. Hence, MEI is an improvement over the concept of MEC as it is far more realistic.

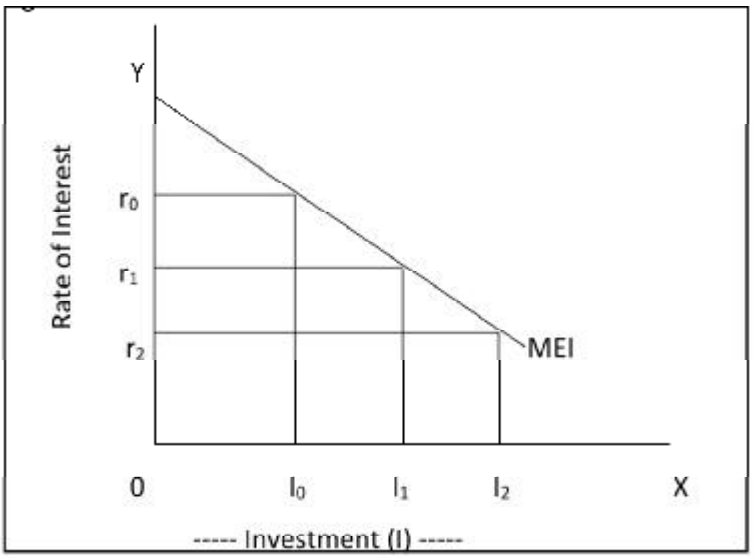
7.5.2 Difference between MEC and MEI

The difference between MEC and MEI is that while the former assumes the supply price of capital to be constant, the latter incorporates the possibility of increase in the supply price of capital as demand for new capital assets go up. But both are expressed as a rate per cent per unit of time, hence both are flows and compatible to rate of interest.

7.5.3 Marginal Efficiency of Investment (MEI) Schedule

The functional relationship between different rates of interest and corresponding amount of investment is known as MEI Schedule. If the price of capital asset increases with the increase demand for capital assets, the MEI schedule depicts an inverse relation between rate of interest and amount of investment.Interest rates represent the cost of borrowing.The lower the rate of interest, it is cheaper for firms to go for investment and the level of investment will rise. Hence, MEI schedule slopes downwards from left to right. It is shown through Figure: 7.4.

Figure 7.4: MEI Schedule



In Figure: 7.4 rate of interest (r)) is represented along vertical axis and investment (I) is represented along horizontal axis. MEI curve is negatively sloped. As rate of interest falls from r_0 to r_1 investment increase from I_0 to I_1. Again when rate of interest further declines from r_1 to r_2 investment increases from I_1 to I_2 respectively. The MEI schedule is also identified as the investment demand Function.

The position and the shape of the MEI curve or investment demand curve plays an important role in determining the volume of investment. Particularly, the elasticity of MEI curve (or, investment demand curve) determines the extent to which the volume of investment would change as a result of the changes in interest. If the MEI curve is relatively interest elastic, a little fall in interest rate results in a considerable expansion in investment. This is shown in the Figure: 7.5. Again if the MEI curve is relatively interest inelastic, a considerable fall in the rate of interest may not lead to increase in the volume of investment. This is shown in the Figure: 7.6

Figure 7.5: Relatively Interest elastic MEI (Investment Demand) Curve

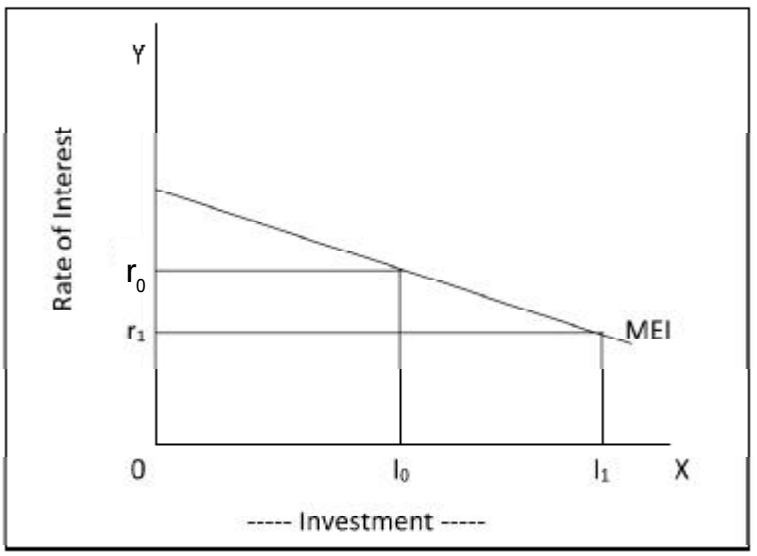


Figure 7.6: Relatively Interest Inelastic MEI (Investment Demand) Curve

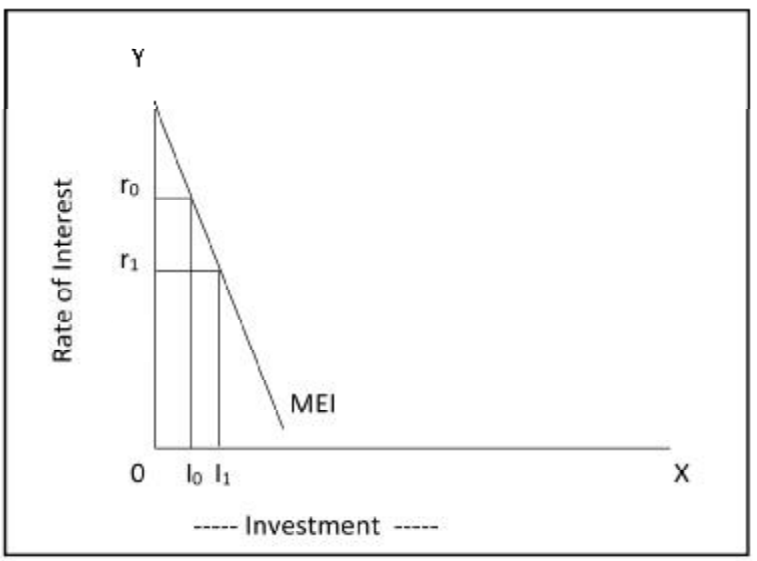


Figure: 7.5 shows that with a fall in the rate of interest from r0 to r1 has resulted in the expansion of investment from I0 to I1, which is more than fall in the rate of interest.

On the other hand, Figure: 7.6 shows that with a fall in the rate of interest from r0 to r1 has resulted in the expansion of investment from I0 to I1, which is less than fall in the rate of interest.

7.5.4 Investment and Rate of Interest

So far we have seen the role of MEC or MEI in determining investment decision of an investor. But, MEC or MEI alone cannot determine private investment. Any investment decision exclusively based on MEC or MEI implicitly assumes that fund is available at zero market rate of interest. Actually this is not true. Therefore, any firm considering for new investment will compare MEC (or MEI) with cost of borrowing the fund or rate of interest. Even if a firm has sufficient fund of its own, then also it will compare whether fund will be used within its own firm and get internal return or lend it to some others to get external return.

The rate of interest according to Keynes, like price of any other thing, is determined by the demand for and supply of money. On the demand side, it is determined by the liquidity preference of the people and on the supply side it is determined by the supply of money available in the economy.

Any investor while going for new investment will very carefully compare between present values (Pv) of the asset with the supply price or replacement cost (CR) of the asset. The present value of an asset is based on the totalyield expected to be realized during the life time of the asset. It is the sum of prospective yields discounted at market rate of interest and it is expressed as follows:

$$P_v = \frac{R_1}{(1+r)} + \frac{R_2}{(1+r)^2} + ... + \frac{R_n}{(1+r)^n}$$

Here, P_v is the present value of the asset. r is the market rate of interest for borrowing funds and R_1, R_2,…….$R_n$is expected receipts. If r is low P_v would be higher and the investor or the entrepreneur will give preference in using funds in their own firms rather thanlending the funds out to others. But this decision is influenced by supply price or replacement cost (C_R). We have already discussed aboutsupply price or replacement cost (C_R). It is expressed as follows:

$$C_R = \frac{R}{(1+i)} + \frac{R}{(1+i)^2} + ... + \frac{R}{(1+i)^n}$$

Here C_R represents supply price, R_1, R_2, R_3.....R_n are the prospective yield expected from the capital asset and i represents rate of discount or the MEC.Given a series of expected receipts (R) following situations may arise:

- When i› r, C_R‹P_v,it means when MEC is more than rate of Interest, the supply price of the asset is less than the present value of the asset. In that situation, entrepreneurs would prefer new investment on fixed capital, provided other endogenous or exogenous factors to be constant.
- When i ‹ r, C_R›P_v, i.e., MEC is less than the rate of interest, the supply price of the asset is more than the present value of the asset. In such a situation, there will be pessimistic situation about investment in new fixed capital assets.Investors may like to invest their funds in financial transactions like purchase of old issues of bonds or shares and there will not be any investment on new fixed capital asset.
- When i = r, C_R=P_v, i.e., MEC is equal to the rate of interest,the supply price of the asset is equal to the present value of the asset. Under such circumstances, there will not be any addition or subtraction in the amount of fixed capital investment.
- With the following hypothetical table: 7.1 we can easily understand the relationship between MEC (i), rate of interest (r) and investment.

Table: 7.1: Relationship between MEC, Rate of interest and Investment

Supply Price (C_R)	Annual Return (R)	MEC (%) (i)	Rate of Interest (%) (r)	Present value (P_v)	Effect on Investment
20000	5000	25	20	25000	Favourable
30000	5000	16.67	20	25000	Unfavourable
25000	5000	20	20	25000	Neutral

From the table given above it is clear that when supply price is Rs. 20000, given constant annual yield Rs. 5000, i is 25 per cent. The corresponding present value, given the market rate of interest 20 per cent, is Rs. 25000. Thus, $C_R < P_v$ or supply price is less than present value.This condition is favourable for positive change in real investment.

When MEC is 16.67 per cent and rate of interest is 20 per cent, corresponding value of supply price is Rs.30000 and value of the asset is Rs. 25000. That means $C_R > P_v$ and this condition is unfavourable for realinvestment.

Again, when MEI is 20 per cent and rate of Interest is also 20 per cent, corresponding value of supply price and present value of asset both are same at Rs. 25000. In such a situation there will not be any addition to real investment or subtraction from it. Thus effect on investment will be neutral.



CHECK YOUR PROGRESS

Q 5: Bring out the differences between MEC and MEI. (Answer in about 60 words).

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Q 6: What is MEI Schedule or Investment Demand Schedule? (Answer in about 60 words).

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7.6 FACTORS AFFECTING MARGIAL EFFICIENCY OF CAPITAL

Now we are going to discuss about the factors that affect marginal efficiency of capital.

- **Propensity to consume:** If the propensity to consume is high, the consumption expenditure will be high or sale of business firms will be high. In such a situation, the MEC will be high. On the other hand, low propensity to consume means low level of consumption expenditure or low level of sales of business firms. Consequently, MEC or expected rate of profitability will be low and volume of investment will decline.
- **Demand for the product:** If the demand for a particular product is expected to be high in the future, the MEC will be high and the level of investment will increase. On the contrary, if the demand for the product is expected to decline in the future, the MEC will be low and consequently, volume of investment will decline.
- **Liquid assets:** If the entrepreneurs have sufficient liquid assets, they can take advantage of the investment opportunities that come in their way irrespective of some rise in the market rate of borrowing. The MEC in such situation will be high. On the other hand, if the entrepreneurs do not have enough liquid assets, they cannot undertake investment unless funds can be procured from the market at lower rate of interest. So a small amount of liquid assets means a relatively lower MEC.
- **Sudden changes in income:** The MEC is also influenced by sudden changes in income of the entrepreneurs. If the business community feels unexpected or windfall gains can become available to them, or there are tax concession etc., the MEC will be high and hence investment in the country will go up. On the other hand, when there is the possibility of unexpected or windfall losses MEC decreases and investment gets depressed.

- **Existing stock of capital:** If the existing stock of capital goods is quite large in the country, it means that opportunities for investment are less. In such a situation expected rate of profit or MEC will be low. On the other hand, if the existing stock of capital is very small, the investors have more profitable opportunities for investment and MEC is likely to be high.
- **Wave of optimism and pessimism:** The marginal efficiency of capital is also affected by waves of optimism and pessimism in the business circle. If the investors or entrepreneurs are optimistic about future, they start raising investment and MEC rises. On the other hand, if they are pessimistic, they will not raise investment and MEC will be low.
- **Rate of growth of population:** The rate of growth of population in a country has a significant effect on MEC and investment in the long run. If the population of a country grows rapidly, there will be rapid increase in the demand for all types of consumption goods as well as investment goods. Consequently there will be large investment opportunities and MEC will also be high. On the other hand, a declining population will discourage investment and thus reduce marginal efficiency of capital.
- **Technological development:** If there is improvement in the production techniques or new innovations and inventions are taking place in a country, the producers will employ new techniques in various industries. As a result, it will create investment opportunities and MEC will be high. Productive capacity of existing capital equipment: If the existing capacity of an industry is not fully utilized or if a part of the installed capital is lying idle, then any increase in the demand for the product of that industry can be met by utilizing the unutilized existing capacity. Hence there would be no fresh investment in that industry. In this situation MEC will be low. On the other hand, if the existing capacity of the particular industry is fully utilized, the increased demand for the product will be met by installing new capital equipment in the industry. This requires fresh investment and MEC will also be high.
- **Extent of market:** Size of the domestic market also determines MEC. If the size of the domestic market is large, it gives huge investment

opportunities and consequently expected rate of return or MEC will also be high. On the contrary, if the size of the domestic market is small, there will be limited opportunities for investment and expected rate of return or MEC will be low.

- **Development of new areas:** If in a country, developmental activities such as development of transport and communication, power and irrigation are extended to some new areas or regions; it gives considerable scope to the investors to invest in these areas. In such a situation, MEC will definitely be high.
- **Foreign trade:** If a country has large export market, then it increases the opportunity for the investors to invest in export oriented goods and expected rate of profit or MEC too is high and vice versa.
- **Economic policy of the government:** Long run economic policy of the government also influences MEC. If economic policy of the government involves more taxation, reduction in subsidies, excessive controls and restriction on prices, profits, investments, imports etc. investment will be discouraged and MEC will be low. On the other hand, if the government policies assure tax reduction and relaxation of controls, investment activities will be encouraged and MEC will be high.



CHECK YOUR PROGRESS

Q 7: State whether following statements are True (T) or False (F).

(i) If the propensity to consume is high, the MEC will be high. (T/F)

(ii) If the existing capacity of an industry is not fully utilised, MEC will be high. (T/F).



7.7 LET US SUM UP

- Investment in general means the net addition to the stock of capital during a specified period.

- Gross investment is the total amount of expenditure made on new fixed capital goods such as factories, machineries and houses or an addition to the stock of raw materials and consumer goods over a period of time.
- Net investment means net addition to the existing stock of capital.
- Private investment is undertaken by private investors or entrepreneurs. This type of investment is influenced by profit.
- Public investments are generally undertaken by the government or by some departments of the government. This type of investment is not intended to secure maximum profit.
- Investment undertaken by the entrepreneur voluntarily in accordance with certain specific plan is known as Planned Investment.
- If investment is done without any specific plan by the entrepreneur, then it is known as unplanned or unintended investment.
- Autonomous investment is that investment which is autonomous or independent of changes in the level of income, output or profit of business firms.
- Induced investment on the other hand is the investment which varies along with changes in income or profits.
- MEC means expected rate of profitability from a new capital asset. According to Keynes MEC is the rate of discount which would make the present value of the series given by the returns expected from the capital asset during its life is just equal to its supply price.
- There are two determinants of MEC:Prospective yield and Supply price.
- Prospective yield also known as annual net return or annuities is defined as net annual return expected from new capital assets during its life time.
- Supply price refers to the price at which new unit of a capital asset is supplied. The supply price of an asset is also sometimes referred to as replacement cost.
- Given the supply price, there is a direct relationship between annual expected yield and MEC.
- Again when the expected yield is given, MEC varies inversely with supply price of the capital asset.

- So long supply price of the capital asset is more than its expected yield; investors will not go for investment. Investors will think about investing in a project if his net prospective yield is higher than supply price or replacement cost.
- The functional relationship between MEC and stock of capital is called as MEC schedule. In the long run, with an increase in the stock of capital, MEC tend to decline
- MEI concept is related to investment in new project.MEI is defined as the unique rate of discount which equates the present values of annuities expected from the given investment in the new project to the cost of financing the project.
- If cost of the project is given, there is direct relationship between MEI and expected yields.
- Given the expected returns or yield of the project, MEI varies inversely with cost.
- The difference between MEC and MEI is that while the former assumes the supply price of capital to be constant, the latter incorporates the possibility of increase in the supply price of capital as demand for new capital assets go up. But both are expressed as a rate per cent per unit of time, hence both are flows and compatible to rate of interest.
- The functional relationship between different rates of interest and corresponding amount of investment expresses MEI Schedule. If the price of capital asset increases with the increase demand for capital assets, the MEI schedule depicts an inverse relation between rate of interest and amount of investment.
- Other than MEC or MEI, the rate of interest is also one of the major determinants of Investment. .Any firm considering for new investment will compare MEC (or MEI) with cost of borrowing the fund or rate of interest.
- Some of the important factors that affect MEC are : demand for the product, propensity to consume,liquid assets, sudden changes in income, existing stock of capital, wave of optimism and pessimism, rate of growth of population, technological development, productive capacity of existing

capital equipment, extent of market development of new areas, foreign trade, and economic policy of the government.

7.8 FURTHER READING

1) Ahuja, H.L. (2016). Macroeconomics. Agra: Laxmi Narayan Agarwal Educational Publishers.
2) Bhaduri, Dr. S. (2012). Macro Economics. Guwahati: New central Book Agency (P) Ltd.
3) Mukherjee S. (2013). Macro Economics: A Global Text. Guwahati: New central Book Agency (P) Ltd.
4) Rana, K.C. & Verma, K.N. (2017). Macro Economic Analysis. Jalandhar: Vishal Publishing Co.
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7.9 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: Gross investment is the total amount of expenditure made on new fixed capital goods by both government and private entrepreneurs. So the net addition to the existing stock of capital asset and the replacement of existing depreciated assets by new ones taken together gives the gross investment in the economy.

On the other hand, net investment means net addition to the existing stock of capital. Thus, net investment is the excess of gross investment over the replacement investment.

Ans to Q No 2: Autonomous investment is autonomous or independent of changes in the level of income, output or profit of business firms. This type of investment is generally undertaken by central, state or local governments and other public authorities and sometimes by private business firms.

Induced investment, on the other hand, varies along with changes in income or profits. In fact, Induced investment is a function of income or profit.

Ans to Q No 3: Prospective is defined as net annual return expected from new capital assets during its life time. If R_1, R_2, R_3 and R_4 are the net annual return expected from the machine, at the end of the 1st, 2nd, 3rd and 4th year respectively, the prospective yield of the machine will be

$Y=R_1+R_2+R_3+R_4$.

Here, Y is the prospective yield, which is the sum of net expected yields orreturns expected from a new capital asset.

Ans to Q No 4: In the long run, with an increase in the stock of capital, MEC tend to decline due to two reasons. Firstly, as more and more units of an asset are produced they will compete against each other to meet consumers' demand and in this process their earnings or prospective yields will decline.Secondly, along with the decline in the prospective yield, the supply price of such an asset is likely to go up if more and more units of that asset are produced because of the application of the law of diminishing returns resulting increase in the marginal cost of producing these assets.

Ans to Q No 5: Differences between the MEC and MEI are:

- MEC is related to expected returns from investment in new capital asset whereas MEI is related to expected returns from investment in new project.
- MEC is a stock concept, while MEI is a flow concept.
- MEC determines the optimum capital stock in an economy at each level of interest rate.On the other hand, given the capital stock, MEI determines the net investment of the economy at each interest rate.

Ans to Q No 6: The functional relationship between different rates of interest and corresponding amount of investment, when MEC is givenis known as MEI schedule or investment demand schedule. If the price of capital asset increases with the increase demand for capital assets, the MEI schedule depicts an inverse relation between rate of interest and amount of investment. The lower the rate of interest,

it is cheaper for firms to go for investment and the level of investment will rise.

Ans to Q No 7: (i) True (ii) False



7.10 MODEL QUESTIONS

A) Very Short Questions (Answer each question in about 75 words)

Q 1: Define financial investment?

Q 2: What is the difference between Replacement investment and Net investment?

Q 3: Show the relationship between MEC, Prospective yield and Supply price?

B) Short Questions (Answer each question in about 250 words)

Q 1: Define the concept of MEI. Explain the relationship between cost of the project, MEI and expected yields?

Q 2: Examine the role of Rate of interest in determining investment.

C) Long Questions (Answer each question in about 300-500 words)

Q 1: Define MEC. Explain its determinants.

Q 2: What is MEC schedule? Why MEC tend to decline with an increase in the stock of capital?

Q 3: Define MEI Schedule? Show how the position and the shape of the MEI curve plays an important role in determining the volume of investment?

Q 4: What is investment? Explain different types of investment.

Q 5: Make a clear distinction between (i) Gross and Net Investment, (ii) Financial and Real Investment and (iii) Autonomous and Induced Investment.

Q 6: Discuss various long run and short run factors affecting MEC.

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